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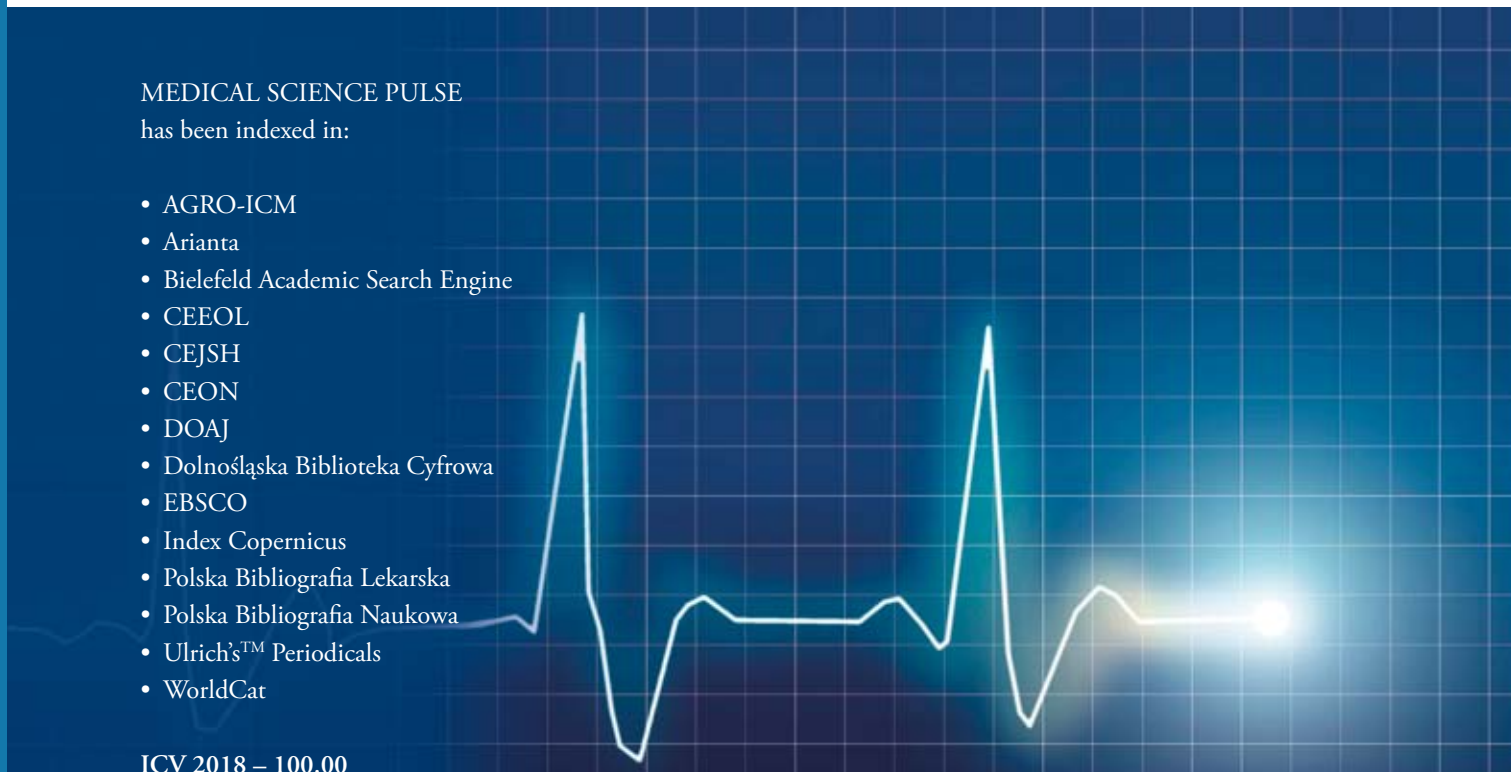

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Ladies and Gentlemen, Faculty, Graduates and Students of Universities, Readers and Enthusiasts of *Medical Science Pulse*!

Medical Science Pulse quarterly is an e-only journal (e-ISSN 2544-1620), available as an Open Access title under Creative Commons licenses. The quarterly has been added to the list of scientific journals of the Ministry of Science and Higher Education, with a score of 20 points in 2019! *Medical Science Pulse* is the only scientific journal in the field of medical sciences and health sciences on this list in the Opolskie Voivodeship.

We always encourage our readers, students, graduates, young scientists and researchers from various institutions to publish their scientific papers in English in *Medical Science Pulse*. It is an excellent way to add to your academic achievements, even for early stage researchers such as students wishing to present doctoral thesis findings or even theses with the use of high-quality diploma dissertations. It is also a chance to be cited by other researchers. We guarantee high editorial quality, a standardized review process and compliance with ethics rules. Moreover, we offer workshop support for the preparation of articles and English editorial proofreading by a native speaker and medical sciences specialist. We do not charge authors any fees and the works are published as Open Access under Creative Commons licenses, which allows your texts to reach a world-wide audience. Detailed information can be found at: https://medicalsciencepulse.com/resources/html/cms/MAINPAGE

The *Medical Science Pulse* editorial team would like to draw your attention to new functionalities on the journal's website. These are designed to enable potential authors to submit manuscripts well-suited for our journal. We have prepared three checklists: STROBE Statement – a checklist of items that should be included in reports of observational studies; CONSORT – transparent reporting with regard to clinical trials; and PRISMA – transparent reporting on systematic reviews and meta-analyses. These checklists are best practice guidelines for manuscript preparation and serve as a final note before submitting manuscripts and evidence-based standards for reporting in scientific papers. The website provides information that may help authors prepare their manuscripts and submit them to the MSP journal: https://medicalsciencepulse.com/resources/html/cms/MYMANUSCRIPTS.

The second issue has many original papers with studies focusing on an assessment of various aspects of using protocols in intensive care units in Bulgaria, rehabilitation of patients with ischemic heart disease following myocardial revascularization in Ukraine, determinants of developing a pilot of coordinated care model for patients with multiple sclerosis in Poland, problem of upper gastrointestinal bleeding as a life-threatening condition, the role of primary care physicians and nurses in convincing patients to participate in a colorectal cancer screening program, the influence of fear of death on selected dimensions of body image, content of selected mineral ingredients of menus from social welfare home, an assesment of body posture of children aged 3-6 years and intergenerational differences in the body build of women. In the Case Reports section, please note the article entitled: The use of combination therapy with 20% glycolic acid and fractional mesotherapy to reduce acne scars and in the Review section an interesting paper from India on benefits of hormone replacement therapy for post-menopausal women.

We would like to thank you for another academic year full of intense academic work and wish you all unforgettable summer experiences, safe travel, relaxation and fruitful time spent with your issue of *Medical Science Pulse*!

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Original papers

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ASSESSMENT OF VARIOUS ASPECTS OF USING PROTOCOLS IN INTENSIVE CARE UNITS IN PLOVDIV, BULGARIA

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A – study design, **B** – data collection, **C** – statistical analysis, **D** – interpretation of data, **E** – manuscript preparation, **F** – literature review, **G** – sourcing of funding

ABSTRACT

Background: Since 1950 intensive care has become a separate and independent specialty. Significant technological advances have allowed the Intensive Care Unit (ICU)[s] to be monitored through the centralized work of a multidisciplinary team of specialists. ICUs provide cares at different levels of support. To provide patient access to this highly specialized cares, the "Critical care without walls" or "Intensive Care without Borders" theories have emerged, involving reanimation nurses offering highly specialized care and support. Protocols for nurses have been developed, with the aim of facilitating their day-to-day activities, improving outcomes and safety of patients and all staff. Utilizing this concept, the role of intensive care has rapidly expanded over the past 20 years.

Aim of the study: To understand the effectiveness and benefits derived from organisation of the working process.

Material and methods: We used documentary and survey methods and analysed the data using the software package SPSS v. 21.0. Graphics were prepared using Microsoft Excel 2013. Numbers from 1 to 5 refer to the answers "no", "not really", "cannot judge", "closer to yes" and "yes", respectively.

Results: Nurses' performance, as an integral part of multidisciplinary ICU teams, is evidence that mortality and morbidity can be improved thanks to the early recognition of patient deterioration and rapid resuscitation. The better healing process is accomplished by optimising the content and evaluation of the desired results, in association with good doctor practices. Respondents' opinions about outcomes of protocol use differed significantly between professions in regard to making their job easier, improving patient outcomes, providing consistency in care, and preventing patient harm.

Conclusions: A more flexible and standard framework for nurses should be developed to improve quality of care. The rapidly growing lack of ICU nurses in Bulgaria is concerning.

KEYWORDS: protocols, cares, ICU[s], nurses

Background

Intensive units provide care at different levels of support for intensive patients [1]. To provide patients with this highly specialized type of care, the "Critical care without walls" or "Intensive Care without Borders" theory has emerged, in relation to reanimation nurses offering highly specialized care and support [2–5]. Protocols for the work of nurses, with the aim of facilitating their day-to-day activities, have been developed to improve outcomes and safety of patients and all staff [6–10]. Following this concept, the role of intensive cares has been rapidly expanded over the last 20 years [11,12]. The performance of nurses, as an integral part of multidisciplinary teams in ICUs is evidence that mortality and morbidity can be improved thanks to the early recognition of patient` deterioration and rapid resuscitation [13,14]. We wished to study their effectiveness and the benefits for the organization of the working process [15,16].

Aim of the study

To assess ICU nurses' activities' effectiveness and the benefits of organizing the working process.

Material and methods

We used documentary and survey methods and analysed the data using the software package SPSS v. 21.0. Graphics were prepared using Microsoft Excel 2013. Numbers from 1 to 5 refer to the answers "no", "not really", "cannot judge", "closer to yes" and "yes", respectively.

Results

We conducted a survey (shown in fig. 1) of 94 (Sp = 3.74 ± 52.81%) respondents on the use of work protocols as one of the ways of limiting clinic costs. 42 (Sp = 3.18 ± 23.60%) responded with full agreement to this statement. Around 20 (Sp = 2.37 ± 11.24%) of the respondents believed it was impossible ($c^2 = 27.51$, $p < 0.05$, df = 2).

Fig. 2 shows that compliance allows a faster and more efficient process of healing according to 57 respondents (Sp = 3.50 ± 32.02%). 113 (Sp = 3.61 ± 63.48%) have a rather positive opinion ($c^2 = 8.67$, $p = 0.013$, df = 2).

The majority (Sp = 3.74 ± 52.81%) of the specialists (94) felt that the use of protocols contributed to the elimination of mistakes in the administration of drug therapy (fig. 3). A large proportion (55) (Sp = 3.46 ± 30.90%) gave an entirely positive answer to this statement, while the rest (9) (Sp = 1.64 ± 5.06%) were uncertain, and 18 (Sp = 2.26 ± 10.11%) stated that it would not make much difference ($c^2 = 12.94$, $p = 0.002$, df = 2).

Discussion

Protocol use has substantially increased over the past decade. Patient outcomes associated with protocol use have typically demonstrated positive results [1–11]. This is the first study to study the views of interdisciplinary, critical care clinicians in the development, implementation, assessment, and perception of utility of protocols. This information will be useful for institutions developing such protocols and for those institutions encouraging compliance with existing protocols. Both professions indicated that the most important advantage of protocols was improved patient outcomes. Protocol implementation has been demonstrated in the literature to improve mortality and morbidity outcomes [12–14]. Sedation protocols have been shown to decrease the duration of mechanical ventilation and length of stay in hospital [5]. Protocols managing transfusion management, sepsis resuscitation, and ventilator-associated pneumonia have also shown improved outcomes [8,15,16]. Drug protocols were identified as the most frequently used protocol to improve patient outcomes. This is supported by a recent analysis showing that incorporating "sepsis bundles" improved antibiotic use among the heterogeneous studies [16].

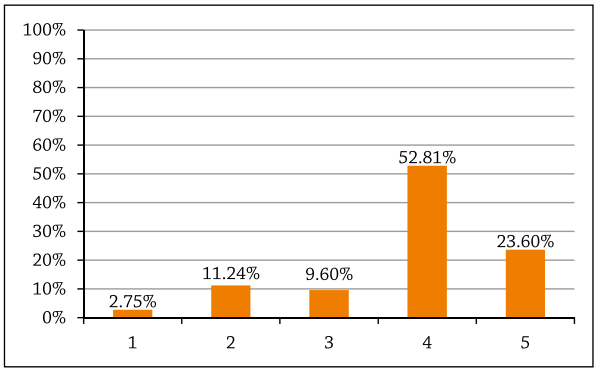

Figure 1. Use of protocols can limit clinic costs.

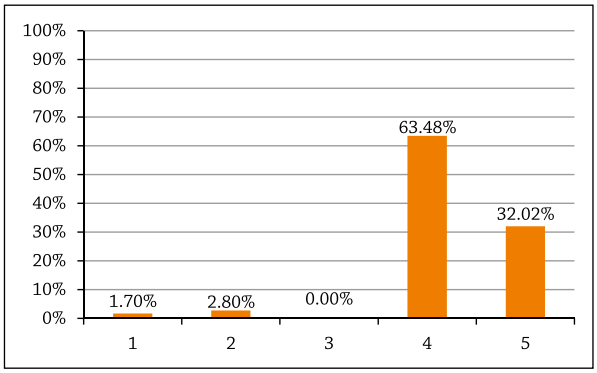

Figure 2. Protocol compliance permits faster and more efficient healing and diagnosis.

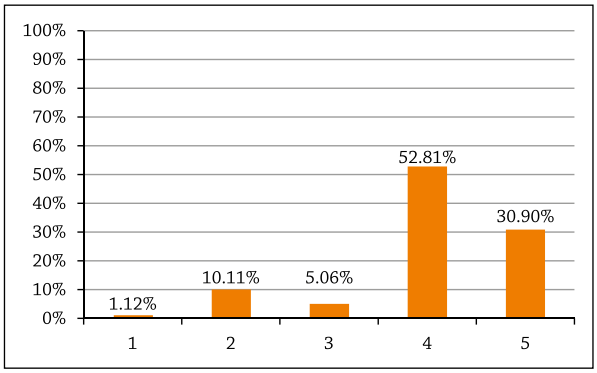

Figure 3. Protocols contributed to the elimination of mistakes in drug administration.

Conclusions

1. The performance of nurses, as an integral part of multidisciplinary teams in ICUs, is evidence that mortality and morbidity can be improved thanks to the early recognition of patient` deterioration and rapid resuscitation.
2. Improved healing can be accomplished by optimizing the content and evaluation of the desired results, in association with good doctor practices.
3. Ultimately, flexible frameworks for accepted standards of service must be developed, allowing staff to be audited and improving quality of work.

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Original papers

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REHABILITATION OF PATIENTS WITH ISCHEMIC HEART DISEASE FOLLOWING MYOCARDIAL REVASCULARIZATION

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A – study design, **B** – data collection, **C** – statistical analysis, **D** – interpretation of data, **E** – manuscript preparation, **F** – literature review, **G** – sourcing of funding

ABSTRACT

Background: Rehabilitation of patients following myocardial revascularization remains major problem in today's world. Through psychological support and training, it is possible to develop a positive attitude to health and illness, optimize an individual's inner health perception, and improve a person's self-image as healthy and their knowledge of how to maintain that health.

Aim of the study: To examine new rehabilitation interventions for patients following myocardial revascularization.

Material and methods: 60 patients were reviewed following myocardial revascularization, using clinical-anamnestic, instrumental methods, assessment of quality of life, cognitive therapy and physical rehabilitation. Rehabilitation of the patients was performed using the author's program "Psychological rehabilitation of patients with ischemic heart disease and myocardial infarction by optimization of the inner picture of health".

Results: Training by optimization of the patients' inner picture of health leads to a reduction in the manifestations of anxiety and depression, improves subjective and objective indicators, quality of life, and changes the patient's attitude to illness. At the beginning of the observation period, there were subclinical signs of anxiety in the majority of patients, with an average score of 11.23±0.70. During the course of treatment, there was a decrease in the mean score of anxiety in the group receiving suggestive therapy of 7.58±0.69 (22.6%), and in the group using of optimization of IPH there was a decrease of 7.69±0.63 (30.8%). A reduction in manifestations of depression was found, from 8.89±0.64 at the beginning of treatment to 7.65±0.51 after 1 month of the treatment. For patients participating in the optimization of IPH program, the average score was 8.85±0.65 and 6.85±0.49, respectively. In terms of indices of quality of life, after 6 months an increase in most scales was noted. The use of suggestive therapy contributed to a gradual decrease in volumetric indices of LV EDV, from 135.61±10.66 cm^3 at the beginning of the observation to 108.90±5.98. During the same period of observation, there was a decrease in the values of EDD and ESD and a significant increase in EF from 49.65±1.93% to 55.29±1.88.

Conclusions: In order to maximize the benefits of rehabilitation, it is important to develop strategies for the optimization of the inner picture of health. A change in attitude to disease leads to an improved perception of the patient to health, motivation for treatment, and the need for active participation in rehabilitation interventions.

KEYWORDS: ischemic heart disease, aortocoronary bypass, rehabilitation, suggestive therapy, inner picture of health

Background

Ischemic heart disease (IHD) remains a major problem in today's world. Surgical revascularization of the myocardium, in particular, aortic coronary artery bypass graft (CABG), is an important treatment for patients with IHD. Every year, CABG techniques are improving [1,2].

Compulsory components of cardiac surgery are multidisciplinary rehabilitation that require active collaboration between patient and specialist, as well as targeted and disciplined approaches to the patient's behavior (to change his/her behavior), lifestyle and levels of physical activity [3].

Many researchers have found that, in patients with cardiovascular disease, there is a psychological component. Often, there are emotional disorders such as anxiety and depression. Patients live with constant fears of recurrence of IHD, become over-focused on cardiac

activity, reacting to the least unpleasant sensations in the area of the heart. Heart health becomes the main focus of their lives [4].

The inner picture of health (IPH) is a multi-dimensional system in which various components of human health are represented including physical, psychological, social and spiritual. The IPH model consists of the following components; sensory, emotional, cognitive, value-motivational and behavioral [5].

The ability to see disease only as part of health is a strategy for self-preservation and self-rehabilitation. Quality of life in patients after cardiac surgery is not only effected by physical symptoms, but by limited activity, social support and participation, as well as personal perceptions [6,7].

Therefore, it is important to develop a positive, conscious attitude to health and disease, with the construction of an optimal IPH through psychological support and training. Psychological support is an integral part of the rehabilitation program, with the special attention being paid to the interaction between the doctor and the patient [8,9].

Aim of the study

To examine new rehabilitation interventions for patients following myocardial revascularization.

Material and methods

Study design

60 patients with IHD who had CABG were reviewed, using the following assessments and treatments: clinical-anamnestic, diagnostic, instrumental, psychometric (HADS), assessment of quality of life, suggestive therapy and education through IPH optimization.

Depending on the type of rehabilitation employed, the patients were respectively divided into 3 groups, 20 patients in each group. Patients in group I received traditional therapy. Patients in group 2 received suggestive therapy in addition to traditional therapy. Patients in group 3 received training in the optimization of IPH following the "Program of clinical-psychological rehabilitation of cardiologic patients by optimization of the inner picture of health".

Methods

To assess the psycho-emotional state of the patients, the Hospital Scale of Anxiety and Depression (HADS) was used. According to the scale, results patients were divided into groups with absence of symptoms of anxiety/depression (0-7 points), subclinical anxiety/depression (8-11 points) and clinical anxiety/depression (points more 11 than).

Quality of life was assessed using to the "Seattle Angina Questionnaire – SAQ" and its scales "Physical Limitation-PL", "Stability of Angina Pectoris-AS", "Angina Frequency-AF", Treatment Satisfaction-TS and Disease Perception-DP. Depending on the answer to the questions, quality of life was rated on a scale of 1 to 5.

Cardiac and systemic hemodynamics were studied by echocardiography using the "CARIS-PLUS" apparatus ("Biomedice", Italy). The size of the left atrium (LA), the size of the left ventricle (LV) in systole (ESD) and diastole (EDD), the thickness of the interventricular membrane (TIM) and the posterior wall (PW) of LV in diastole were determined. The discharge fraction (DF) of LV, stroke volume (SV), end-diastolic volume (EDV), end-systolic volume (ESV) were calculated. In all three groups, observations were performed at admission, after 1 month and after 6 months.

Setting

Traditional treatment included a medical component (both pharmacological and non-pharmacological) and a physical component. Suggestive therapy was an autotraining intervention with music therapy every other day for 20 minutes, with classes held in the wards.

The training of patients was performed using the author's program "Psychological rehabilitation of patients with ischemic heart disease and myocardial infarction by optimization of the inner picture of health", which included 5 interactive exercises with a duration of 60 minutes. Classes, performed by a cardiologist and a psychologist, were constructed taking into account components of the IPH, with each component considered as a separate lesson. Classes were cyclic, groups were open, and each patient could join the group during the activity without losing the training logic. During the course of the program, patients completed diaries in which, after each lesson, they recorded changes that took place [10].

Statistical processing was performed using "Microsoft Excel" and "Statistica" v. 10.0 StatSoft, USA. The assessment of the probability of the difference in mean values was performed using the Student paired t-criterion. Mean values are given as (M±m), where M – is the mean value of the indicator, m – is the standard error of the mean. The results were considered statistically significant at a value of $p < 0.05$. Before conducting the comparative analysis (or descriptive statistics), it was observed that the experimental data corresponded to the normal distribution law. Verification was performed using Kolmogorov-Smirnov criteria.

Results

Analyzing the clinical-anamnestic data of patients who had CABG, it was observed that the average age was 63.42±1.52 years, and there were both city and village patients. The majority of patients were people with AH of the II degree. 26.67% had a history of type II diabetes mellitus, the majority of patients had signs of CHF of the IIIA degree, and manifestations of acute heart failure (tab. 1).

A level of anxiety (HADS) corresponding to subclinical anxiety was found in most patients, and was the

Table 1. Clinical-anamnestic characteristics of patients who were performed CABG.

Index		Patients who were performed CABG (n = 60)	
		n	%
Average age, years		63.42±1.52	
Gender:	female	22	36.67
	male	38	63.33
Residents of the city		34	56.67
Residents of the village		26	43.33
Without AH		-	-
AH I		-	-
AH II		40	66.67
AH III		20	33.33
DM II type		16	26.67
Without CHF		-	-
CHF I		9	15.00
CHF IIA		38	63.33
AHF according to Killip I		-	-
II		3	5.00
III		2	3.33
IV		3	3.33
Notes:	1. The absolute number of patients is indicated. 2. The percentage to the absolute number of the examined patients is represented in brackets		

groups in 45.0%, 50.0%, 30.0% respectively in groups 1, 2 and 3 and clinical anxiety was found in 40.0%, 35.0%, 45.0%, respectively in groups 1, 2 and 3 with an average score of 11.23±0.70. After 1 month, there was a decrease in the percentage of patients with clinical manifestations of anxiety, and an increase in patients with a lack of severe symptoms of anxiety. There was also a decrease in the mean score of anxiety in the group receiving suggestive therapy 7.58±0.69 at 22.6%, and in group receiving optimization of IPH 7.69±0.63 at 30.8%. After 6 months in the group receiving suggestive therapy and the optimization of IPH, these indices were significantly higher ($p < 0.01$). Dynamics of indices of depression according to the scale of HADS in patients who underwent CABG are presented in tab. 2.

When analyzing quality of life at admission to the hospital, in all groups of patients low values of limitation of physical activity were noted. In groups 1, 2 and 3, these values were 38±4%, 37±4% and 35±4%, the stability of angina Pectoris (AS) was 36±7%, 34±6% 36±7%, the angina frequency (AF) was an average 29±5%, and there was a low index of disease perception (DP). After 6 months, an increase in the indices according to most scales was noted. However, the most pronounced changes in the index regarding the disease perception (DP) were in the groups receiving the suggestive therapy intervention and optimization of IPH from 30±4%, at admission to 79±5% after 6 months of observation (fig. 1)

Among patients with SCAD after CABG who had traditional treatment, only a tendency to decrease ($p > 0.05$) of volume and metric indices of the left ventricle was

Table 2. Dynamics of indices of depression (HADS) in patients who were performed CABG.

Index, units of measure		At admission to the hospital	1 month	6 months
Traditional treatment (n = 20)				
Manifestations of depression:	– absence of symptoms	7 (35.0%)	9 (45.0%)	11 (55.0%)
	– subclinically expressed	8 (40.0%)	7 (35.0%)	6 (30.0%)
	– clinically expressed	5 (25.0%)	4 (20.0%)	3 (15.0%)
Mean score of depression		8.91±0.65	7.70±0.61	6.68±0.59
Δ			-13.5	-25.0
Traditional treatment with suggestive therapy (n = 20)				
Manifestations of depression:	– absence of symptoms	8 (40.0%)	13 (65.0%)	15 (75.9%)
	– subclinically expressed	8 (40.0%)	4 (20.0%)	3 (15.0%)*
	– clinically expressed	4 (20.0%)	3 (15.0%)	2 (10.0%)
Mean score of depression		8.89±0.64	7.65±0.51	6.45±0.46*
Δ			-14.1	-27.5
Traditional treatment with IPH optimization (n = 20)				
Manifestations of depression:	– absence of symptoms	7 (35.0%)	14 (70.0%)	16 (80.0%)*
	– subclinically expressed	9 (45.0%)	4 (20.0%)	3 (15.0%)*
	– clinically expressed	4 (20.0%)	2 (10.0%)	1 (5.0%)
Mean score of depression		8.85±0.65	6.85±0.49	5.97±0.44**
Δ			-22.6	-32.5
Notes:	1. The reliability of the difference between the indices compared with the values before treatment: * < 0.05; ** < 0.01. 2. Δ – percentage of increase (+)/decrease (-) in comparison with the values before treatment.			

observed. At the same time, there was no significant increase in EF during the 6 months of treatment (fig. 2).

Suggestive therapy contributed to a gradual decrease in volumetric indices of LV. Both EDV and ESV were reduced during treatment, but these indices became reliable only after 6 months of treatment. For example, EDV was 135.61±10.66 cm^3 at the beginning of observation, but it reduced after the 6-month treatment period up to 108.90±5.98 ($p < 0.05$). The program resulted in a decrease in EDV after 6 months of treatment to 19.9% ($p < 0.05$), ESV – at 24.9% ($p < 0.05$) and an increase in EF at 10.45, only after 6 months of observation ($p < 0.05$).

Discussion

The CROS study documented the effectiveness of cardiac rehabilitation in the reduction of mortality after coronary artery bypass surgery, and rehabilitation into a "new era" of finding ways to improve outcomes in patients with various manifestations of IHD is a subject of ongoing debate [11].

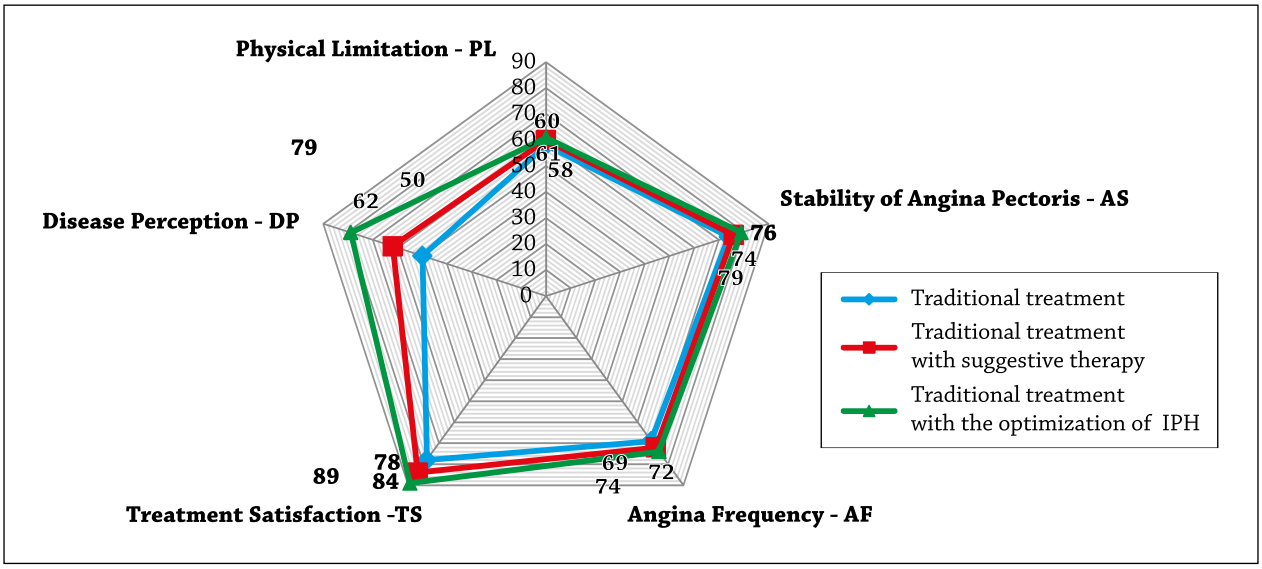

Figure 1. Dynamics of life quality of patients, who were performed CABG after 6 months.

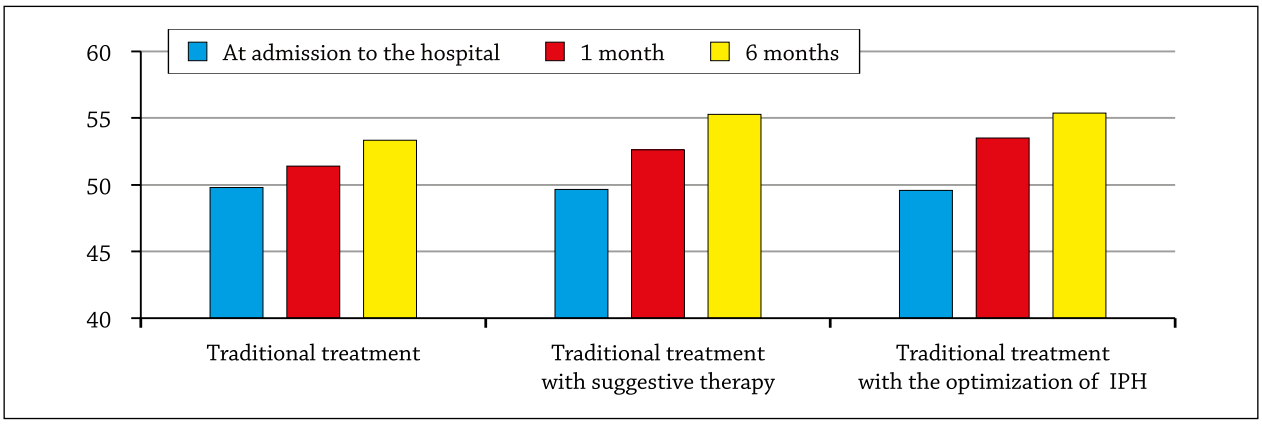

Figure 2. Dynamics of EF of LV in the process of observation.

Reasons for reductions in the quality of life of in patients are age, individual-psychological differences, as well as social factors and attitude towards disease. Differentiation of these factors will allow for the development of programs for rehabilitation of patients, taking into account influencing factors of and involvement of relevant specialists [12].

Our data, on the one hand, indicate that, in patients after myocardial revascularization, there is a cascade of restorative pathogenetic changes. These include coronary bed restructuring, changes in adaptation to chronic ischemia and processes of reoxidation, changes in central and peripheral hemodynamics and, as a result, improvement of peripheral and cerebral blood flow. In addition, there is a significant increase in the tolerance to physical activity and cardioprotection in general.

This cascade of restorative processes improves quality of life and promotes correction of the psychosomatic component of the patient's condition.

Another side of this process is the growing commitment of the patient to effective physical and social rehabilitation. Psychological adaptation is an important component of rehabilitation.

The "Program of clinical-psychological rehabilitation of cardiologic patients by optimizing the inner picture of health" was the basis of the author's certificate for a scientific work [13].

The procedure for participation of patients in the program was as follows. All patients in the rehabilitation department were encouraged to participate in the program of psychological rehabilitation. The program was not imposed, but only recommended, therefore the choice was based on the individual's awareness and the patient's needs. Lessons were performed by a cardiologist and a psychologist. Collaboration with the patient took place using the following steps: introductory conversation, clarification of the motivation for participation in the program; introduction of program of optimization of IPH: 5 interactive lessons using different training elements, with a duration of 60 minutes; individual psychological counseling (60 minutes) upon request of individual subjects. Post-diagnostic analysis of the results of program's impact occurred after 1 month, 6 months after the program has been finished.

Lessons take into account the different components of the internal picture of health (IPH) intervention, each component being considered in every lesson. As described earlier, classes were cyclic, groups were open, and each patient could join the group during the activity

without losing the training logic. During the individual lessons, significant components for each patient were determined and correction applied. If necessary, and on request, an individualized program was followed.

Conclusions

1. In order to improve the rehabilitation of patients after cardiac surgery, it is important to develop strategies to optimize the components of the IPH with the objective of defining individual rehabilitation paths.
2. The use of psychological and educational components of IPH, along with traditional treatment, reduces manifestations of anxiety and depression, improves quality of life, including alteration of the patient's perception towards both the disease and the necessity for active participation in rehabilitation activities.
3. Changes in disease perception lead to an improved outlook of the patient regarding health and motivation for treatment that in turn improves subjective and objective measures and promotes psychological well-being.

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DETERMINANTS OF DEVELOPING A PILOT OF COORDINATED CARE MODEL FOR PATIENTS WITH MULTIPLE SCLEROSIS IN POLAND

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A – study design, **B –** data collection, **C –** statistical analysis, **D –** interpretation of data, **E –** manuscript preparation, **F –** literature review, **G –** sourcing of funding

ABSTRACT

Background: Multiple sclerosis is a chronic and highly debilitating disease with very high economic and social consequences. Designing changes to improve the functioning of the healthcare model primarily requires learning about the needs of beneficiaries.

Aim of the study: The purpose of our study is the results' description and summary of conclusions of the research conducted in the past years. These results are currently being used for the construction of a coordinated care model for MS patients.

Material and methods: One questionnaire survey addressed to MS patients, carried out between 01.12.2013 and 01.02.2014 and the second one addressed to Polish and European medical professionals, carried out between 01.09.2016 and 04.10.2016 performed in 51 European centers and 2 branches of the Turkish Association of patients with MS.

Results: In the first survey 84.4% patients declared that during the illness they received mental support mostly from their family: 48.5% received it from physicians; 42.1% from a nurse. 64.8% of the respondents declared that they received no support from social organizations and 77.6% received no support from religious organizations. According to the results of the survey for healthcare professionals in Poland and Europe, in 54.9% of the European institutions and in 22.4% of the Polish institutions, dedicated IT systems are used for processing MS patients' data. Among institutions using IT, 52.9% of the European and 10.1% of the Polish ones keep the patient's entire documentation, as well as a patient satisfaction survey, in an IT system.

Conclusions: Based on our studies described above, the patients' needs, resources and capabilities seem to indicate that the scale of system inefficiencies is such that remodeling care for this well-defined group of patients is justified and feasible.

KEYWORDS: multiple sclerosis, coordination, patient satisfaction

Background

In December of 2017, the possibility to implement pilot programs was introduced to the legislation on healthcare services financed by public funds [1]. This change allowed the development of pilot programs directed at groups of patients whose disease requires the use of non-standard healthcare services.

A pilot test of an integrated care model for patients with multiple sclerosis (MS) is being prepared. MS is a chronic and highly debilitating disease with very high economic and social impact [2–6]. Some patients with the highest degree of impairment rate the state of their health as worse than death [7]. Kurztke scale - Expanded Disability Status Scale (EDSS) - is used to quantify the clinical state of patients with MS. The scale ranges from 0 to 10 in a half-integer spectrum, where 0 stands for the normal neurological state of a patient, 9.5 - a patient who is completely dependent, bedridden, incapable of successfully communicating or eating on their own, and 10 - death. Using this scale makes possible the standardization of the stratification of the MS patients' population.

Treatments decelerating the impairment may have also a positive influence on the patients' quality of life. Introduction of so called "drug programs" in the previous decade has given Polish MS patients the possibility of being treated with advanced medicinal products, significantly slowing down the progression of the disease. Unfortunately, the results of analyses of these programs' still do not allow for a unanimous judgment of their effectiveness and costs incurred for reaching specific goals or patients' wellbeing.

Aim of the study

The purpose of our study is the results' description and summary of conclusions of the research conducted in the past years. It is currently being used for the construction of a coordinated care model for MS patients in order to increase certainty that the programs being implemented adequately accommodate the needs of people suffering from this disease.

Material and Methods

Designing changes in the healthcare model to improve its functioning requires the learning of its beneficiaries' needs. In the past, this striving to learn the needs of, as well as opinions about the system of care for patients suffering from MS, became the foundation for conducting survey studies by the Urszula Jaworska Foundation (the representative of the patients) in tandem with the National Health Fund (the public payer). One was a patient satisfaction survey (the year 2013/2014, the respondents were patients suffering from MS) and the other was focused on a comparison of care standards in Polish and select European institutions treating patients with MS (2016, the respondents were the medical professionals working there) [8–10].

Both the above-mentioned survey studies, the first of which was directed at MS patients and the other at Polish and European medical professionals employed in institutions treating patients with MS, were conducted based on surveys designed by experts. The surveys were prepared according to the Delphi method, gathering and processing research questions formulated during expert group meetings, which then repeatedly underwent moderated discussion ending with the consensus of the gathered members. Most of the questions in the survey are of a closed-ended structure, which facilitates the comparability of the answers.

The survey for the first study (directed at patients) consisted of 45 questions which were divided into three topic blocks:

1. Metrics (the general section) - information characterizing the surveyed respondents (7 questions);
2. The disease - the treatment method and costs incurred by the patient (17 questions)
3. Quality of life - questions relating to changes in way of life before and after being diagnosed with multiple sclerosis, relating to private life and profession (21 questions).

This study was conducted in the period from 01.12.2013 to 01.02.2014 among 1000 patients suffering from MS. Two research methods were utilized [11].

1. Paper and Pen Personal Interview (PAPI) - conducting an interview using the paper version of the questionnaire; The survey was conducted in ten healthcare institutions in which those suffering from MS are treated, in: Gdansk, Grudziadz, Cracow, Lodz, Pila, Poznan, Rzeszow, Warsaw, Wroclaw and Zabrze (240 interviews).
2. Computer-Assisted Web Interview (CAWI) - online research using a website survey which was filled out by the respondents themselves on a computer (760 respondents). The people filling out the questionnaire in this way were verified (people who wanted to fill out the questionnaire had to send in an email, briefly introduce themselves and prove they have MS - only then did they receive a link to the online survey; the link to the survey was not directly shared on social media) to minimize the risk of the survey being filled out by people other than patients suffering from multiple sclerosis.

In the second study, the part directed at Polish medical professionals was done from 14.06.2016 to 04.08.2016 (52 days), whereas the portion directed at European medical professionals - in the period from 01.09.2016 to 01.10.2016 (34 days). 228 institutions participated in the Polish portion of the study and 51 in the European portion (49 clinical institutions treating MS and 2 departments of "The Multiple Sclerosis Society of Turkey"). These institutions were based in 19 countries: Belgium (15), Ireland (7), the Czech Republic (4), England (3), Norway 3), Germany (3), Turkey (2), Spain (2), Slovenia (2), Switzerland (1), Slovakia (1), Scotland (1), Portugal (1), The Netherlands (1), Lithuania (1), Iceland (1), Hungary (1), Finland (1), Bulgaria (1).

The survey for the second study consisted of 22 questions and spaces for additional remarks, where the first 5 questions identified the facility, and the following - the physician and the individual number of their contract with the public payer. The remaining questions

pertained to the organization of care and treatment for people with MS in the facility, access to specialists from different areas of medicine and to the IT tools used.

In the English language version sent out to the institutions in Europe, the beginning of the survey was modified by adding the name of the country and the facility's and physician's identifiers were left out.

Most of the questions contained in the survey had a closed-ended character, but for part of them, more than one answer could be given (especially those related to patient access to specialists and the tools assisting in treatment).

The method of gathering data relied on the active link to the online surveys (CAWI) that had been shared with respondents. In Poland, the studies were carried out in two ways:

1. The recruitment of medical personnel by the Urszula Jaworska Foundation was carried out by actively seeking out contacts to all neurological institutions in Poland, sending links and a request to fill out the survey by a medical representative in direct contact with patients with multiple sclerosis.
2. The recruitment of respondents from the administrative side was executed by the National Health Fund (NFZ) by sending out an active link to the survey study to the administrative personnel of the institutions tasked with treating neurological patients. Aside from hospitals, these were: neurological clinics, primary healthcare centers, and individual medical practices.

Furthermore, the model designed required epidemiological data pertaining to MS and the costs related to the treatment of this disease [12]. The lack of a Poland-wide register of those suffering from MS necessitates the use of reported data [13–15] by medical organizations realizing patient intervention for the public payer (the National Health Fund - the NFZ). Analyses of these data make it possible to connect the direct costs from the public payer's perspective with the therapy of specific patients, recognized in the payer's database according to the ICD-10 code G35, and the anonymization of their PESEL (a unique patient identification number in PL) numbers for analytical purposes [12]. The number of patients with MS in Poland (identified according to the ICD-10 code G35) shows large stability with low (+1.3%) growth dynamic yet with high (+14%) growth dynamic of direct costs [12].

Results

1000 patients with MS filled out questionnaires in research conducted in the years 2013/2014, of which 240 interviews were done (24%) according to the PAPI method and 760 interviews (76%) were done by the CAWI method.

In the questionnaire directed to the patients, 694 (69.4%) of respondents were women and 304 (30.4%) were men (0.2% declined to answer the question on gender). Respondents were in the age of 16-71 years. The largest group of patients was in the age range of 31-40 years (354 respondents, 35.4%). The highest percentile had received higher education (538, 53.8%). 310 (31%) of respondents' place of residence were cities with over 500,000 inhabitants. For over half (634 - 63.4%) the family's total household income was less than PLN 4,000, of which 121 (12.1%) households had an income lower than PLN 1,500. The monthly household income for 169 (16.9%) of those surveyed equaled from PLN 4,001 to PLN 6,000. Merely 89 (8.9%) of the respondents had a household income grossing PLN 6,000, and for 19 respondents (1.9%) - it equaled more than PLN 10,000. 95 (9.5%) respondents didn't disclose the amount of their monthly household income.

Most patients (700 - 70%) had been diagnosed with MS between the years 2005 and 2014. 588 (58.8%) of them didn't receive any social care benefits related to their disease, 294 (29.4%) received a pension, 195 (19.5%) an attendance allowance, and 16 (1.6%) a sickness allowance. Medical counsel was mostly given by neurologists (972 - 97.2% - usually a physician providing drug therapy) as well as physiotherapists – 282 - 28.2%; psychiatrists – 116 - 11.6%; psychotherapists – 73 - 7.3%; the remaining specialists accounted for 10.4%. On Fig. 1 the source of mental support for patients during their disease has been presented.

Most of the respondents (in total, 844 - 84.4% of the responses was "yes" or "predominantly yes") declared that they had received mental support from their family, 485 (48.5%) from physicians, and 421 (42.1%) from nurses. More than half (648 - 64.8% of the responses were "no" and "predominantly no") declared a lack of support received from social organisations or 776 (77.6%) from religious organisations. 12.3% of respondents (n=123) covered the costs of adapting their living space with personal funds, and most of the time the cost amounted from PLN 5,000 to 15,000 (31% of answers). The disease and the applied therapy had a significant influence on the personal lives of the respondents. One of the most impactful decisions was about having offspring (the medications used in treatment create limitations in this area). 283 (28.3%) patients resigned from having offspring, 405 (40.5%) didn't resign, and 300 (30%) hadn't thought about this. Women made the decision to resign from having offspring more frequently. When asked a question on the need to use the help of others in normal life situations, 63% of the surveyed answered that due to MS, they were dependent on others, in 86 (8.6%) they were constantly dependent, 164 (16.4%) - often, and 380 (38%) - sporadically or only in specific situations have to enlist the help of others. Depression accompanied 587 (58.7%) of the patients.

Despite the inconveniences related to the disease, 712 (71.2%) of patients continued their professional activities. (Fig. 2)

The second survey, conducted in 2016, was directed to medical professionals employed in institutions (228

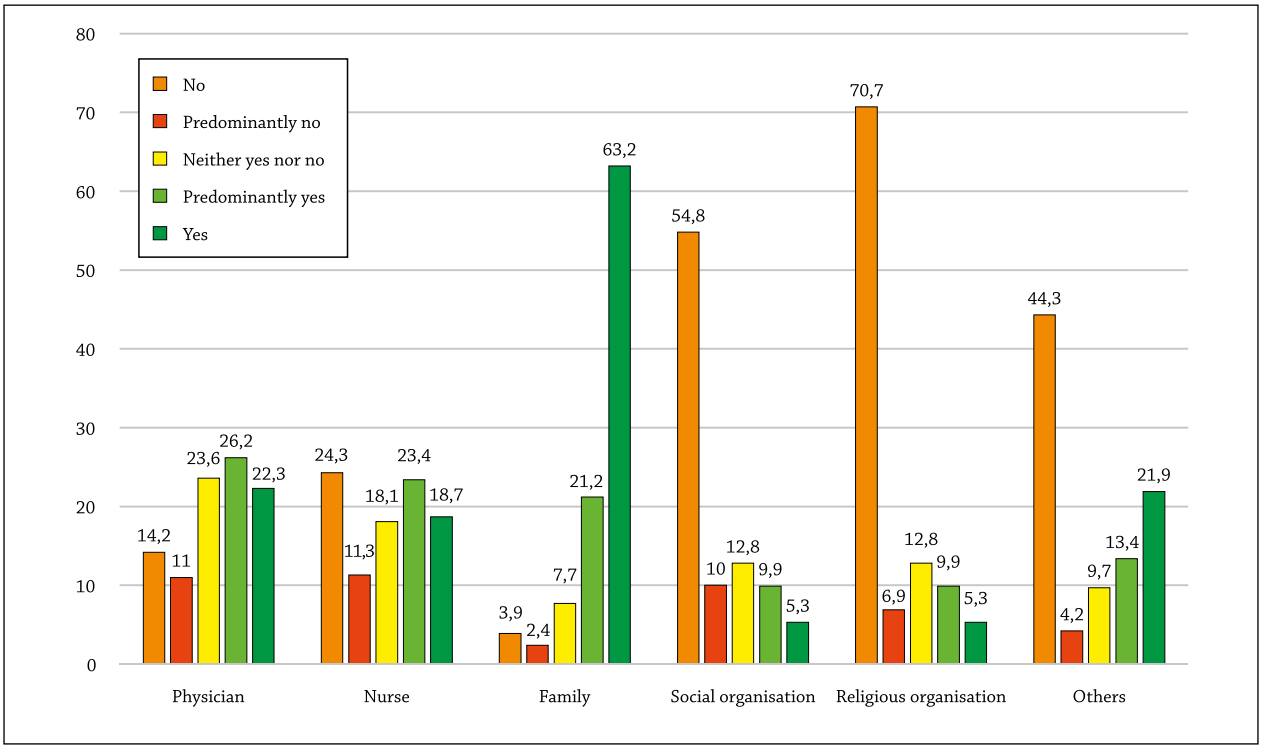

Figure 1. The assessment of mental support received based on the responses of the surveyed

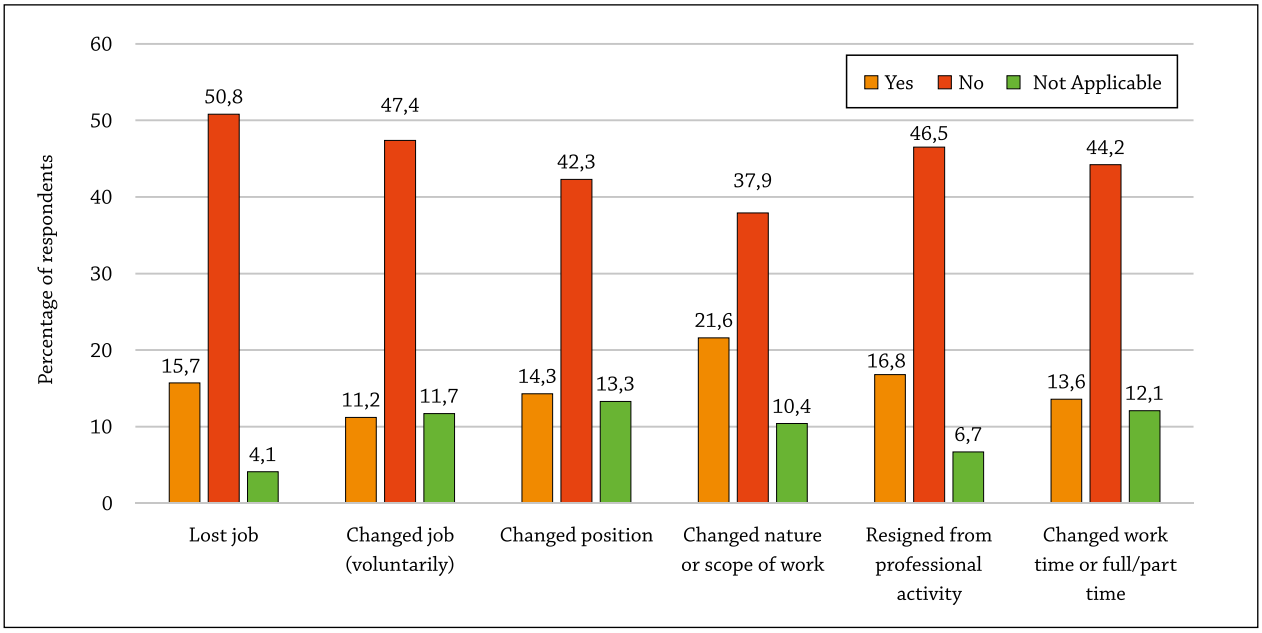

Figure 2. Professional activity status of the respondents

in Poland and 51 in the rest of Europe) treating patients with MS.

Answers from 51 European and 228 Polish institutions were received. In European institutions, the surveyed noted that patients have access to a care coordinator in their site (lack of such a function in the Polish healthcare system). In the case of disease flare-up most patients in Poland are referred to hospitals, whereas in European institutions, an ambulatory setting is preferred (Fig. 3).

In most (28- 54.9%) of the European institutions, dedicated IT systems are used for processing MS patients' data. In Poland 177 (77.6%) institutions do not employ IT systems to register patients with MS and process their data. Among institutions using IT, 27 (52.9%) European and 23 (10.1%) Polish ones keep the patient's entire documentation, as well as a patient satisfaction survey, in an IT system. The areas supported by systems have been described below (Fig. 4, Fig. 5).

Online registration is available more often in institutions in Poland (44 institutions – 19.3%) than it is in European ones (5 institutions – 9.8%); in contrast, online contact with medical professionals is much more available in European institutions (36 institutions – 70.6%) than in Polish ones (32 institutions – 14.0%).

The cooperation of social care and healthcare is poorly regulated in Poland compared to other European countries (Fig. 6).

Cooperation in the realm of patient care between the healthcare system and social care is meager and insufficient almost everywhere (Fig. 6). In the European systems, only 18 (35.3%) respondents indicated the existence of such a cooperation (in Poland 32 – 14.0%).

Discussion

Compiled results obtained with the use of PAPI and CAWI have revealed a high percentage of answers indicating an inadequate securing of MS patients' needs. It is not at all comforting that both patients and medical professionals in other countries also indicate similar areas in need of improvement. The natural course of the disease leads to gradual and (at present) inevi-

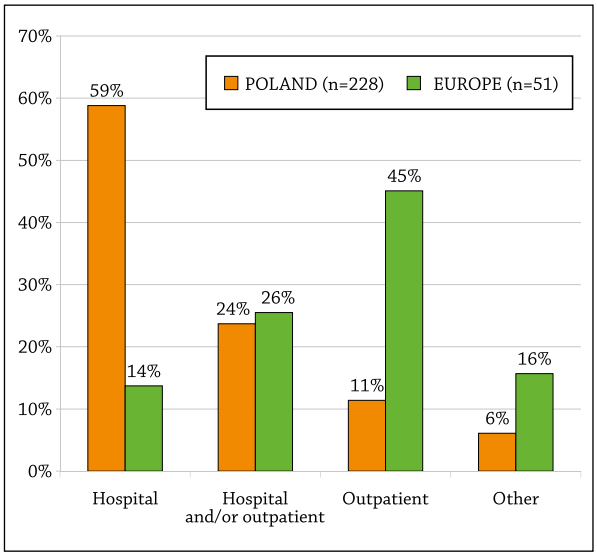

Figure 3. The area where an intervention is performed in case of disease flare-ups

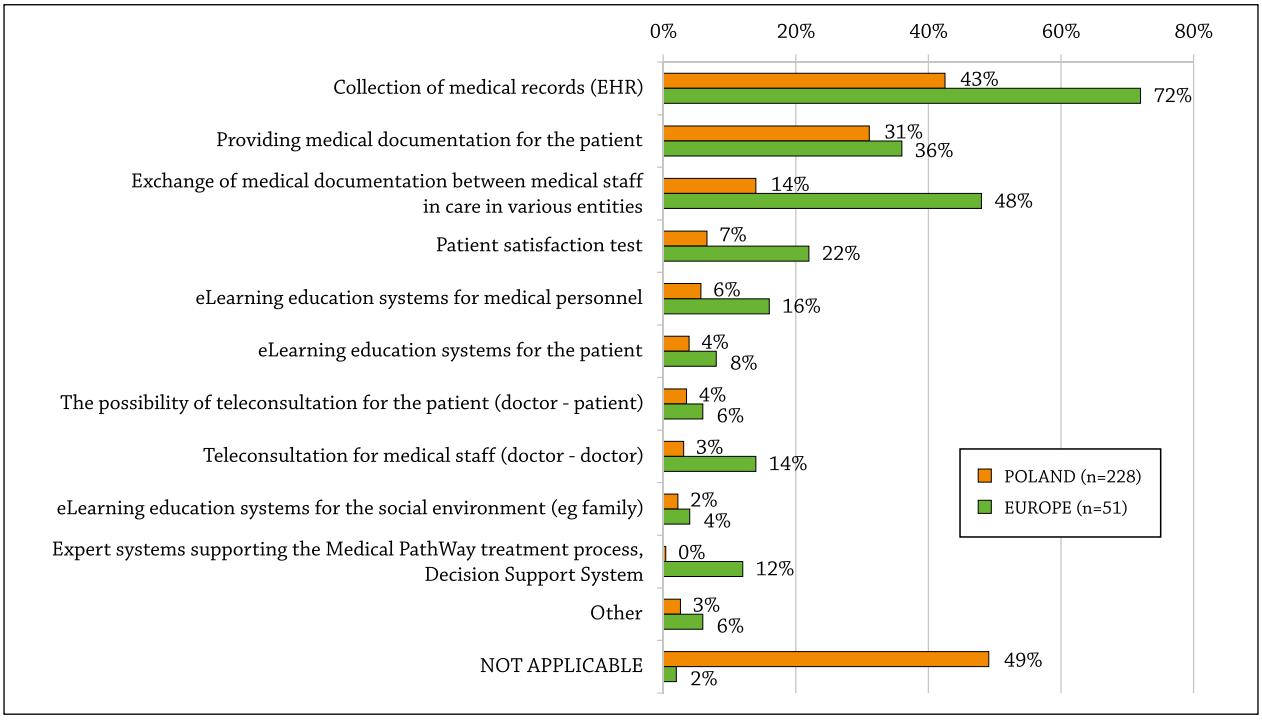

Figure 4. IT support for areas of care for a patient with SM in Poland and in Europe

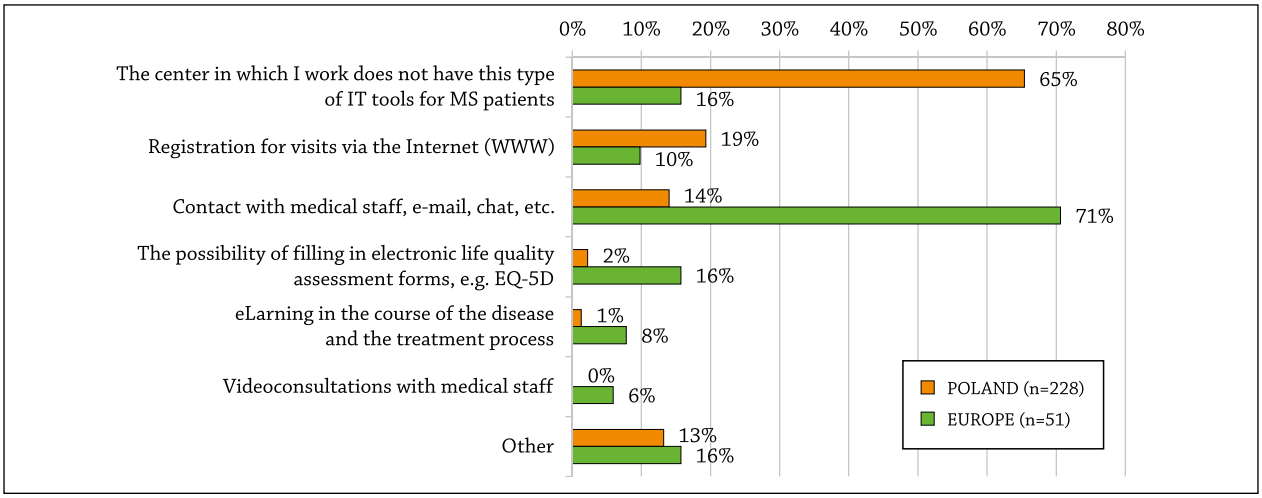

Figure 5. IT tools supporting patients in Polish and European institutions

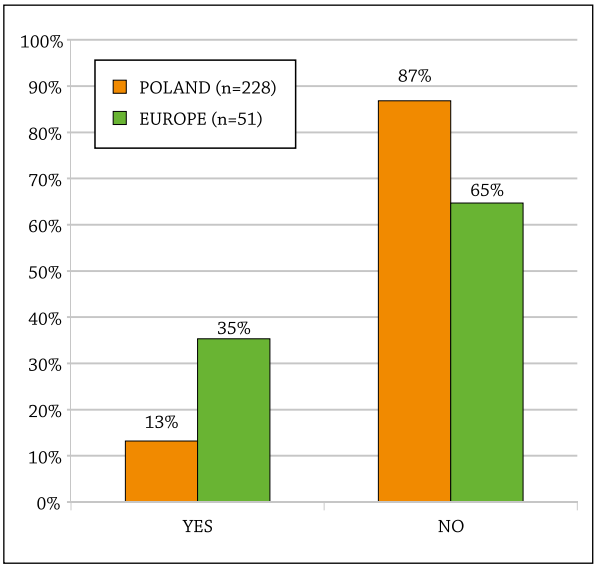

Figure 6. Exchanging information about a patient with SM between healthcare and social care

table impairment, especially in the physical sphere. It starts from mild prodromal symptoms and usually ends – regardless of the treatment used – with severe disability, when palliative care is the only therapeutic option.

The systems scaling and integrating the actions of various entities are gaining recognition to an ever-higher degree. Models of complex integrated care are meant to determine a rhythm of intervention of varying entities cooperating in the health domain toward the individual patient. The inadequacies and inconveniences, especially of communication and logistical nature, revealed in the survey, lead to the conclusion that it is necessary to remodel the organization of the healthcare and social services rendered in Poland to MS patients to gain greater effectiveness within the same catalog of interventions available. Considering a relative surplus of hospital services, yet concurrent deficits in other segments of this domain exist. The solution could be strengthening the link between health and social care, including increasing the number of "nursing" beds by replacing strictly "hospital" ones. This could significantly lower system costs, especially in departments treating elderly patients, whose hospital stay is a result of an inability to provide the minimum of care at home (single people, working families, etc.). On one hand, it is local infrastructure deficits that have an impact on the length of hospitalization, which is inadequate to state of health and severity of the disease or its stage. On the other hand, it's the systemic limitation in the ability to execute certain procedures in non-hospital institutions or in the patients' place of residence (e.g. dispensing medication by nurses , minor procedures etc.).

In 2014 the World Health Organization (WHO) issued a new definition of care focused on the patient, which has been recognized as the definition of integrated care: it is medical services administered and rendered to people in a manner ensuring the procurement of a health-promotion continuum, disease prevention, diagnosis, treatment, disease management, rehabilitation and palliative medical services, on varying levels and in different areas of the healthcare system, suitably to needs, throughout the entire lives of and in the form of constant dialogue with patients. The Triple Aim rule, a basic rule of integrated care and one described by Guus Schrijvers in his book "Integrated Care - Better and Cheaper" [16], pertains to all sides participating in healthcare. Improving the population's state of health, improving patient-care quality and reducing per capita healthcare costs, are three tasks that fall within the philosophy of the Triple Aim whose realization is advantageous for the patient. In integrated care, patients and healthcare employees become partners. The phrases: *according to need* and *in the form of continuous dialog with patients*, found in the WHO definition, define the change of patients into partners, consumers, active participants in the care process.

The starting point should be the analysis of the causes, not the consequences (i.e. observed ineffectiveness). A key element, crucial for effective conducting of the project, is the creation of an information system allowing the processing of the data necessary to analyze them, control the system and make decisions for all sides involved, including the National Health Fund and Ministry of Health. Such a system should integrate data from bases currently available for National Health Fund, medical and social care institutions on a central and local level. Simultaneously, performed also based on the data presented in this paper, analysis of patient needs in particular stages of the disease could make it possible to postulate rules of medical and socio-nursing services reference ability, then adequately adapt the rules of financing in terms of the mechanisms that reduce the overproduction of services and their improper reporting, but stimulate the maximization of pro-health- effects. Data analysis based on the postulated system should be automated and enable the identification of signals, i.e. specific deviations based on the analysis of large data sets (big data). The above-mentioned system could be the foundation for the electronic patient medical documentation (EDM) system. Obligatory registration of such data in the shared information system of the payer and service provider would enable easy generation of meeting the expected standards. This is essential, as currently the ability to conduct a quantitative (in a monetary dimension) analysis of system change impact is limited. we should also consider some limitation of actual systems, e.g. the denoting of flat-rate paid services as having no financial value. Hence, the possibility of combining seemingly excess data can be useful for the possibility of reaching the goal indicated above.

Conclusions

Based on the above-described patients' needs research, resources and abilities of the entities, it

appears that the scale of system ineffectiveness is large enough to justify implementation of the new model of care for this well-defined group of patients. Due to the possibly far-reaching consequences of a complete change, a pilot program would be required for no more than 5-10% of patients and related stakeholders.

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IS UPPER GASTROINTESTINAL BLEEDING STILL A LIFE-THREATENING CONDITION?

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A – study design, **B** – data collection, **C** – statistical analysis, **D** – interpretation of data, **E** – manuscript preparation, **F** – literature review, **G** – sourcing of funding

ABSTRACT

Background: Upper gastrointestinal bleeding is a common clinical problem and one of the main reasons for emergency hospitalization. It is associated with an overall mortality rate of 2% to 13%, despite advances in medical therapy. First-choice management is conservative treatment with endoscopic hemostasis.

Aim of the study: The aim of the study was to examine the epidemiological and clinical characteristics of patients with upper gastrointestinal bleeding with a focus on the course of hospitalization based on the etiology

Material and methods: A retrospective study was conducted in the Department of Surgery at the 4th Military Teaching Hospital in the years 2011–2016, comprising a total of 200 hospitalizations. 150 (75%) of the study group were men, and the mean age was 63.6±15.8 years.

Results: Patients most frequently presented with melena (n=105; 53.1%) and hematemesis (n=79; 40%) or coffee ground vomiting (n=57; 28.7%). . 138 (69%) of hemorrhages were managed with endoscopic hemostasis, and in 43 (21.5%) of cases conservative treatment was adequate. In 12 (6%) of cases, laparotomy was the first-choice therapy and in 7 (3.5%) cases, surgery was performed after an attempt at endoscopic treatment had failed. The sources of bleeding were: gastric ulcer – 58 (29%), duodenal ulcer – 48 (24%), esophageal varices – 31 (15.5%), gastric tumor – 15 (7.5%), Mallory-Weiss syndrome – 10 (5%), and Dieulafoy's lesion – 3 (1.5%). 16 (8%) of the hospitalizations were fatal.

Conclusions: Upper gastrointestinal bleeding still has a high mortality rate (8%). It more frequently affects men and the elderly. Gastric and duodenal ulcers are the most common etiologies of bleeding. Esophageal varices and neoplasms are also a significant source of bleeding. Despite the progress in the pharmacological treatment of peptic ulcers, the complications resulting from gastrointestinal bleeding continue to be a serious clinical problem.

KEYWORDS: gastrointestinal hemorrhage, endoscopy, peptic ulcer, esophageal and gastric varices

Background

Upper gastrointestinal bleeding (UGIB) is defined as a significant loss of blood the source of which is located proximally to the suspensory muscle of the duodenum, also known as the Treitz ligament. It is a common clinical problem and one of the main reasons for emergency admissions associated with abnormalities of the gastrointestinal tract. In the general population, its incidence is three times higher than that of lower gastrointestinal bleeding [1]. Despite the advent and development of endoscopic hemostasis techniques, the mortality rate remains high at an estimated at 2–13% [1–11]. The most frequently observed signs and symptoms of UGIB are hematemesis or coffee

ground vomiting (*melaenemesis*), and melaena, sometimes accompanied by local or generalized abdominal tenderness. If the hemorrhage is massive, hematochezia and signs of hypovolemic shock noticed an result. The most serious complications include incidents of re-bleeding and the exacerbation of comorbidities.. Peptic ulcers are the most common source of UGIB, accounting for 22% [3] up to 67% [11] of all recorded incidents, depending on the study. Varices of the esophagus and stomach are the cause of bleeding in approximately 5–30% of patients [3–6] and are also associated with a significantly higher mortality rate [9]. Many other conditions may lead to UGIB, including acute and erosive esophagitis, gastritis or duodenitis, portal hypertensive gastropathy, angiodysplasia, neoplasm, Mallory–Weiss syndrome and Dieulafoy's lesion [12,13]. In 15% of cases the etiology remains unknown. UGIB more often affects men and its incidence increases with age [14–16]. Widely known and confirmed risk factors for peptic ulcer bleeding are *Helicobacter pylori* infection, nicotine consumption (tobacco smoking), excessive production of gastric acid and chronic use of non-steroidal anti-inflammatory agents (NSAIDs) [17]. Varices of the esophagus or stomach are usually secondary to liver disease. UGIB in hemodynamically stable patients is typically diagnosed and treated with an esophagogastroduodenoscopy. Both guidelines published by the *European Society of Gastrointestinal Endoscopy* [18] and the *American College of Gastroenterology* [19] emphasize the role of early endoscopy (up to 24 hours after the onset of symptoms) in effective therapy. Early endoscopy minimizes the chance of complications, including reducing the risk of re-bleeding or death, and the necessity of surgical intervention. Conservative treatment is applied simultaneously with endoscopic hemostasis. First-choice intravenous drugs are proton-pump inhibitors (PPIs). H2 antagonist, somatostatin analogs and tranexamic acid are also used.

Aim of the study

The aim of the study was to examine the epidemiological and clinical characteristic of patients with upper gastrointestinal bleeding with a focus on the course of hospitalization based on the etiology.

Material and methods

A retrospective analysis was performed of the medical charts of patients treated in the Department of Surgery at the 4th Military Teaching Hospital between 2011 and 2016, compromising a total of 200 hospitalizations. The following data were collected: demographics, medical history (comorbidities, intake of medications, and presenting symptoms), physical examination and endoscopic findings, laboratory test results, history of blood transfusions, previously performed procedures and clinical outcomes. Patients included in the study were initially admitted to the emergency department and then transferred to the surgical ward with a diagnosis of upper GI bleeding. The intensity of ulcer hemorrhage was assessed endoscopically using the Forrest classification. Patients who were not admitted to the Department of Surgery were excluded from the analysis. Some patients were hospitalized more than once; 15 patients twice, 2 patients three times and one patient four times. The study reported on data from all hospitalizations (n=200). 150 (75%) of the patients were men. The mean age was 63.6 years (SD 15.8, range 21–98 years). The age distribution is presented in fig. 1.

The results were statistically evaluated, comparisons were carried out with the chi-squared test for contingency tables and the Kruskal-Wallis test. A significance level was established at α=5%. If a medical history was incomplete, those records were excluded from the analysis. Rates of nicotinism, may have been underestimated due to insufficient data concerning smoking. The study was approved by the local ethics committee of Wroclaw Medical University (No KB - 121/2011).

Results

In the course of bleeding, patients most frequently presented with melena - 105 (53.1%) and hematemesis - 79 (40%) or coffee ground vomiting – 57 (28.7%). Among comorbid illnesses hypertension - 74 (37.0%), alcohol abuse - 62 (30.8%) and nicotinism - 46 (22.8%) predominated. 35 (17.3%) patients had taken prophylactic aspirin before hospitalization, 21 (10.6%) and had regularly used NSAIDs. Patients' characteristics according to the etiology of bleeding are shown in tab. 1.

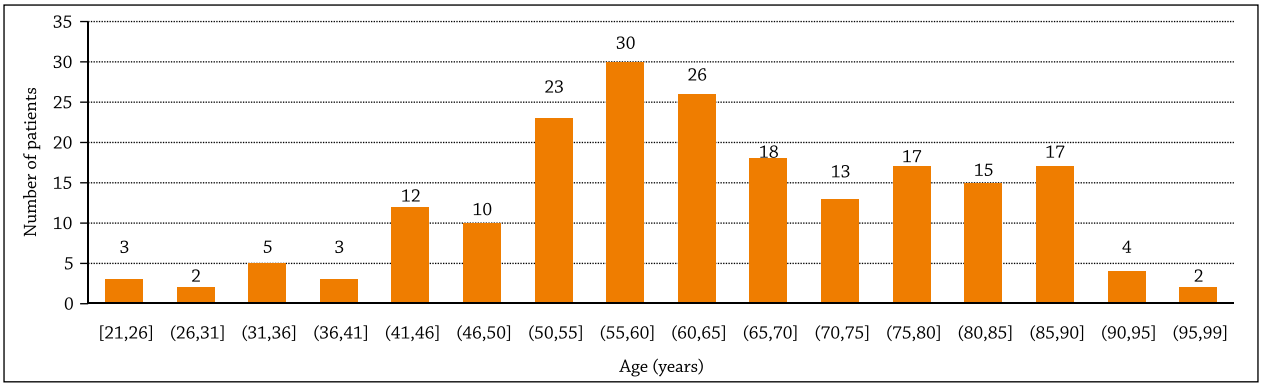

Figure 1. Patient' distribution by age

Table 1. Characteristics of patients

Variable	Etiology							p	total
	GU	DU	Ut**	EV	NPL	MWS	other		
Hospitalizations (n; %)	58 (29%)	48 (24%)	108 (54%)	31 (15.5%)	20 (10%)	10 (5%)	31 (15.5%)		200 (100%)
Mean age (years)	62.5	63.3	63	57.7	74.9	60.5		0.001	63.6
Males (n; %)	45 (77.6%)	36 (75%)	82 (75.9%)	22 (71%)	17 (85%)	7 (70%)		0.14	150 (75%)
Females (n; %)	13 (22.4%)	12 (25%)	26 (24.1%)	9 (29%)	3 (15%)	3 (30%)			50 (25%)
Symptoms present on the admission									
Hematemesis	47.6%	22.2%	35%	55.6%	36.8%	70%		0,02	40%
Coffee-ground vomiting	23.8%	22.2%	22.5%	33.3%	21.1%	50%		0.45	28.8%
Melena	54.8%	63.9%	58.8%	33.3%	47.4%	50%		0.19	53.1%
Hypovolemic shock	4.8%	16.7%	10%	14.8%	5.3%	0%		0.37	10%
Comorbid illnesses									
Alcohol use disorder	28.6%	10.8%	19.8%	70%	5.3%	40%		<0.001	30.9%
Smoking (ever)	31%	16.2%	24.7%	23.3%	21.1%	30%		0.75	22.8%
Cirrhosis	2.4%	5.4%	3.7%	100%	5.3%	20%		<0.001	22.9%
Hypertension	35.7%	27%	32.1%	30%	57.9%	50%		0.19	37%
Diabetes	19.%	8.1%	13.6%	30%	36.8%	10%		0.04	19.1%
Drug intake									
ASA	15%	18.8%	17.6%	11.5%	21.1%	10%		0.96	17.3%
NSAIDs	20%	25%	20.3%	0%	0%	10%		0.03	10.7%
β-blockers	17.5%	21.9%	20.3%	34.6%	57.9%	30%		0.01	28.7%
Anticoagulants	17.5%	18.8%	18.9%	11.5%	31.6%	10%		0.61	17.3%
IPP	15%	9.4%	12.2%	15.4%	52.6%	0%		<0.001	18%
Initial laboratory data									**mean**
Hb (g/dl)	9.83	8.26	9.13	8.36	7.44	11.77		<0.001	8.92
HCT (%)	29.4	25.55	27.71	25.28	22.88	34.74		<0.001	27.03
PLT (10^3/μl)	236	270	247	152	266	187		<0.001	227
RBC (10^6/μl)	3.29	2.75	3.05	2.78	2.62	3.83		0.0002	3
WBC (10^3/μl)	11.71	11.47	11.54	11.5	10.73	9.43		0.57	11.23
Creatinine (mg/dl)	1.17	1.21	1.18	1.09	1.27	1.12		0.89	1.25
INR	1.5	1.4	1.45	1.69	1.64	1.3		<0.001	1.54
APTT (s)	26.64	27.05	26.79	29.28	28.99	27.5		0.04	27.9
Average number of transfused units									
PRBCs	3.4	4.3	3.8	4.3	4.7	4		0.058	3.99
FFP	2.8	3.1	2.9	3	2.7	4		0.61	2.91
Mean hospitalization length (days)	4.4	4	4.2	4	5.6	3		0.28	4.15
Mortality	2 (3.5%)	6 (12.5%)	8 (7.4%)	5 (16.1%)	1 (5%)	0	2	0.23	8%

* The differences between the analyzed groups were considered significant with $p<0.05$

** The two patients in whom simultaneously hemorrhage from gastric and duodenal ulcers were observed, were included only in the Ut (Ulcers total) group, hence n=108.

(GU - gastric ulcer; DU - duodenal ulcer; Ut - ulcers (total); EV - esophageal varices; NPL - neoplasm; MWS - Mallory-Weiss syndrome).

138 (69%) hemorrhages were managed with endoscopic hemostasis, while in 43 (21.5%) - conservative treatment was adequate. In 12 (6%) hospitalizations, laparotomy was the first-choice therapy and in 7 (3.5%) - surgery was performed after an attempt at endoscopic treatment had failed. The most frequent sources of bleeding were gastric ulcer – 58 (29%), duodenal ulcer – 48 (24%), esophageal varices – 31 (15.5%), gastric tumor – 15 (7.5%), Mallory-Weiss syndrome – 10 (5%), and Dieulafoy's lesion – 3 (1.5%). Less prevalent (≤1%) were esophageal ulcer, gastric submucosal tumor (SMT), gastrointestinal stromal tumors , esophageal tumor, bleeding from an endoscopic retrograde cholangiopancreatography (ERCP) cicatrix, neoplastic infiltration of the duodenal bulb, erosive esophagitis, hemorrhagic gastropathy and polyps. In 9% of hospitalizations, the source of bleeding was not determined. In patients who suffered from alcohol use disorder, esophageal varices represented the largest percentage (37%) of findings.

The intensity of ulcer bleeding, assessed using the Forrest classification, is presented in tab. 2.

Table 2. Distribution of the bleeding intensity assessed with the Forrest classification

Forrest category	Gastric ulcers (n=60)	Duodenal ulcers (n=50)	Ulcers total (n=110)
Ia (spurting hemorrhage)	6 (10%)	6 (12%)	12 (10.9%)
Ib (oozing hemorrhage)	34 (56.7%)	26 (52%)	60 (54.5%)
IIa (non-bleeding visible vessel)	6 (10%)	4 (8%)	10 (9.2%)
IIb (adherent clot)	7 (11.7%)	5 (10%)	12 (10.9%)
IIc (hematin on ulcer base)	5 (8.3%)	7 (14%)	12 (10.9%)
III (clean ulcer base)	2 (3.3%)	2 (4%)	4 (3.6%)

A total of 19 laparotomies were performed, for the following reasons: unsuccessful endoscopic management (7), gastric ulcer perforation (6), gastric tumor without perforation (2),gastric tumor with perforation (1), gastric SMT (1), duodenal perforation (1), acute abdomen (diagnostic laparoscopy, with source of bleeding defined) (1).

16 (8%) hospitalizations were fatal. The mean length of hospitalization was 4.1 days (SD 3.6). During one stay, on average 4 units of PRBCs and 3 units of FFP were transfused.

Discussion

Recently conducted epidemiologic studies reported a decrease in the incidence of UGIB, which, depending on the center, ranges from 36 to 134 cases per 100,000 inhabitants [3,4,7,8,10,11]. This decrease may be associated with the popularization of *Helicobacter pylori* eradication protocols, the preventive intake of gastric acid secretion inhibitors in patients undergoing chronic NSAID therapy and the lower percentage of smokers in the population. The pattern of etiologies is also changing. A significant decline in the frequency of peptic ulcers as a source of bleeding has been observed, although peptic ulcers remain one of the main reasons for hospitalization due to UGIB. This trend applies particularly to duodenal ulcers, while the proportion of gastric ulcers has been reported to be slightly less [7–10] by some authors or, according to other authors, even increasing [5,11]. Several recent studies have reported that esophagitis [5,9] and neoplastic lesions [5,9,11] have also become a major cause of UGIB. As a consequence, the profile of a patient who presents to a hospital emergency department with signs of bleeding is also changing. Unfortunately, the literature lacks data specific to the Polish population. The aim of the study was to determine the epidemiological profile of patients admitted to the surgical ward with a suspicion of UGIB, with a focus on the etiology. The demographic profile of the group in this study is consistent with that of other centers in terms of both mean age and sex distribution [3,6,15,20]. The incidence of gastric and duodenal ulcers as a bleeding etiology (54.5%) is higher than reported by other authors [1,3,5,7,10,14,15,20], although not in all studies [4,6,9,11]. The reason for this disproportion may be the excessive use of nonsteroidal anti-inflammatory drugs and the high percentage of cigarette smokers in Poland, comparing to the Western Europe and North America [21–23]. Bleeding from esophageal varices accounted for 15.5% of all hospitalizations. The literature reveals a large discrepancy in the incidence of varices, with proportions ranging from 3% in a study conducted in the United Kingdom [3] to 33% in the United States [5]. These differences are primarily due to the socioeconomic status of the different populations, affecting the risk factors for liver disease leading to cirrhosis and the development of esophageal varices. In 10% of cases in our study, bleeding was caused by neoplastic lesions, which is a higher than that observed in other studies.

Our analysis also includes a comparison of the patient profile, the symptoms present on admission and the course of hospitalization based on the etiology. The greatest mean age was observed in the neoplasm group, and the youngest patients were those with bleeding esophageal varices. Variceal bleeding and Mallory-Weiss syndrome were associated with a higher likelihood of hematemesis as a manifestation of UGIB. Among the comorbidities, the incidence of variceal bleeding was significantly higher in patients with alcohol use disorder, cirrhosis and diabetes. The incidence of variceal bleeding was also higher in cancer patients. More than 20% of the patients with peptic ulcers as the cause of bleeding had a history of NSAID intake. Significant differences were also found in laboratory parameters at admission, primarily hemoglobin, hematocrit and platelet count, which were lowest in patients with variceal bleeding. These data are consist-

ent with other studies. A history of liver disease and alcoholism, being younger, having hematemesis and a low hemoglobin and platelet count have been reported as predictors of esophageal varices as a cause of UGIB in other studies [24,25]. An early assessment of the potential source of bleeding from the upper gastrointestinal tract allows appropriate therapeutic procedures to be implemented even before an endoscopic examination, the timing of which is also relevant.

The mortality rate of 8% which was observed is high compared to similar studies [1,4,5,7]. The reason for this difference may be the fact that the group of patients in this study were admitted to the surgical ward because they presented more severe symptoms. Less serious cases such as those with esophageal, gastric and duodenal erosions, which were primarily transferred to the gastroenterology unit at the department of internal medicine, were excluded from our study. In more than half of the patients with gastric or duodenal ulcers, the endoscopic examination showed active bleeding (Forrest IA and IB), while categories II and III predominated in other centers, and these were associated with a better prognosis. In our study, only in-hospital deaths were taken into account. There were no data on the 30-day survival rate.

Conclusions

1. Upper gastrointestinal bleeding is a serious condition and still has a high mortality rate (8%). It affects men and the elderly more often.
2. Gastric and duodenal ulcers are the most common causes of bleeding. Esophageal varices and neoplasms are also a significant source of UGIB.
3. Despite the progress in the pharmacological treatment of peptic ulcers, the complications resulting from the bleeding continue to be a serious clinical problem.

List of abbreviations

- UGIB - upper gastrointestinal bleeding
- NSAIDs - nonsteroidal anti-inflammatory drugs
- PPIs - proton-pump inhibitors
- GI - gastrointestinal
- ERCP - endoscopic retrograde cholangiopancreatography
- ASA - acetylsalicylic acid
- PRBCs - packed red blood cells
- FFP – fresh frozen plasma
- SMT - submucosal tumor
- GIST – gastrointestinal stromal tumor

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THE ROLE OF PRIMARY CARE PHYSICIANS AND NURSES IN CONVINCING PATIENTS TO PARTICIPATE IN A COLORECTAL CANCER SCREENING PROGRAM IN A POLISH COORDINATED CARE ORGANIZATION: A QUESTIONNAIRE-BASED STUDY

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ABSTRACT

Background: Medical assistants/care coordinators play a crucial role in the coordinated care system. The tasks of nurses and some qualified supporting staff have been extended to include this role along with the implementation of the pilot program *POZ Plus* in Polish primary healthcare. A personalized approach to the patient is especially important during the implementation of large-scale prevention programs.

Aim of the study: To assess who has the greatest influence on the patient's decision to undergo screening colonoscopy and outline the current and potential roles of nurses in this process.

Material and methods: This questionnaire-based study was conducted at the coordinated care facility Medical and Diagnostic Center (CMD) in Siedlce, Poland between March 1st and June 15th, 2017.

Results: 138 patients participated in the study. The majority (75; 54.4%) reported they were directly convinced to undergo colonoscopy by a primary care physician. 18 (13.0%) were convinced by a nurse, and 22 (15.9%) by another specialist. The remaining (23; 16.7%) patients indicated other factors. The majority of patients (74; 53.6%) responded saying that all necessary information about the entire test course was provided by the nurse, while 35 (25.4%) shared that this information had come from the primary care physician, 8 (5.80%) from the specialist doctor, 3 (2.17%) from the receptionist and 18 (13.0%) from other sources of information, such as the Internet, leaflets and notice boards.

Conclusions: We found that primary care physicians at this institution have an important role in convincing patients to undergo preventive colonoscopy, while nurses provide key information to patients on the preparation and the course of this procedure. Although the current model seems to be effective in a coordinated care setting, there may be still a place for nurse care coordinators to take on some tasks previously performed by doctors.

KEYWORDS: patient-centered care, medical staff, colorectal neoplasms, tasks

Background

Integrated care is a concept combining input resources, service delivery processes, management and organization health services for the purpose of health promotion, disease prevention, diagnostics, therapy and rehabilitation. Primary healthcare has a fundamental role in society, according to the prevailing opinions of experts and scientists. It is essential for the integration of care due to its "gate-keeper" function and involves the coordination of primary care physicians and their healthcare teams in local communities. Nurses as care coordinators play a crucial role in the integrated care system. Over the past few years, nurses' responsibilities have increased significantly. Nurses are authorized to perform a wide range of activities in Poland, including tasks previously performed by doctors. This is especially important for the patient-centered approach during the implementation of large prevention programs [1–3].

Colorectal cancer (CRC) is the second leading cause of cancer death in Poland and Europe [4,5]. According to Poland's National Cancer Registry, in 2010 there were 15,800 cases and almost 11,000 deaths due to CRC. CRC is therefore an important health problem across Europe [5].

Most CRCs develop from nonmalignant precursor lesions called adenomas over a long period of time. This slow development provides an opportunity for screening tests, which may result in detection of CRC at an early stage and the initiation of treatment even before symptoms occur. Early treatment of invasive lesions is both more effective than in more advanced stages and most likely less detrimental for the patient's quality of life [4,6].

Implementation of CRC screening programmes is recommended in both EU Member States and the US to lower the population's cancer burden [6,7]. In Poland as part of the Colon Cancer Screening Program implemented by the Ministry of Health, free preventive colonoscopies are performed [8].

Patients take part in the programme in one of two ways, either they directly contact the doctor, or they are invited by the doctor to participate. 1) In the non-invitation method, also known as "opportunistic", the patient applies directly to any doctor or applies by filling out the questionnaire himself. These patients fall into three categories: 50–65 years of age, with or without family history, and have not had a colonoscopy in the prior ten years; 40–49 years, who have had a first degree relative diagnosed with colon cancer; 25–49 years, from families with hereditary colorectal cancer but not HNPCC (Hereditary Non-Polyposis Colorectal Cancer). In cases of suspected HNPCC, it is necessary to refer the patient to the genetics clinic and if confirmed, have colonoscopies performed every 2–3 years. Exceptions are patients in which genetic mutations are not found. A person may be dismissed from performing control colonoscopy. 2) The invitation method involves personal invitations to people aged 55–64 to participate in the study. Invitation to a preventive colonoscopy is active until the age of 64 by the invitee [9].

Aim of the study

The main purpose of the study was to assess the influence of healthcare professionals on patients' decisions to perform screening colonoscopy. Additionally, we wanted to outline the current and potential roles of nurses in this process.

Material and methods

Study design and setting

The study was carried out in two endoscopy laboratories at the Medical and Diagnostic Centre, Siedlce, Poland between March 1st and June 15th, 2017 on patients undergoing a colonoscopy screening.

Participants and study size

Patients received a questionnaire after the examination and were instructed on how to fill it out. For the research purposes, 150 questionnaires were prepared, 145 were returned, of which 138 were filled out correctly and were statistically analyzed.

Variables

The following questions were asked: 1) Who directly convinced the patient to undergo colonoscopy? 2) How many attempts were needed to persuade the patient to undergo a colonoscopy? 3) What were the sources of information about colonoscopy and its benefits? 4) What were the patients' concerns before undergoing colonoscopy? 5) What were the main factors for making the final decision to do colonoscopy? 6) What was the main source of information about the preparation and the course of colonoscopy?

Statistical methods

Chi-squared test for given probabilities was used. The hypothesis tested was whether the population probabilities are all equal. R v3.5.3 (for Mac OS X 10.13.6)

statistical software was used for all analyses. The significance level was set at 0.05.

Ethical issues

Participation in the research was voluntary and anonymous. Patients received Patient Information and Informed Consent Forms. The study did not need Ethics Committee approval. However the procedures were in accordance with the Declaration of Helsinki.

Results

Participants

138 patients responded to the questionnaire's queries after the colonoscopy procedure, of whom 80 (58.0%) were women and 58 (42.0%) men. The patients' age ranges were as follows: 29 (21.0%) aged 40–50; 77 (55.8%) aged 51–60 years; 32 (23.2%) aged 61–65. Most patients lived in the cities (83; 60.1%) and had at least a secondary education (62; 44.9%) (tab. 1).

Main results

The largest group of patients reported they were directly convinced to undergo colonoscopy by a primary care physician—75 (54.4%). 18 (13.0%) patients were persuaded by a nurse, 22 (15.9%) by a specialist such as a gastroenterologist, gynecologist, or cardiologist and 10 (7.25%) by a family member. 10 (7.25%) patients volunteered for colonoscopy, and 3 (2.17%) indicated other reasons for participating in the screening program (tab. 2).

Most patients (114; 82.6%) needed only one encouragement/invitation for the colonoscopy and only 4 patients (2.89%) needed three or more invitations (tab. 3).

Additional comparison of data concerning patients who were convinced to undergo colonoscopy by primary care staff and patients persuaded/invited for the colonoscopy only once was performed. 74 of 93 patients directly convinced to undergo colonoscopy by the primary care staff needed only one persuasion/invitation for the colonoscopy. In this group, 61 patients were persuaded/invited by a primary care physician and 13 by a nurse.

Patients shared that the primary source of knowledge about the benefits of a colonoscopy were their primary care physician—72 (52.2%), nurse—26 (18.8%), informative materials (leaflets) in outpatient clinics—22 (15.9%), the media—15 (10.9%), midwife—1 (0.72%) and other sources—2 (1.45%) (tab. 4).

The biggest colonoscopy test-associated fear was the possibility of pain, as indicated by 71 (51.5%) patients. 36 (26.1%) and 11 (7.97%) responders were most afraid of the results and of the intimacy of the procedure, respectively. 3 (2.17%) patients had other fears including insufficient knowledge and fear of the unknown. Only 17 (12.3%) patients did not have any concerns (Table 5).

The most important impact factor in making the final decision to undergo the colonoscopy was: health concern, CRC in immediate family members, pressure

Table 1. Characteristics of responders

General characteristics of responders		
No. of responders	No./% of women	No./% of men
138	80 / 58.0%	58 / 42.0%
Age of responders (No. / %)		
40–50 years	51–60 years	61–65 years
29 / 21.0%	77 / 55.8%	32 / 23.2%
Location of home (No. / %)		
City	Rural area	
83 / 60.1%	55 / 39.9%	
Education (No. / %)		
Higher education	Secondary education	Primary/vocational education
40 / 29.0%	62 / 44.9%	36 / 26.1%

Table 2. Persons who directly convinced the patient to undergo colonoscopy

Who directly convinced the patient to undergo colonoscopy?	No. of participants	% of participants
Primary care physician doctor	75	54.40%
Specialist doctor	22	15.90%
Nurse	18	13.00%
Family member	10	7.25%
Volunteered herself/himself	10	7.25%
Other	3	2.17%

Chi-squared test for given probabilities: Chi-squared = 150.78, df = 5, p<0.001

Table 3. Number of invitations to persuade the patient to undergo a colonoscopy

No. of invitations	No. of responders	% of responders
Only one	114	82.60%
Two	20	14.50%
Three or more	4	2.89%

Chi-squared test for given probabilities: Chi-squared = 153.57, df = 2, p < 0.001

Table 4. Sources of information about colonoscopy and its benefits

Source of information about benefits of colonoscopy	No. of responders	% of responders
Primary care physician	72	52.20%
Nurse	26	18.80%
Informative leaflets	22	15.90%
Media	15	10.90%
Midwife	1	0.72%
Other sources	2	1.45%

Chi-squared test for given probabilities: Chi-squared = 147.83, df = 5, p<0.001

from a close relative, and were seen in 106 (76.8%), 18 (13.0%), 11 (7.97%) and 3 (2.17%) patients, respectively (tab. 6).

The majority of patients—74 (53.6%) shared that the nurse provided all necessary information about the preparation and test course. 35 (25.4%) shared that it had been the primary care physician, 9 (6.52%) obtained information from the Internet, 8 (5.80%) from a specialist doctor, 3 (2.17%) from the receptionist and 9 (6.52%) from another source, including leaflets and notice boards. 137 patients (99.3%) answered that they received comprehensive information (tab. 7).

Table 5. Patients' concerns before undergoing colonoscopy

Patients' concerns before undergoing colonoscopy	No of responders	% of responders
Possibility of pain	71	51.50%
Positive test results/ bad diagnosis	36	26.10%
Lack of intimacy during procedure	11	7.97%
Insufficient knowledge/ fear of unknown	3	2.17%
No concerns at all	17	12.3%

Chi-squared test for given probabilities: Chi-squared = 106.78, df = 4, p<0.001

Table 6. Main factors for making the final decision to do colonoscopy

Main factors for making final decision to do colonoscopy	No. of responders	% of responders
Concern for health	106	76.80%
CRC in close family	18	13.00%
Pressure of close relative	11	7.97%
Other	3	2.17%

Chi-squared test for given probabilities: Chi-squared = 200.84, df = 3, p<0.001

Table 7. Source of information about the preparation and the course of colonoscopy

Source of information about the preparation and the course of the test	No of responders	% of responders
Nurse	74	53.60%
Primary care physician	35	25.40%
Internet	9	6.52%
A specialist doctor	8	5.80%
Medical receptionist	3	2.17%
Other (leaflets, notice boards)	9	6.52%

Chi-squared test for given probabilities: Chi-squared = 163.57, df = 5, p<0.001

Discussion

Key results

Social competence of healthcare professionals is very important and affects quality of care and satisfaction of patients being provided with health services. Physicians' social competencies especially impact adherence to recommendations [10–13]. Although the tremendous role of primary care physicians in convincing patients to undergo colonoscopy screening was evident, nurses had a remarkable impact on successful persuasion of the necessity of screening colonoscopy. 13.0% of patients were convinced to undergo colonoscopy by a nurse and 18.8% patients received colonoscopy information from one. Nurses were also the main source of knowledge about the preparation and the course of the colonoscopy for 53.6% of patients (tab. 2, 4, 7).

In this survey, fear of pain was the biggest concern of patients (51.5%). Patients were also afraid of receiving worrisome results and the intimacy of the procedure, 36 (26.1%) and 11 (7.97%) respectively. It is worth emphasizing that 137 patients (99.3%) felt that they had received comprehensive information preparing them for the study and its course and only one patient was unsatisfied (tab. 4).

Interpretation

The main triple assumptions (Triple Aim) of coordinated care are to help healthcare systems deliver population health improvements, improve the quality of individual care and reduce patient costs. Crucial to the effective implementation of the integrated care model is the appropriate assignment of tasks to the staff. Medical assistants/care coordinators play a crucial role in the coordinated care system [1–3]. The roles of nurses and some qualified supporting staff have been extended to include the implementation of the pilot program *POZ Plus* in Polish primary healthcare [14]. Nurses are authorized to perform a wide range of new activities. This role is especially important in personalized medicine, so necessary for the implementation of large-scale prevention programs in the coordinated care setting [15].

Generalisability

The authors suggest that teamwork between primary care physicians and nurses is highly effective for preventive programs. Although the current model seems to be effective in a coordinated care setting, there may also be additional areas and roles that nurse care coordinators can participate to improve healthcare. Organizational changes implementing new task division structures assigning new roles, work time and tools to nurses could lead to a significantly increased number of patients participating in prophylactic programs. It may also improve patients' perceptions of the role of nurses from that of a passive (slightly dominant at pre-

sent in Poland) to an active one in delivering healthcare. Lastly, it will permit doctors spending more time with patients with more severe or chronic illnesses.

Conclusions

Currently primary care physicians have the primary role of convincing patients to undergo preventive colonoscopy whereas nurses play an important role in providing patients with information about the preparation and course of their colonoscopies. These two medical professionals, working together, have the greatest impact on patients' decisions to undergo CRC screening, the doctor by emphasizing the need and the nurse by addressing the patients' concerns.

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INFLUENCE OF THE FEAR OF DEATH ON BODY IMAGE EVALUATION

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ABSTRACT

Background: Research on the consequences of fear of death often consists of classical investigations within the sphere of social psychology. However, the aspect of body image regarding this issue remains largely unexplored.

Aim of the study: The goal of the conducted experiment was to examine the mechanisms reducing the fear of death. The respondents had two options to choose from: (1) increasing self-esteem in terms of physical attractiveness, or (2) lowering the rating of the body image presented in the photographs.

Material and methods: The study was conducted using the following tests: (1) the Memory Test, developed by Łukaszewski and Buczny; (2) the Body-Esteem Scale (BES), developed by Franzoi and Shields; (3) the UMACL Mood Adjective Checklist, developed by Mathews, Chamberlain, and Jones; and (4) the Body Shape Attractiveness Questionnaire. In this report, we present results of an analysis of 221 respondents (108 women and 113 men).

Results: Death-related thoughts influence the perception of female body attractiveness. Respondents with awareness of mortality salience rated the attractiveness of body shape as lower than respondents from the control group.

Conclusions: The present experiment confirmed the influence of fear of death on the evaluation of cultural and biological standards of female physical attractiveness, as well as, the hesitation of participants' self-esteem and mood related to sex. The lack of critical evaluation of others and a positive self-evaluation effectively protects an individual against mood deterioration, and these effects were observed among men. However, these mechanisms do not apply to women, since women reacted critically to both body shapes in the photographs and their own bodies.

KEYWORDS: fear of death, body image, ideal standard of attractiveness, self-esteem, mood

Background

Terror management theory, created by Tom Pyszczynski, Jeff Greenberg and Sheldon Solomon [1], defines the mechanisms and consequences of experiencing mortality salience. According to the theory's assumptions, the attempt to accept mortality is the main driver of human behavior, whereas culture and self-esteem constitute effective mechanisms created by humans to face death. Both mechanisms aim to provide humans with tools to "fight" the fear of death and, as a result, provide them with the sense of a meaningful life and security [2,3]. There are two types of adaptation processes. The first type, proximal defenses, are conscious, rational attempts to remove death-related thoughts from the focal attention [4]. Distal defenses, in contrast, activate anxiety buffers by sustaining beliefs that an individual's worldview is the right one, as well as, maintaining and increasing self-esteem [5,6]. The worldview protects the individual, provided that certain conditions are met. In particular, an individual shall believe that his/her worldview as well as the standards and values that are related to it are significant and identify with a given part of culture [7]. The individual must also have high self-esteem regarding the fulfillment of cultural standards [8]. Coping with death-related anxiety involves mainly intergroup bias, which involves a defense of one's own views and attachment to those who share similar believes, as well as, rejection and disapproval of opposing worldviews and the people who share them [1,8–10]. Defining a worldview,

in relation to terror management theory, may concern significantly narrower issues than origin, religion, or political beliefs. It may relate to, for instance, physical attractiveness, which is a prized value in western culture [11,12].

The second buffer that defends against the fear of death is high self-esteem, defined as an evaluation of an individual's own worth. Worth determines whether an individual perceives himself as good, competent, and decent, as well as, his/her affective reaction to him/herself, which regulates mood [13]. According to Łukaszewski [14], the new category that allows for an explanation of human behavior resulting from the fear of death is mood regulation mechanisms, since it is obvious that experiencing mortality salience causes unpleasant emotions and thus, humans are naturally motivated to change them into more positive ones.

Satisfaction with appearance, self-evaluation of shape and body parameters, and finally size perception – which are all parts of body image – are absolutely subject to change in the event of experiencing mortality salience. Jamie Goldenberg and colleagues [15] showed that people who feel satisfaction with their own appearance when experiencing the arousing fear of death find their body image, which is a component of self-structure, to be more significant. Research conducted by Łukaszewski [14] showed that manipulation of mortality salience increases clear anxiety among individuals who are unsatisfied with their appearance, and are also more sensitive to death-related signals.

Baldwin and Wesley [16] and others conducted research on the meaning of interpersonal relations and perceiving as well as judging others as a buffer that defends against existential anxiety. They showed that experiencing mortality salience does not influence the evaluation of others, but that the level of the evaluator's self-esteem clearly influences the polarization. People with a high self-esteem formulate extreme opinions, which, according to Łukaszewski [14], means striving towards equivalence (i.e., a reduction of uncertainty).

One of the most effective ways to reduce the fear of death is affiliation, especially when joining a group that fosters the maintenance of self-esteem. If, however, the group influences the self-esteem of an individual negatively, then the individual will distance him/herself from the group [17].

It is not surprising that the self-objectification theory by Barbara Fredrickson and Ann Roberts [18] became an inspiration to widespread research. This concept assumes that people have a tendency to perceive the female body as an object that is under constant observation and evaluation, mainly in terms of sexual attractiveness. This objectification of the body is internalized by women, which results in constant monitoring and evaluation of appearance and comparing the shape of one's own body to the existing cannons of beauty [19]. In the event of mortality salience, the tendency to objectify the body increases, and this increase is particularly clear among women. Objectification of women is stronger among men from the control group, and women who experience the arousing fear of death [20]. Research on the evaluation of physical attractiveness conducted by Mark Landau and associates [21] showed that men from the control group liked pretty and sexily dressed women more in comparison to women from the control group; however, in the event of mortality salience, the rating made by men was lower and did not differ from those made by women. Further research showed differences in the evaluation of female attractiveness that depended on whether or not their sexuality was exposed. When the female image was sexual and/or provocative, female attractiveness was assessed to be significantly lower in the event of mortality salience. Landau emphasizes that, in contrast to women, men who experience the fear of death evaluate women who expose their sexuality more rigorously. Goldenberg and associates [15] claim that a negative evaluation of the female sexual image is made when the respondents recognize the animal nature of humans in women.

Extensive research shows that the most attractive female body shape is similar to the shape of the letter 'A', corresponding to the body proportions 90-69-99. However, the body proportions of models and beauty competition finalists amount to 90-60-90, and their shape is more similar to the shape of the letter 'H'. According to Andrzej Szmajke [22], the preference for the female body shape with wide hips is evolutionarily determined; however, the body shape with an equal size of breast and hips constitutes a new pattern of female attractiveness that is determined culturally.

Aim of the study

The goal of the conducted experiment was to examine the mechanisms that reduce the fear of death.

Material and methods

Respondents

A total of 221 students (108 female and 113 male) from Opole University, Opole University of Technology, and the Medical University of Opole took part in the research. All respondents were randomly assigned to the groups. Participation in the study was completely voluntary and anonymous. The average age of respondents was 20.15 years (SD = 1.37). The study protocol was approved by the Research Project Committee of the Faculty of Psychology and Humanities, and the Andrzej Frycz Modrzewski University in Cracow, Poland.

Study design and setting

The respondents had two options to choose from: 1) increasing self-esteem in terms of physical attractiveness, or 2) lowering the rating of the body image presented in the photographs. The assessment was applied to three dimensions: 1) sexual attractiveness (biolog-

ical sphere), 2) fondness (social sphere), and 3) physical attractiveness, which may be evaluated based on biological ('A' shape) and social-cultural ('H' shape) criteria. It was assumed that shapes that reflect the biological pattern of attractiveness will be rated as lower, given that these significantly respond to the sphere of human sexuality.

These mechanisms seem to be more universal. Reactions to the fear of death can also reflect mood regulation mechanisms that are caused by other unpleasant emotions. An explanation of this process (for e.g., in the context of social assessment of physical attractiveness of others) can be useful, for example, in understanding non-adaptive strategies of emotional control among obese individuals.

Based on the theoretical assumptions and research studies that have been carried out previously, the following hypothesis were adopted: 1) the experimental group will evaluate the presented female silhouettes more critically than the control group; 2) male participants from the experimental group will assess in a particularly negative way the body shapes linked with female sexuality (i.e., type 'A' body shape) on the sexual attractiveness assessment; and 3) female participants from the experimental group will assess in a particularly negative way the female silhouettes in the cultural dimensions (i.e., type 'H' body shape), and in their responses related to liking and physical attractiveness. Finally, 4) the experimental group will evaluate physical attractiveness higher than the control group.

Procedure

The respondents were informed that they would participate in two independent studies. The first one covered memory and the second one covered female physical attractiveness. Initially, the participants were asked to become familiar with the instructions regarding the study on the memory processes. Members of the experimental group read an extract about euthanasia affecting the fear of death, whereas participants from the control group read an emotionally neutral paper. Next, all participants filled out a proper memory test that involved writing adjectives that appeared in the previously read extracts.

Afterwards, the picture *All is vanity* by Charles Allan Gilbert was displayed on a projector to participants, and participants were instructed to indicate the image that they first noticed. The picture presented a skull and a woman's reflection in the mirror simultaneously. Next, photographs of six female body shapes wearing bikinis were displayed, one by one. Three of the photographs illustrated the biological criteria of female attractiveness ('A' shape), and the other three illustrated the social-cultural standard ('H' shape). The respondents were asked to evaluate each of the silhouettes using three scales: 1) sexual attractiveness (biological sphere), 2) fondness (social sphere) and 3) physical attractiveness. Finally, satisfaction with one's own body and mood was measured among the respondents.

Methods

The following tools were used in the research: 1) Memory Test by Łukaszewski and Buczny, 2) Body-Esteem Scale (BES) by Franzoi and Shields [23], 3) the UMACL Mood Adjective Checklist by Mathews, Chamberlain, and Jones, and 4) the Body Shape Attractiveness Questionnaire, which was designed for the purposes of this experiment. The memory test was used to manipulate the awareness of mortality salience. Individuals from the experimental group were reminded about their own mortality by reading an extract about euthanasia. Individuals from the control group read an extract about the stock exchange and stocks, thereby remaining emotionally neutral. The second part of the experiment was a proper memory test. The respondents wrote adjectives which appeared in the previously read extract. The body shape attractiveness questionnaire including a seven degree scale that allowed the respondents to rate the six photographs that represented the female body shapes 'A' and 'H' using the following descriptions: "She is enticing" (i.e., sexual attractiveness), "I like her" (i.e., fondness), and "she is attractive" (i.e., physical attractiveness).

Data analyses

The analysis of obtained data started with the evaluation of the effectiveness of the experimental procedure used, i.e. establishing if the extract of euthanasia activated death-related thoughts effectively. The measure used to establish the degree of mortality salience was noticing the skull first vs. seeing other objects and not noticing the skull in the *All is vanity* picture. A large portion of respondents in the experimental group (wherein death-related thoughts were activated) saw the skull at the first glance (94.11%). In the control group, in contrast, a significant number of respondents saw other objects that were not related to death first and did not notice the skull (84.31%).

The analysis for each variable was conducted in the same manner: (1) a Multivariate Analysis of Variance (MANOVA) with two factors: group (experimental vs. control) and sex (women vs. men); and (2) a one-way ANOVA (experimental vs control group) for females and males, separately.

Results

The evaluation of body shape sexual attractiveness

The analysis of average answers to the question, "To what extent are the presented body shapes sexually attractive", showed that there were no differences between groups, as well no difference in the evaluations made by women and men. There was, however, a significant difference between the evaluation of sexual attractiveness of body shape 'A' (M=5.28) vs. body shape 'H' (M=4.03; $F(1,194)$ =216.41; $p<0.001$; η^2=0.53).

Evaluating the fondness of body shape

The analysis of the evaluation of body shape fondness showed a difference between the experimental (M=4.65) and control groups (M=4.89; F[1,194]=4.17; p<0.05; η^2=0.02), but a lack of significant differences in the evaluation of shape fondness between men and women. There was, however, a significant interaction effect (F[1,194]=4.52; p<0.05; η^2=0.02), such that women whose fear of death was activated liked the presented body shapes less than men in the control group, and vice versa. Men from the experimental (M=4.78) and control groups (M=4.77) like the body shapes to the same degree (p>0.05). The observed overall difference between the experimental (M=4.52) and control groups (M=5.01; F[1,94]=8.93; p<0.05; η^2=0.09) was observed among women. The average evaluation of body shape 'A' among women from the experimental group (M=5.1) was poorer than among women from the control group (M=5.54; p<0.05). Similarly, evaluation of body shape 'H' among women was poorer in the experimental (M=3.94) as compared to the control group (M=4.48; p<0.05).

The evaluation of body shape physical attractiveness

There were significant differences in terms of the evaluation of body shape physical attractiveness between the experimental (M=4.68) and control groups (M=4.95; F[1,194]=5.09; p<0.05; η^2=0.03), but there were no differences in ratings between women and men. Differences, however, were observed between the experimental group (M=4.62) and the control group in women only (M=5.03; F[1,94]=9.73; p<0.05; η^2=0.08). On average, evaluation of the female body shape 'A' was poorer in the experimental group (M =5.22) than in the control group (M=5.56; p<0.05). Similarly, evaluation of body shape 'H' was poorer in women in the experimental group (M=4.04) as compared to women in the control group (M=4.6, p<0.05).

Body image

The analysis of average evaluation in terms of body esteem among women, as measured with the BES, showed a lack of differences between groups. However, there was a statistically significant difference among particular BES subscales (F[2,93]=28.52; p<0.001; η^2=0.38), as well as, an interaction effect between BES and group (F[2,93]=4.95; p<0.05; η^2=0.10).

There were several differences in terms of self-esteem related to body parts and functioning. Women from the experimental group rated lower satisfaction with life strength (M=3.5), energy (M=3.65), and health (M=3.59) as compared to women from the control group (M=4.10; M=4.24, and M=4.10, respectively; p<0.05).

The analysis of average evaluation in terms of body esteem among men showed a lack of differences between groups, among particular BES subscales, and a nonsignificant effect of BES and the group interaction.

Differences in terms of body part and function esteem were observed. The experimental group rated the satisfaction with arms (M=3.97) and legs (M=3.95) higher in comparison to the control group (mean scores respectively: M=3.57, M=3.57; p<0.05), and higher satisfaction with the strength of muscles ($M_{\text{experimental group}}$=3.88, $M_{\text{control group}}$=3.5; p=0.07) but lower satisfaction with libido than the control group ($M_{\text{experimental group}}$=4.17, $M_{\text{control group}}$=4.52; p=0.06).

Mood evaluation

The analysis of main effect of mood indicators showed a lack of statistically difference between the experimental and control groups, but it showed differences among women and men (F[1,191]=3.89; p<0.05, η^2=0.02) and an interaction between group and gender (F[1,191]=8.56; p<0.05, η^2=0.04).

The average rate of hedonic tone in the female experimental group (M=2.86) was lower than in the control group (M=3.18; p<0.05; η^2=0.04). Similarly, the average rate of tense arousal in the experimental group (M=2.33) was higher than in the control group (M=2.12; p<0.05; η^2=0.06). The average rate of energetic arousal in the experimental group (M=2.77) was lower than in the control group (M=3.12; p<0.001; η^2=0.09).

Discussion

The obtained results confirmed the hypothesis that death-related thoughts influence the perception of female body attractiveness. Respondents with an awareness of mortality salience rated the attractiveness of body shapes lower than respondents from the control group. These differences were observed in two out of three examined dimensions. Similar results, determined by sexual intentions, were also obtained in previous research [21,14]. Of note, the body shapes presented in this study were dressed in bikinis and revealed the physical body. Thus, it may be assumed that the body shapes were sexually provocative, which could evoke sexual associations. Grabe and associates [20] showed that an objectifying perception of self was increased among women who were exposed to terror of fear of death relative to women who do not think about death. Men experienced an opposite effect. However, that research study did not confirm the hypothesis that female body shapes are rated lower by men than women from the experimental group.

In contrast to our hypothesis, we did not observe differences in terms of devaluation of body shapes 'A' and 'H' after experiencing mortality salience. In particular, we assumed that the evaluation of body shape 'A' represents a biological pattern of beauty, which determines factors such as sexuality and the animal nature of humans, and body shape 'H' represents a social and cultural standard of beauty, which refers to the widely comprehended worldview as a way to reduce the fear of death. These assumptions were not confirmed.

According to the theory of social comparison, negative evaluation of others is an effective way to maintain self-esteem. This pattern does not appear to apply in the event of mortality salience. Evaluation of one's own body among women, as measured with the BES, was statistically lower when they were experiencing the fear of death. Surprisingly, participants from the experimental group did not show an enhancement in self-evaluation of body image, although previous research suggests that an enhancement is very effective for protecting against the fear of death [5].

It is interesting that the research conducted by Łukaszewski [14] – who, using identical methods and procedures (as described above) except for one difference (i.e., did not include an evaluation of female body shapes) – clearly showed that body esteem, as measured by the BES, increased among both men and women who experienced mortality salience. In our research, we observed an increase in terms of self-evaluation of physicality only among men, and only on select dimensions. Men who were subjected to the experimental manipulation with the fear of death did not show a more critical evaluation in terms of female body shape attractiveness, nor did they show a more positive self-evaluation in terms of select dimensions of body image. There were not any statistically significant differences in the three dimensions of the UMACL scale among men from the experimental vs. the control group. Thus, it may be said that lack of a critical evaluation of others and a positive self-evaluation effectively protects an individual against mood deterioration in the event of experiencing mortality salience. These mechanisms did not apply to women, since they reacted critically to both body shapes in the photographs and their own bodies. Women did not use any of the methods that have been reported in the scientific literature to reduce the fear of death. Women from the experimental group obtained different results than women from the control group, which suggests that they experienced negative emotions (see [13]).

It seems that making a superior social comparison with a relevant object (e.g., a young attractive woman) in the event of mortality salience increases objectification of the female body, which is observed and evaluated negatively and, in turn, escalates negative emotions.

In this case, the fear of death solidified and increased the phenomena that have been described in the context of body image among women, namely: dissatisfaction with appearance, sensitivity to social comparison with the ideal of beauty, or finally, experiencing negative emotions in relation to their own body [24].

Conclusions

The present experiment confirmed the influence of fear of death on the evaluation of cultural and biological standards of female physical attractiveness, as well as, the hesitation of participants' self-esteem and mood related to sex. The lack of critical evaluation of others and a positive self-evaluation effectively protects an individual against mood deterioration, and these effects were observed among men. However, these mechanisms do not apply to women, since women reacted critically to both body shapes in the photographs and their own bodies.

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MINERAL CONTENT OF MENUS OFFERED BY SOCIAL WELFARE HOME

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ABSTRACT

Background: The aging of the population in Poland and globally has increased interest in nutrition for the elderly. Their diets are inappropriate, but modifications should be introduced gradually. This is important in hospital settings, sanatoriums or social care homes, where patients have few choices.

Aim of the study: The study aimed to assess the content of the selected mineral salts in ten day menus offered by the Social Welfare Home based on season of the year.

Material and methods: The study included 40 menus offered in four seasons of the year for the residents of the Social Welfare Home in Lower Silesia. The mineral content of the foods on the menus were assessed. We considered the physical activity of the elderly (1.4—*Physical Activity Level*) using norms developed by the Food and Nutrition Institute, and calculated the average norms of the analysed nutrients for people over 60 years of age.

Results: The diets were low in minerals such as calcium and potassium, and contained an excessive amount of phosphorus, sodium, iron and zinc in all seasons. Although magnesium levels in the spring and summer were appropriate, deficits appeared in autumn and winter diets.

Conclusions: The evaluated menus showed inadequate supplies of the assessed mineral salts. More analysis and adjustments to planned meals is recommended.

KEYWORDS: aged, nutrients, sodium, dietary, zinc, magnesium, food

Background

The aging of the Polish and global populations has increased interest in nutrition of the elderly, also partly due to the realization that proper nutrition can prevent diseases occurring in this age group. Proper nutrition has a strong impact on bodily functions and the natural processes involved [1].

It is widely believed that the diets of older people have serious deficits. It should be underlined that bad eating habits are well-rooted, therefore change may be difficult. Each modification should be introduced gradually, due to reduced adaptability. This is important in hospital settings, sanatoriums or social care homes, where patients have no alternative choices. In many cases these diets' composition or taste are not acceptable by older people [2].

A frequent problem in the geriatric population is limited food and liquid intake. Their diets are also deficient in important vitamins and minerals, resulting in a serious threat to health, because these deficiencies may exacerbate already existing diseases and increase the risk of nutrition-dependent diseases [3].

The elderly is particularly vulnerable to nutrient deficiencies. Loneliness, depression, social isolation and limited income further aggravate inappropriate nutrition [4]. The elderly's diet greatly influences biological aging, and physiological and pathological changes. Significant changes accompanying aging include deterioration of the physiological activities of all organs,

manifested by a gradual loss of water, calcium and phosphorus with simultaneous progressive bone demineralization and deposition of cholesterol and lipid deposits on the walls of blood vessels [5]. Recommendations for adequate consumption of minerals for healthy elderly people are similar to those for younger people with the exception of iron, for which the demand in women after menopause significantly decreases [2].

The nutrition of seniors is often inconsistent with principles of rational nutrition. They require regular consumption of a variety of meals, properly selected and prepared [6].

Aim of the study

To evaluate the content of mineral salts in the selected ten-day menus applied at the Social Welfare Home depending on the season of the year.

Materials and methods

We assessed 40 menus prepared at the Social Welfare Home in Lower Silesia region. Meals were prepared in the facility's canteen. Due to the use of ten-day menus, we examined 10 randomly chosen ones from each season of the year. The research covered the years 2016 and 2017.

We used Diet 5 software to analyse 40 daily meals prepared for the residents of the nursing home consisting of breakfast, dinner, and supper. The mineral salt content was studied. Considering the physical activity of the elderly (1.4 *pal- Physical Activity Level*), using the norms developed by the Food and Nutrition Institute [7], the average norms of the analysed nutrients were calculated for people over 60 years of age. For this purpose, the formula was used, where K is the norm for women, and M the norm for men. The results were compared with the calculated mean values of the norm for the elderly at the level of average consumption (EAR) for the energy value and nutrient content, and an adequate intake (AI) of dietary fibre. The results were statistically analysed giving the mean value (X), median and coefficient of variation (CV). Calculations were made using Microsoft Excel.

Results

The analysis showed significant calcium deficiencies in all seasons. The highest average values were achieved in summer (607.2 ± 135.9 mg) at 61% of requirements.

Table 1. Selected mineral contents in menus from four seasons

SEASON	ASSESSMENT PARAMETERS	MINERAL						
		CALCIUM [mg]	PHOSPHORUS [mg]	MAGNESIUM [mg]	SODIUM [mg]	POTASSIUM [mg]	IRON [mg]	ZINC [mg]
SPRING	X ± SD	588.6 ± 139.4	1223.9 ± 144.9	281.1 ± 64.4	3818.0 ± 888.1	3027.9 ± 652.3	10.8 ± 2.6	10.2 ± 3.1
	Min	413.5	979.0	200.5	2563.6	2045.6	8.9	8.2
	Max	843.6	1448.8	426.9	5256.5	3754.6	17.3	18.8
	Median	565.2	1212.1	272.7	3832.6	3346.2	9.7	9.3
	% of norm	59	211	91	294	64	180	126
SUMMER	X ± SD	607.2 ± 135.9	1245.2 ± 186.6	286.3 ± 59.3	3663.1 ± 773.5	3003.9 ± 544.2	11.8 ± 4.2	10.7 ± 3.6
	Min	312.8	967.9	219.2	2010.7	2206.9	8.2	7.0
	Max	855.9	1615.3	420.6	4387.9	3698.8	22.3	20.2
	Median	605.5	1219.7	279.9	3790.9	3129.7	11	10.3
	% of norm	61	215	93	282	64	197	132
AUTUMN	X ± SD	519.9 ± 114.7	1145.2 ± 187.1	254.4 ± 35.2	6713.0 ± 14.2	2910.2 ± 674.3	9.9 ± 1.1	9.2 ± 1.3
	Min	316.7	889.4	187.9	2141.8	1865.9	8.2	7.7
	Max	754.7	1430.2	313.5	33854.7	3941.5	11.5	11.5
	Median	518.2	1136.7	260.5	3892.2	2866.5	10.0	8.5
	% of norm	52	197	83	516	62	165	114
WINTER	X ± SD	495.5 ± 221.7	1141.2 ± 78.5	260.5 ± 32.1	3939.1 ± 644.2	2934.6 ± 612.5	10.9 ± 2.9	10.1 ± 1.5
	Min	65.1	1008.3	221.9	2911.1	2133.1	8.8	8.0
	Max	845.3	1243.4	313.6	4801.2	3715.5	18.5	12.3
	Median	479.5	1150.4	257.6	4000.6	3139.4	10.2	10.1
	% of norm	50	197	85	303	62	182	125

X-average, SD-standard deviation

In winter, the menu only provided 50% (495.5 ± 221.7 mg) of requirements.

Potassium was also inadequate. In all seasons, consumption was about 60% of daily needs.

Magnesium was provided adequately in spring and summer. However, in autumn (254.4 ± 35.2 mg) and winter (260.5 ± 32.1 mg) deficits were noted, with daily consumption being 80% of daily needs.

Average phosphorus content in the diet was exceeded in four seasons. The highest supply was recorded in the summer (1245.2 ± 186.6 mg), and the lowest in winter (1141.2 ± 78.5 mg).

The recommended amount of sodium was exceeded five times in autumn (6713 ± 14.2 mg), and three times in winter (3939.1 ± 644.2 mg). The lowest average values were observed in summer (3663.1 ± 773.5 mg), which covered 282% of norm.

From the calculated data, we observed that iron and zinc exceeded the requirements for the examined age group. Average iron consumption in summer (11.8 ± 4.2 mg) was highest and amounted to 197% of daily needs, while the lowest amounts were recorded in autumn (9.9 ± 1.1 mg), accounting for 165% of recommended consumption.

Similarly, zinc's highest average consumption also occurred in the summer (10.7 ± 3.6 mg, 132% of norm), and consumption was lowest in the autumn (9.2 ± 1.3 mg) at 114% of requirements.

Discussion

Our quantitative assessment of the examined menus for the selected minerals identified calcium to be significantly deficient during all seasons of the year. Our analysis showed that the residents' diet covered only 50–61% of recommended calcium needs. Studies by many authors analysing food rations and diet [8–11] support this thesis on the insufficient supply of calcium in senior diets. Calcium is not only the basic building block of bones and teeth, but also plays important roles in nerve conductivity, muscle contractility and blood clotting. Therefore, long-term calcium deficiency leads to the development of osteoporosis and the risk of fractures, as well as increased incidence of pain, muscle cramps, and neurological disorders [12].

Phosphorus, like calcium, participates in bone and tooth mineralization. It also plays a significant role in the regulation of the calcium-phosphate economy. We found excessive phosphorus in the menus. Other researchers [10,13,14] have also noted this in their analyses of nutrition of the elderly. Excessive dietary phosphorus limits absorption of calcium, copper, zinc and magnesium, and thus increases further the risk of osteoporosis [12].

Potassium regulates the body's water and electrolyte balance as well as proteins and carbohydrates necessary for metabolism. Our analysis found potassium shortages in the examined menus. Research carried out by Różańska et al [15], Malczyk et al [13], Całyniuk et al [8] and Goluch-Koniuszy et al [14] on elderly nutrition also found insufficient dietary potassium. Long-term potassium deficiency may lead to general muscle weakness and persistent constipation [16].

On the other hand, sodium was excessive in the menus, exceeding norms in all seasons. A similarly high supply of this component was observed by Malczyk et al [13], Goluch-Koniuszy [14] and Całyniuk et al [8]. Excessive sodium leads to disruption of sodium-potassium metabolism of the body, frequently manifesting as oedema. Excessive consumption of sodium chloride further increases the risk of hypertensive disease [16].

Average iron content in the evaluated menus, in turn, was insufficient. In a study evaluating nutrition of retirees for six months by Goluch-Koniuszy et al [14] noted an excess of iron. Excessive dietary iron reduces absorption of zinc and copper, in turn leading to deficiencies [12]. Also, excessive dietary iron contributes to the formation of free radicals, increasing the risk of cancer development [7]. Long-term iron deficiencies further lead to anaemia, that can manifest as cavities in the corners of the mouth, nail fragility and pale skin [12]. Inadequate iron consumption in the ≥60 population was observed by Malczyk et al [13] and Jodłów and Nadziejów.

Zinc is responsible for cell membrane stability, the immune system and taste and smell. Zinc content in the menus exceeded recommended norms. Similar results were reported by Goluch-Koniuszy et al [12]. However, Malczyk et al [13] and Leszczyńska et al [17] found deficient zinc in analysed food rations. Both excessive and deficient dietary zinc may contribute to health deterioration in older people. Insufficient zinc leads to impaired wound healing, taste and smell disorders, and lowers immune responsiveness. On the other hand, excessive zinc may negatively influence iron metabolism of iron and result in iron deficiency [7].

In the examined group of elderly people, dietary magnesium was appropriate in spring and summer, but low in autumn and winter. Markiewicz [1] found similar results in assessment of calcium and magnesium in the diet of elderly people from the Podlasie region. Other authors [8,9,13–15] assessments of both food rations and elderly feeding practices found insufficient dietary magnesium. Insufficient magnesium may contribute to nervous system disorders, impaired absorption and insulin resistance [12].

Conclusions

Elderly diets were generally mineral-poor, particularly for calcium and potassium. They also were excessive in phosphorus, sodium, iron and zinc in all seasons. Although magnesium levels were appropriate in spring and summer, they were deficient in autumn and winter. The evaluated menus showed faulty supplies of assessed mineral salts. Therefore a reassessment of nutritional ingredients in diets for the elderly is required.

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AN ASSESSMENT OF BODY POSTURE OF CHILDREN AGED 3–6 YEARS

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ABSTRACT

Background: A posture defect may be defined as a syndrome of abnormalities occurring in a relaxed upright position of the body. Deviations from the typical body shape are specific for given age and gender. Life determinants and social situation have a very significant impact on the development of body posture in young people.

Aim of the study: The aim of the study was to analyse the occurrence of spinal defects in children aged 3–6 years.

Material and methods: The study included 75 children aged 3–6 years. The children were examined for spinal defects using the MORA computer system.

Results: Boys in the study showed a correlation between height and the inclination of the upper thoracic segment, whereas no such correlation was observed in girls. A significant relationship was also demonstrated between BMI and compensation and inclination of the lumbar segment in all subjects. Overall height was also noted to be significantly related to both spine length and the length of its curvature.

Conclusions: The occurrence of spinal defects is influenced by gender. BMI can have a significant impact on spinal morphology and the formation of body posture, even in pre-school age children.

KEYWORDS: posture defects, spinal defects, children, MORA system, anthropometry

Background

Body posture may be considered as the shape and position of individual segments of the torso and lower limbs in a standing position. Correct body posture depends on the interplay between neuronal, muscular and skeletal systems. At its core is the proper alignment of the spine to the pelvis, with spinal curvature cushioning the load.

A posture defect is defined as a syndrome of abnormalities, or deviations from the typical body shape occurring in a relaxed upright position of the body. Typical body shape varies with both age and gender. Posture defects can cause disturbances in the structure and function of many organs and systems of the human body. For example, they can impair lung function and thus hinder blood supply to the brain. Disrupted cushioning can result in pain and micro-head injuries during walking, running or jumping. Untreated spinal defects reduce the overall fitness and may adversely affect quality of life.

Spinal defects are a common occurrence in young people. Although the most rapid periods of spinal growth are between 6–7 years of age and during puberty [1], developing postural defects can be detected even before this, in children aged 3 to 6 years [2]. It should be remembered that body posture is a reflection of the structure and function of the whole organism [1], with contributions from morphology as well as motor habits [4–6]. Careful consideration of correct body posture has a significant impact on the development of a child, as well as on the life of an adult.

Computerised spinal examination, using the MORA system, is based on anthropometric assessment of surface images. The MORA system produces a 3D spatial image by acquiring multiple reference points across the back of the individual. Analysis of variation between

observed and expected locations creates an elevation map of the examined surface known as the Moire pattern [7].

Aim of the study

The aim of the study was to analyse the incidence of spinal defects in children aged 3-6 years.

Material and methods

The study was undertaken in a group of 75 children aged 3 to 6 years in a private kindergarten in Wrocław. The study group consisted of 41 boys and 34 girls (Table 1). Each child had their spinal morphology analysed by the MORA system, with the results forming the basis of the study.

The study was approved by the Bioethical Committee of PMWSZ in Opole no. KB/33/FI/2017.

The process consists of marking the spinous processes from C7 to S1, the corners of the lower shoulder blades and the spikes of the rear upper iliac on the patient's body.

After marking, the device records images of the patient's spine. These images are correlated with the patient's position to accurately determine posture. Three-dimensional coordinates allow the system to assess posture in frontal, sagittal and transverse planes, with graphical representation of the results.

Statistical analysis was carried out using the Statistica programme (StatSoft, Inc., version 13, USA). The normality of the distribution of all results obtained from patients were compared using the Shapiro-Wilk test, which showed their distribution was not normal. The values measured were compared between the groups with the Mann-Whitney U test, and verified using Spearman's correlation. Significance was taken as $p < 0.05$.

Results

Only results reaching statistical significance ($p<0.05$) were considered in this analysis.

The results presented in tables 2 and 3 show that patient height is significantly related to both total spinal length (Spearman correlation $p<0.0001$) and to length of the spinal curve ($p<0.0001$). This relationship was significant in both males and females.

Our results also demonstrate that the angle of inclination of the upper thoracic segment is significantly related to the height of the individual. As height increases, so does the angle of inclination of the upper thoracic segment. This relationship, however, only reached statistical significance in boys (Table 3). This greater predisposition to the formation of spinal defects in the thoracic segment, may lead to the subsequent development of incorrect posture.

Interestingly, the results have shown that BMI *(Body Mass Index)*, is significantly correlated with both the compensation index and the angle of inclination of the lumbar-sacral segment (Table 4). The higher the BMI, the greater the compensation value and the inclination of the lumbar-sacral segment. This abnormal compensation with increased angle of the lumbar-sacral segment can lead to significant postural defects in the future. This inclination of the lumbar segment is demonstrated to be greater in females than in males (Table 2).

In summary therefore, these results demonstrate that height is related both to overall spine length and

Table 1. Characteristics of patients, p - Mann –Whitney U test.

Variable		Male	Female	p
Number of patients (n)		**41**	**34**	
Age (years)	Median	6	6	
	Range	3–6	3–6	>0.05
Height (cm)	Median	108.0	111.0	
	Range	90.0–149.0	94.0–140.0	>0.05
Weight (kg)	Median	17.0	19.0	
	Range	13.0–39.0	13.0–38.0	>0.05
BMI	Median	15.4	15.8	
	Range	11.5–18.5	13.2–24.3	>0.05

Table 2. Comparison of the results obtained in the Mora system for females and males, p - Mann –Whitney U test.

Variable		Male	Female	p
Number of patients (n)		**41**	**34**	
Length of the spinal curve [mm]	Median	298.6	295.1	
	Range	245.3–395.5	254.5–349.8	>0.05
Height of the spine [mm]	Median	293.5	286.3	
	Range	240.1–379.9	254.5–349.8	>0.05
Inclination of the lumbar-sacral segment [o]	Median	7.5	9.4	>0.05
	Range	1.9–18.0	1.8–23.4	
Inclination of the thoracic-sacral segment [o]	Median	8.6	8.3	>0.05
	Range	3.1–15.9	3.4–12.9	
Inclination of the upper thoracic segment [o]	Median	13.2	13.3	>0.05
	Range	1.1–21.1	3.3–20.1	
Total number of curvatures [mm]	Median	27.9	30.8	>0.05
	Range	20.2–48.0	21.6–45.0	
Torso inclination angle [o]	Median	-1.7	-1.4	>0.05
	Range	-9.9–8.5	-6.8–6.7	
Thoracic kyphosis [mm]	Median	159.8	159.3	>0.05
	Range	151.0–210.0	152.8–206.3	
Lumbar lordosis [mm]	Median	166.1	163.0	
	Range	156.9–206.9	153.2–206.5	>0.05

Table 3. Spearman's rank correlation coefficient.

Spearman correlation		Number of patients n=75		Male n=41		Female n=34	
		Spearman's rank correlation coefficient	Significance level p	Spearman's rank correlation coefficient	Significance level p	Spearman's rank correlation coefficient	Significance level p
Height	Length of the spinal curve	0.75	<0.0001	0.75	<0.0001	0.76	<0.0001
	Height of the spine	0.76	<0.0001	0.75	<0.0001	0.78	<0.0001
	Inclination of the lumbar-sacral segment	0.32	0.005	0.30	>0.05	0.33	0.035
	Inclination of the thoracic-sacral segment.	-0.10	>0.05	-0.02	>0.05	-0.17	>0.05
	Inclination of the upper thoracic segment	-0.21	>0.05	0.01	>0.05	-0.45	0.003
	Total number of curvatures	0.10	>0.05	0.18	>0.05	-0.01	>0.05

Table 4. Spearman's rank BMI correlations.

Spearman correlation		Number of patients n=75		Male n=41		Female n=34	
		Spearman's rank correlation coefficient	Significance level p	Spearman's rank correlation coefficient	Significance level p	Spearman's rank correlation coefficient	Significance level p
BMI	Inclination of the lumbar-sacral segment	0.28	0.015	0.13	>0.05	0.36	0.021
	Inclination of the thoracic-lumbar segment	-0.09	>0.05	-0.07	>0.05	-0.10	>0.05
	Inclination of the upper thoracic segment	-0.08	>0.05	0.10	>0.05	-0.24	>0.05
	Total number of curvatures	0.17	>0.05	0.11	>0.05	0.19	>0.05
	Compensation indicator	-0.26	0.026	0.03	>0.05	-0.46	0.002
	Torso inclination angle	-0.09	>0.05	-0.17	>0.05	-0.03	>0.05

the length of the spinal curve in both males and females. In addition, height is significantly related to the inclination of the upper thoracic segment in boys. Lastly, both compensation and inclination of the lumbar-sacral segment increase with BMI.

Discussion

Postural defects are a major problem both in pre-school and school-age children. Studies have suggested that 50–80% of all children have at least one trait which is a deviation from normal body posture [8]. However, as Maciałczyk-Paprocka et al. [2] point out, the majority of body posture studies have been carried out in school-aged children [9–11]. This study is unusual in focussing on the pre-school age group.

In agreement with our findings, several previous studies have identified the relationship between BMI and postural defects. Barczyk et al. [12], demonstrated a significant relationship between increased BMI and the occurrence of postural defects.

Ostrowska et al. [13] observed a linear relationship between body weight gain and increased lumbar lordosis. The same relationship was presented by Grabara et al. [14], whose studies showed that children with increased BMI, showed a significant deepening of lumbar lordosis compared to their peers with normal BMI.

Bogucka et al. [15] observed that up to 70% of children with a high body weight index show excessive lumbar lordosis.

Finally, Burdukiewicz et al. [16] demonstrated that whilst normal BMI is more frequently associated with normal posture, this deteriorates as BMI rises.

Considering thoracic segment abnormalities, the study conducted by Górniak et al. [17] on a group of boys from rural areas showed a significant degree of thoracic kyphosis. This result correlates with the findings presented above, showing a greater inclination of the thoracic segment in taller boys.

Mieszkowska et al. [18] report that formation of body posture at pre-school age is one of the most important periods of posturogenesis, during which intensive skeletal growth takes place, the proportions of the child's body change and there is an intensive development of the nervous system. There is a phenomenon of "filling" the silhouette related to the growth of both fat and muscle tissue. Yearly height increments are about 5 cm and body weight rises by an average of 2.5–3 kg. Meanwhile, the process of stabilizing the anterior-posterior curvature of the spine is incomplete, due to relatively poor muscle tone stabilizing the spine. In addition, as a result of starting school, their lifestyle also changes. The child forms and perpetuates correct or incorrect motor habits (e.g. as a result

of incorrect habits or environmental influences), developing motor memory. Taken together, these elements significantly influence the developing body posture [19–25].

The compensation index in relation to BMI was presented in the studies by Górniak et al. [17], in which they determined the type of posture based on the compensation coefficient value. It was found that more than 60% of the subjects have type I and II postural kyphosis. The study showed that the BMI value is statistically dependent on the compensation index, but did not confirm that increased BMI parameters are reflected in the compensation index.

Given the importance and frequency of spinal abnormalities, it is important to consider how they can be detected. According to Mieszkowska et al. [18] the assessment of postural defects may be carried out by qualified personnel both with the use of objective tools (computer analysis) and based on subjective techniques (visual comparison with the pattern) [26–29]. However, initial screening assessments of body posture can be carried out by parents or appropriately prepared teachers in kindergarten, with their findings forming the starting point for further research and analysis. Widespread uptake of such initial examinations may help prevent further development of postural and spinal defects.

Conclusions

The results of this study confirmed our initial thesis that spinal defects are commonly found in children aged 3–6 years.

The correlation between the height of the individual and the angle of inclination of the upper thoracic segment was found to be statistically significant only in boys. From the study we can conclude that body growth is important in spine formation. However, our results support the idea that the presence of spinal defects is influenced by gender.

The study also addressed the correlation between BMI and body posture formation in pre-school children. BMI was found to be strongly related to the angle of inclination of the lumbar segment and to spine compensation. This study therefore shows that the structure of the lumbar spine, as well as the index of spine compensation, vary with BMI.

Our findings indicate that even at an early age (3–6 years) there are significant changes in the spine, which affect body posture.

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INTERGENERATIONAL DIFFERENCES IN THE BODY BUILD OF WOMEN

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A – study design, **B** – data collection, **C** – statistical analysis, **D** – interpretation of data, **E** – manuscript preparation, **F** – literature review, **G** – sourcing of funding

ABSTRACT

Background: This study analyzed generational differences in body build of woman.

Aim of the study: The aim of the study was to examine the intergenerational differences in the body build of women.

Material and methods: 90 women (30 female physiotherapy students, their mothers and grandmothers) were examined. Their heights, weights, waist circumferences, and waist and hip circumferences were measured. Their *Body mass index* (BMI) and *Waist to Hip Ratio* (WHR) were calculated. Their frequency of underweight, overweight and obesity were estimated. WHO criteria were applied. The results were subjected to statistical analysis. Descriptive statistics were calculated. The Shapiro-Wilk test for testing the normal distribution was used. The Kruskal-Wallis test and post-hoc test were used. A significance level alpha of 0.05 was assumed. Statistica 13.1 was used for calculations.

Results: The median body height of the female students was 166.8 cm, their mothers 160.8 cm, and grandmothers 158.0 cm. Their median body masses were, respectively: 59.4 kg, 70.1 kg and 72.5 kg. Their median BMIs were 21.4 kg/m^2, 26.3 kg/m^2, and 29.2 kg/ m^2, and their WHRs were 0.80, 0.86, and 0.87, respectively. Underweight was only seen in students (13%). The prevalence of overweight female students (BMI ≥30) was 10%, their mothers 33% and their 13% grandmothers, whereas obesity was 7%, 30% and 50%, respectively.

Conclusions: There were intergenerational differences in the body structure of women. In subsequent generations, the size of the body increased, and height of the body decreased. There were differences between mothers and offspring. From an early age, body growth should be monitored to prevent obesity development with age.

KEYWORDS: intergenerational differences, women, body build

Background

Changes occur to a person's body throughout their lifespan. These changes affect all organs, their composition and proportions. At different life stages, height, body mass, and adipose tissue change. In females, body fat increases, particularly around the hips, buttocks and thighs, varying depending on physical activity, diet and genetic predisposition up to approximately 60–70 years of age [1]. Relative stabilization in adipose tissue can be observed in adults.

Aging is a physiological process influenced by environmental and genetic factors. The aging process is inextricably linked to changes in body fat, its distribution and lean body mass, reduction in body height, and altered proportions, declining muscle strength, balance and metabolism, as well as dysfunction in internal organs [2–4].

Obesity is becoming a global epidemic. According to the World Health Organization (WHO), 1.6 billion people have elevated body mass index, while 522 million people are obese. The number of obese adolescents has tripled in recent years, and 400,000 new cases among children and adolescents are reported annually. In Poland, excessive body mass among children is trending upward. Also, based on research published in 2005, over 20% of adults suffer from obesity [1,5].

Obesity relates to high levels of body fat (in men, over 25%, in women over 30%). Overweight and obesity

contribute to impaired body function, development of chronic diseases and, as a consequence of these, a significant decrease in life quality [5–7]. It is also associated with increased risk of premature death, heart disease, stroke and disability. However, research conducted among the elderly population is not always unambiguous. Epidemiological data suggests that overweight and first-degree obesity are associated with a minimal risk of seniors' death, and underweight increases mortality risk for older people [8,9]. The currently recommended values of body mass index, waist circumference and obesity threshold for the general adult population may be inappropriate for older people [10].

BMI has been shown to be the best predictor of total adipose tissue content and distribution [11–13]. Besides BMI, WHR is another indicator that describes obesity type and illustrates fat distribution [1,14].

Aim of the study

Our aim is to examine the intergenerational differences in women's body build.

Material and methods

Participants: 90 women, including 30 physiotherapy students in Opole Medical School, their mothers and grandmothers were examined. The mean of the female students' age was 21.9 ± 0.89 years, their mothers' was 48.4 ± 5.40 years, and their grandmothers' was 73.2 ± 6.32 years.

Prior to the study, all subjects were informed of the principles and purpose and expressed written consent to participate. The Bioethical Commission at the Opole Medical School in Opole approved of the study, and the Dean of the Faculty of Physiotherapy gave permission.

Techniques and measurements: using standard anthropometric techniques, the following were measured: body height (B-v) measured with the Martin technique, height measured with an anthropometer to an accuracy of 0.1 cm, with the subject standing upright, upper limbs lowered along the torso, lower limbs upright, compact, with head set in the Frankfurt plane. Height was the determined distance between the points basis (B) and vertex (v). Weight was measured on an electronic scale with an accuracy of 0.1 kg. Waist circumference was measured with a metric tape to the nearest 0.1 cm, midway between the lower rib margin and the iliac crest, with the participant asked to breathe normally. The reading was taken at the end of light exhalation. Hip circumference was measured with a metric tape to the nearest 0.1 cm, with a tape placed around the point with the maximum circumference over the buttocks below the ala of ilium. All measurements were carried out on the same weekday (Monday), in the morning, with the participant dressed in underwear and without shoes.

The BMI (*Body Mass Index*) was calculated as body mass in kilograms divided by the square of body height in meters. The WHR (*Waist to Hip Ratio*) was calculated as waist circumference divided by the hip circumference. Frequency of underweight, overweight and obesity among the examined women was estimated. WHO criteria were applied [5,15].

According to the *World Health Organization* (WHO), a healthy WHR is 0.85 or less for women. In both men and women, a WHR of 1.0 or higher increases the risk of heart disease and other conditions associated with being overweight.

Statistical methods

The results were subjected to statistical analysis. The Shapiro-Wilk test determines if a random sample comes from a normal distribution. When the results were significant, it implied the distribution was non-normal. Descriptive statistics (median, standard deviation, coefficient of variation, minimum and maximum value) were calculated. In later analysis, we used the Kruskal-Wallis post-hoc test. A significance level of alpha 0.05 was assumed. Statistica 13.1 was used for calculations.

Results

The median of body height (BH) of female students (s) was 166.8 ± 6.0 cm, their mothers (m) 160.8 ± 7.4 cm, and grandmothers (b) 158.0 ± 6.3 cm (fig. 1). The students had the highest median height, and their grandmothers had the shortest. Differences were statistically significant between students and their grandmothers (p=0.000151).

The median of body weight increased with each older generation. The median body mass of female students was 59.4 ± 12.1 kg, their mothers 70.1 ± 11.6 kg, and their grandmothers 72.5 ± 15.5 kg (fig. 2). As with body height, statistically significant differences in body mass were noted between students and their mothers (p=0.003658), and between students and their grandmothers (p=0.002646).

The median BMI of female students is 21.4 ± 3.9 kg/m^2, mothers (BMI=26.3 ± 3.6 kg/m^2) and grandmothers (BMI=29.2 ± 5.5 kg/m^2). With age, the percentage of women with a normal BMI decreases (fig. 3). Statistically significant differences occur between female students and their mothers (p=0.000137) as well as between students and their grandmothers (p=0.000001)

The median waist circumference tended to increase in subsequent generations (fig. 4). In the students, the median was 71.5 ± 10.8 cm, the mothers was 87.2 ± 10.3 cm, and grandmothers was 92.5 ± 13.9 cm. Statistically significant differences were found for all groups of women (mother-student p=0.000066, student-grandmother p=0.000001, mother-grandmother p=0.000385).

The median hip circumference of female students was 91.0 ± 11.2 cm, the mothers' was 101.5 ± 10.5 cm, and the grandmothers' was 105.8±14.1 cm (fig. 5). Sta-

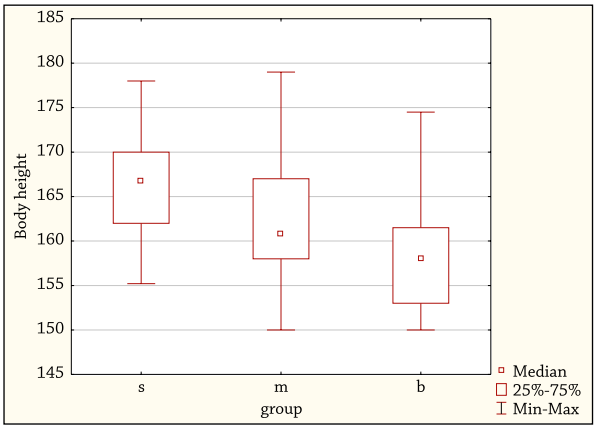

Figure 1. Body height (BH) – intergenerational differences [cm]

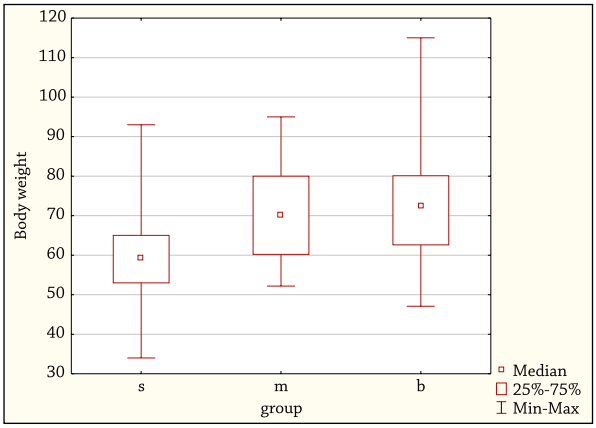

Figure 2. Body Weight (BW) – intergenerational differences [kg].

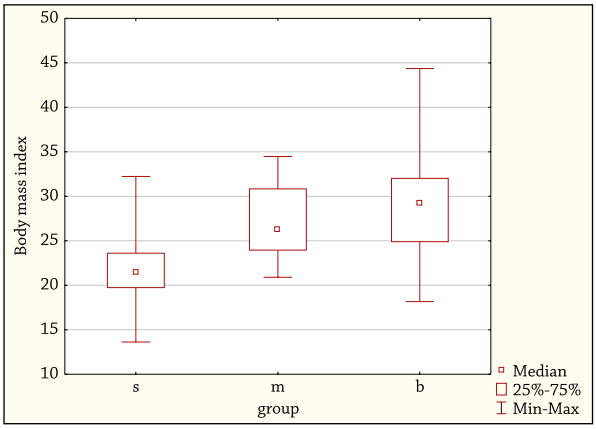

Figure 3. Body mass Index (BMI) – intergenerational differences [kg/m2]

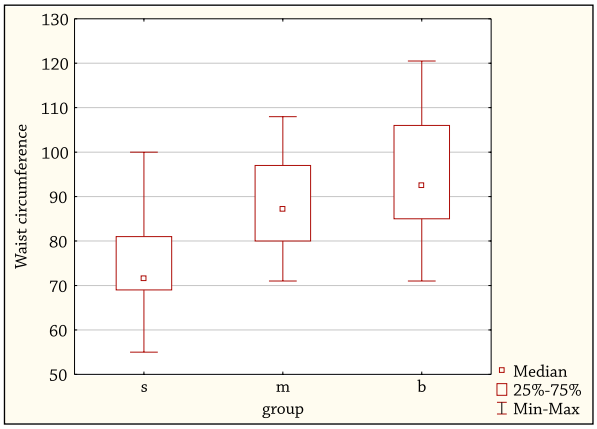

Figure 4. Waist circumference – intergenerational differences [cm]

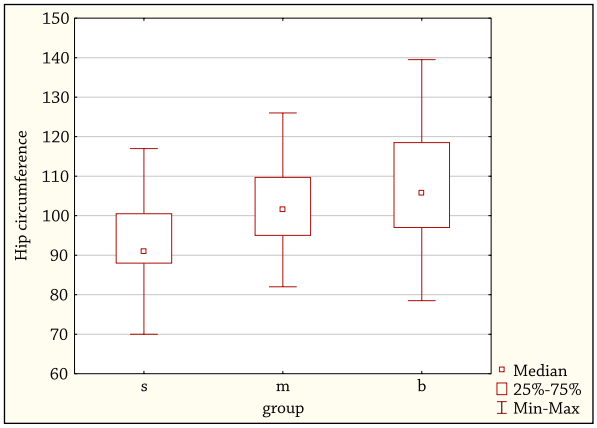

Figure 5. Hip circumference – intergenerational differences [cm]

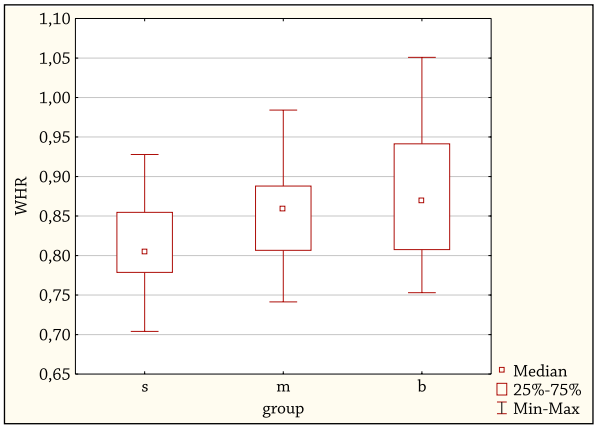

Figure 6. WHR - intergenerational differences

tistically significant results were found between female students and their mothers (p=0.03853), and students with their grandmothers (p=0.000049).

The median WHR value of female students was 0.80 ± 0.1, mothers was 0.86 ± 0.1, and grandmothers was 0.87 ± 0.1 (fig. 6). Mothers and grandmothers exceeded the norm. Statistically significant results were found for students and their grandmothers (p=0.004730).

About 2/3 of students have normal weight, >12% were underweight, 10% overweight and 7% obese. 37% of their mothers had normal weight, 33% were overweight and 30% obese. For the grandmothers, only 37% of respondents had normal weight, 13% were overweight, and half were obese. None of the mothers or grandmothers were underweight. The number of overweight and obese women increased with each generation. In other words, fewer grandmothers have normal weight proportions and none of them are underweight. Statistically significant results were seen for students and their grandmothers (p=0.00012).

Table 1. Frequency of underweight, normal, overweight and obesity.

Category	numbers/ percent	Students	Mothers	Grandmothers
underweight	n	4	0	0
	%	13.33%	0.00%	0.00%
normal	n	21*	11*	11*
	%	70.00%*	36.67%*	36.67%*
overweight	n	3	10	4
	%	10.00%	33.33%	13.33%
obesity	n	2	9	15*
	%	6.67%	30.00%	50.00%*
Total	n	30	30	30

*Chi^2 Pearson: Chi^2 =27.47922, df=6, p=0.00012

Discussion

In recent years, many scientific researchers from different countries have studied the somatic features of people due to increasing BMIs and WHRs and their associated diseases. Obesity and overweight have become very common, and this trend is evident in all age groups. Overweight is caused by a combination of environmental factors such as poor diet and genetic factors.

On the basis of the BMI index, by means of which the weight-increase norms are estimated, one can compare differences in body structure between particular age groups. The female students had a median BMI of 21.4 kg/m^2 in the normal range. However, their mothers and grandmothers had elevated median BMIs of 26.3 kg/m^2 and 29.2 kg/m^2 respectively. These median results of mothers and grandmothers were in the overweight range.

Skrzek *et al.* found that seniors from Lower Silesia had average BMI results in the overweight range, 28.26 kg/m^2 for women who do not participate in the study at the University of the Third Age (UTW) and 27.63 kg/m^2 for UTW members. The examined women had lower WHR rates of 0.85 and 0.84, respectively [16]. The average BMI of a cohort of Brazilian women aged 60–79 was also in the overweight range [17].

We found similar increases in BMI index with age. We examined people aged <40 years, 40–60 years and> 60 years. In the youngest group, almost half of the respondents had normal body mass. In this group, the smallest percentage of people with obesity was recorded—around 25%. In the group aged 40–60, about one third of the respondents had a normal BMI, while the percentage of people with obesity increased to about 40%. In the oldest group, only about 25% of respondents had normal BMI, and half of the subjects were obese [15].

Some researchers consider that calculating the BMI index for older people using body height is misleading. Yilmaz *et al.* propose that arm length should be used instead [18]. Others have published similar BMIs to those described here. The average BMI for Poznań students in 2012 was 21.7 kg/m^2. 13% were underweight, 7% overweight, and 1.5% obese [19]. Girls studying medicine in Radom, in 2014 showed an average body mass index of 21.8 kg/m^2 [3]. In Sweden, 27% of women were overweight, and 11% were obese. In Switzerland, 21% were overweight and 8% obese. Based on these results, Poland has among the highest BMIs in Europe [10].

Conclusions

We found intergenerational differences in women's body structures. With each generation, body size increased, and height decreased. Differences were seen between mother and offspring. A more detailed analysis of data over three generations is warranted to understand the nature of the differences. From an early age, body growth should be monitored to prevent the occurrence of overweight and obesity in adulthood and old age.

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Case reports

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THE USE OF COMBINATION THERAPY WITH 20% GLYCOLIC ACID AND FRACTIONAL MESOTHERAPY TO REDUCE ACNE SCARS: A CASE REPORT

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ABSTRACT

Background: Acne scars are a common problem for those suffering from acne vulgaris. They may result in low self-esteem, especially if located in visible places such as the face. They may even impede normal societal functioning and withdrawal from the environment.

Aim of the study: To investigate the effects of 20% glycol acid and fractional mesotherapy on the reduction of acne scars.

Material and methods: We used interviews, case analysis and assessment of the effects of glycolic acid treatment and fractional mesotherapy on a 33-year-old female patient who experienced severe phlegmonosa acne.

Case report: This 33-year-old female patient was struggling with acne at age 29. Purulent cysts were located on the cheeks and jaws on both sides of her face, leaving deep scars that disturbed everyday functioning. She was alternately given four 20% glycolic acid treatments and four fractional mesotherapy treatments.

Conclusions: The combination of fractional mesotherapy treatments and exfoliation with 20% glycolic acid resulted in significant improvement. Reduced inflammation contributed to decreased acne scars as well as improvement in life quality.

KEYWORDS: scars, AHA, fractional mesotherapy

Background

Acne is a dermatological disease most frequently seen in 11–30 year-olds [1]. The underlying causes of acne have been proposed in the literature to include:

- excessive production of sebum
- increased keratosis of the sebaceous glands
- inappropriate bacterial flora
- hormones
- a diet rich in simple sugars, fat and spice
- psychological factors [2,3]

Interestingly, intestinal dysbiosis, namely, inappropriate intestinal bacterial flora composition and leakage of the intestinal walls, has been posited to contribute to acne [4]. The last two factors, diet and psychological factors such as chronic stress have been speculated to play a significant role. The Polish Dermatological Society therefore recommends patients undergoing skin treatment have a diet with low glycemic index. Measurement of the following is also recommended:

- testosterone
- dehydroepiandosteronesulphate (DHEAS)
- LH/FSH ratio

In addition, acne lesions such as pustules, tumors, fistulas and cysts can lead to decreased quality of life and make normal functioning in society more difficult. Chronic stress can be a causative or exacerbating factor and may relate to the presence of neuropeptide receptors on cells of the immune system, as well as the production of cytokines affecting brain function [5–7].

Of great importance in acne treatment is the selection of the appropriate dermatological treatment, which in acute cases is usually 13-cis-retinoic acid otherwise known as isotretinoin, and which reduces sebum secretion, inflammation, colonization of the pilosebaceous

unit and blackhead formation. It has been shown to result in less severe disease relapses. Until recently, it was thought that supportive treatment was unnecessary. However, local application of retinoids for 6 months 2-5 weeks after the initial treatment course is recommended [8,9].

After finishing an isotreninoin treatment, patients must wait at least half a year if they wish to undergo exfoliation, laser or microfracture surgery, as well as aesthetic medicine or plastic surgery treatments.

Aim of the study

This work's aim is to demonstrate that the cosmetology treatment exfoliation with glycolic acid can synergize with fractional mesotherapy to reduce deep acne scars.

Material and methods

We used interviews, case analysis and assessment of the effects of glycolic acid treatment and fractional mesotherapy on a 33-year-old female patient who experienced severe phlegmonosa acne.

Case report

This 29 year-old female patient exhibited severe acne thought to have been caused by severe long-lasting stress. Pustules on the temples, cheeks, and lower jaws evolved into cysts and fistulas and were associated with great pain. They further hindered normal functioning in everyday life (including work). The patient manually removed them, as acne sufferers often do. In addition, the desire to cover the changes forced the patient to apply a double layer of primer, further hindering skin breathing and clogging skin pores. In 2014, isotretinoin treatment was begun for 8 months, resulting in elimination of acne lesions. However, on the temples, cheeks and jaws scars resulting from cysts, as well as fistulas, remained. After 4 months of taking isotretinoin, the patient's skin condition improved significantly. At age 33, the patient decided to use combination therapy, consisting of exfoliation with 20% glycolic acid and fractional mesotherapy.

Results

The patient underwent a series of treatments using 20% glycolic acid (pH 2.8) as well as fractional mesotherapy combined with organic silica. Written approval for the procedure, photos and consent of the Bioethical Commission of Public Higher Medical Professional School in Opole were obtained (consent number 14/2018). All contraindications (including pregnancy, lactation, keloid tendencies, anticoagulants, active viral, fungal, bacterial infections, oral steroid therapy, oral isotretinoin, active form of acne) were excluded, minimizing the risk of post-procedural complications. The depth of scars was assessed using the Goodman and Baron scales. The patient was diagnosed with 3rd grade acne according to the above-mentioned scale, meaning that the changes were difficult to cover using makeup (tab. 1). The series included 8 treatments alternating every two weeks for skin regeneration. The first treatment of glycolic acid was applied for 40 seconds, with subsequent skin acid exposures lasting 30 seconds. Glycolic acid 20% pH 2.8 is a strong irritant and sometimes causes bleeding. The acid was always neutralized with a neutralizer to prevent deeper penetration into the skin. After the treatment, a strong regenerating cream was applied, allowing for quicker epidermal reconstruction. After the surgery, the appearance of serous fluid was visible on the treatment day, and scabs and epidermal exfoliation appeared on the second day after treatment, lasting for up to a week. Fractional mesotherapy with organic silica was given alternately with acids every two weeks, and resulted in shallower scars. The treatment consisted of a special device, into which a disposable cartridge with 9 sterile needles was inserted, and a skinprick. Before the facial treatment, an anesthetic preparation was applied while the patient lay for 30-40 minutes (under the occlusion - food foil), which reduced pain. During treatment, bleeding occurred, probably due to growth factor release resulting in collagen remodeling and subsequent improvement of the patient's skin structure.

The scars were reassessed after the treatment series. According to the Goodman-Baron scale, the scars were shallower up to the 2nd grade, implying that the glycolic acid treatments had synergized with fractional mesotheraphy to the patient's benefit.

Tab. 1. Assessment of atrophic scars in the Goodman-Baron scale.

Grade 1	Macular edema or discoloration.
Grade 2	Mild atrophy is not visible at distances >50 cm, easy to cover with face makeup or with the help of a beard.
Grade 3	Moderate atrophy visible at distances >50 cm; it is not easy to cover with makeup or with the help of a beard, changes flatten when manually stretched.
Grade 4	Severe atrophy, changes do not flatten when manually extended.

Discussion

Glycolic acid treatments are widely used and often performed by cosmetologists to reduce acne scars. However, fractional mesotherapy has recently gained in popularity due to its effect on growth factor release by the skin, stimulating and increasing collagen and elastin synthesis, supporting cell health, and stimulating cell growth and division. Combination treatment results in very good shallowing of acne scars. The synergy gives much better results than the performance of the treatments individually. Sharad conducted research

on a group of 30 patients with acne scars divided into two groups. The first group was subjected to microcutting for 6 weeks, and the second one to treatments with 35% glycolic acid. They found that both microcutting and exfoliation with acids gave excellent results for the acne scars. Skin structure improved, and acne lesions (scars) were shallower. However, microcutting alone gave better results in making the scars less shallow than a separate acid procedure [10].

Rana et al. investigated the effect of microcutting in combination with 70% glycolic acid and microcutting on a group of 60 patients with acne scars. They showed that the combination of acids and microcutting gave better results than microcutting on its own [11].

Conclusions

The use of combination therapies, in this case, exfoliation with 20% glycolic acid and fractional mesotherapy, resulted in very good and positive therapeutic effects. The decreased inflammation resulted in better and faster regeneration of the skin, flattened acne scars, and improved skin structure, as quantified by the Goodman-Baron scale.

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DOES HORMONE REPLACEMENT THERAPY BENEFIT POST-MENOPAUSAL WOMEN? – A SCOPING REVIEW

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ABSTRACT

Post-menopausal women experience symptoms such as irregular periods, lower fertility, vaginal dryness, hot flashes and night sweats. Hormone replacement therapy (HRT) relieves menopausal symptoms. The aim of this review was to assess the benefits and risks of HRT in post-menopausal women. A scoping review was conducted for original peer-reviewed English language papers using the electronic databases of PUBMED, JAMA, BMC and TRIP. The papers were subjected to a three-stage screening process. The type of study, year of study, age, participants, type of therapy and the aim of the study defined the inclusion and exclusion criteria. HRT was associated with reduced risk and prevalence of end-stage kidney disease, gastric esophageal reflex disease (GORD) symptoms, periodontal disease and associated with the increased risk of overall cancers. The benefits of HRT depend on the duration of therapy, formulation, route of administration, time of initiating therapy (age <60 years) and type of therapy. Post-menopausal symptomatic women mostly benefited with hormone replacement therapy. To reduce risks of adverse events, HRT should be initiated with appropriate monitoring.

KEYWORDS: hormone replacement therapy, benefits, risks, estrogen, progesterone

Background

Women between the ages of 47 and 53 years undergo an important life-transitioning phase called menopause. The symptoms of menopause include irregular periods, lower fertility, vaginal dryness, hot flashes, night sweats, disturbed sleep, urinary problems, emotional changes, problems focusing and learning, and other symptoms [1-3]. Recent experimental and clinical studies have indicated that the effects of HRT depend on the estrogen and progesterone formulation, dosage, mode of administration, patient's age, associated diseases, and duration of treatment [4, 5]. Several studies reported that mortality from all causes was lower in HRT users than in non-users [6, 7]. The purpose of this review was to evaluate whether postmenopausal women derive benefit from the HRT.

Methodology

A scoping review was conducted to establish the nature and distribution of studies relevant to the research question. This review identified search four domains; postmenopausal women, 'Hormone replacement therapy, benefits and risks. The electronic databases of PUBMED, JAMA, BMC and TRIP were searched for original peer-reviewed English language papers from January 2008 to July 2018. The search period was chosen to include the time frame during which changes were made in excluding the association between benefits and risks while giving HRT to post-menopausal women. Eligibility criteria were framed to exclude irrelevant studies (tab. 1).

Screening

An initial database search generated papers which were subjected to a three-stage screening process. In the

Table 1. Inclusion and exclusion criteria for articles

Parameter	Inclusion	Exclusion
Type of study	RCT, cohort studies, meta-analysis, systematic review	Cross-sectional study, case-control study
Year of study	2008-2018	Studies published before 2008
Aim	To assess the benefits and risks of HRT	Other aspects of hormone replacement therapy
Age (years)	45-65	<45 or >65
Type of article	Research	Abstracts, letters to the editor, short communications, case reports, case series
Participants	Post-menopausal women	Men, others
Type of therapy	Both mono and dual therapy	Nil
Language	English	Other

first stage, ineligible or duplicate titles were excluded during title screening, leaving the remaining titles which were subjected to abstract screening. The content of the abstracts was screened in the second stage to assess its applicability to the inclusion criteria. Where it was not possible to determine this from the level of detail in the abstract, the full paper was read and subjected to the inclusion and exclusion criteria. In the third stage, the full papers were screened for eligibility and the reference lists of the studies included were hand searched for additional papers, which resulted in no further additions to the final number of papers determined relevant to the review.

Discussion

Benefits of HRT

Table 2 depicts the benefits of HRT. HRT benefits postmenopausal women by reducing the risk of disease development. However, the benefits of the therapy depend on the duration of therapy, formulation, route of administration, time of initiating therapy (age <60 years) and type of therapy. Studies have suggested that transdermal estrogens might be safe with respect to thrombotic risk [8, 9]. The long-term use of estrogen with or without progestin was likely to be associated with a reduced risk of osteoporosis, improvement or stabilization of bone density [10, 11] and ischemic heart disease (IHD) [12]. Data from the largest randomized clinical trial (RCT) to assess the impact of HRT on cardiovascular (CV) outcomes, the Heart Estrogen Replacement Study (HERS) reported a null effect, with an increase in cardiovascular mortality in first 12 months and a reduction thereafter [13]. Estrogen and progestin reduces vasomotor symptoms, depression [14], cognitive functioning [16] and sleep disturbance [17, 18] and improves sexual functioning [15].

Carrasquilla et al [19] reported that the initiation of HRT 0±5 years after the onset of menopause, as compared to never used, was associated with a decreased

Table 2. Studies that reported benefits of hormone replacement therapy

Author & year of publication	Age of patients (in years)	Duration of therapy (in years)	Type of therapy	Benefits reported
Carrasquila et al., 2017 [19]	Early HT initiation: Age at Baseline- 58.8 (54.8–60.5) Age at Menopausal Onset - 50.2 (48.0–53.0) Late HT initiation: Age at Baseline- 64.9 (60.0–70.2) Age at Menopausal Onset- 49.7 (46.0–52.0)	14.3	OE, CH	Initiation of HRT 0 ± 5 years after menopause onset, as compared to never used, was associated with a decreased risk of stroke and hemorrhagic stroke.
Simin et al., 2017 [20]	≥ 40	7	OE, CH, OP	HRT decreased the risk of gastrointestinal cancers.
Hale et al., 2015 [21]	---	---	---	HRT may play a role in primary CVD prevention if initiated within 10 years of menopause and at less than 60 years of age.
Gleason et al., 2015 [22]	OCEE - 52.8 (2.7) t-E- 52.6 (2.6)	CO- 2.85±0.49 M0- 2.76±0.57	OCEE, t-E	Extended therapy benefits for mood and vasomotor symptoms.
Close et al., 2012 [23]	OE - 52.6±7.23 CH- 50.9±5.54 OP- 49.1±5.44	5.4	OE, CH, OP	Use of monotherapy decreased GORD symptoms.
Evalt et al., 2011 [24]	ERT- 61.6±6.1	-	CEE	Estrogen administration was safe for short-term use and may result in an improvement of motor symptoms.
Canonico et al., 2010 [25]	54.0(4.3)	10.1	CEE, CH	Short-term use of transdermal estrogens alone or combined with progesterone could be an option in the management of postmenopausal symptoms.
Tarkkila et al., 2010 [26]	55.4±2.7	2	---	HRT use decreased periodontal infections.
Vickers et al., 2007 [27]	62.8	1	CEE, OP	Reduced risk of osteoporosis and ischemic heart disease.
Seed et al., 2000 [28]	58.2±6.7	3 months	OE, CH, OP, Androgen	HRT reduced CV risk factors in post-menopausal women with risk of CAD and also protected from osteoporosis.

OE - Only estrogen, OP - Only progestogen, CH - Combined hormone therapy, HT - Hormone therapy, CO - Cognitive outcomes, MO - Mood outcomes, OCEE - Oral conjugated equine estrogens, t-E - Transdermal estradiol, ERT - Estrogen replacement therapy, MPA - Medroxyprogesterone acetate.

risk of stroke and hemorrhagic stroke. Based on the type of therapy, if single conjugated equine estrogen (CEE) was used, late initiation was associated with a shorter stroke-free (fifth percentile differences [PD], –4.41 years; 95% CI –7.14 to –1.68) and hemorrhagic stroke-free (first PD, –9.51 years; 95% CI –12.77 to –6.24) period than never used. Simin et al [20] reported that HRT reduced the risk of gastrointestinal cancer. The risk of all gastrointestinal cancers was decreased (SIR Z 0.90, 95% CI: 0.86-0.94). Hale et al [21] reported that HRT may play a role in primary cardiovascular disease (CVD) prevention if initiated within 10 years of menopause and at less than 60 years of age. Gleason et al. reported that, in women with a mean age of 52.8 (2.7) using oral conjugated equine estrogen (OCEE) and those with a mean age of 52.6 (2.6) using transdermal estradiol (t-E), HRT improved mood and decreased vasomotor symptoms. Close et al [23] reported that there was an independent association between HRT and risk of GORD symptoms and that estrogen decreased the risk of GORD compared to progesterone. This association remained statistically significant for estrogen-only treatment (OR 1.49; 1.18–1.89). Evalt et al [24] reported that estrogen administration was safe for short-term use and may result in an improvement of motor symptoms in women with a mean age of 61.6±6.1years.

Canonico et al [25] reported that oral estrogen increased the risk of venous thromboembolism, especially during the first year of treatment, whereas transdermal estrogen did not. Tarkkila et al [26] reported that HRT use for a duration of 2 years decreased periodontal infections in women with a mean age of 55.4±2.7 years. Vickers et al [27] reported that long-term use of estrogen was likely to be associated with a reduced risk of osteoporosis and ischemic heart disease. Concomitant use of progesterone has been shown to protect against endometrial cancer. The drugs and doses given were conjugated equine estrogens 0.625 mg orally daily; conjugated equine estrogens plus medroxyprogesterone acetate 2.5/5.0 mg orally daily; matched placebo. Seed et al [28] reported that all HRT regimens lower low-density lipoprotein cholesterol and reduced cardiovascular risk factors in post-menopausal women with risk of coronary artery disease (CAD).

Risks of HRT

Table 3 summarizes the risks of HRT. Some of the most serious adverse effects of postmenopausal HRT in the general population are venous thromboembolism (VTE) and breast, ovarian, and endometrial malignancy [29]. Studies have shown breast cancer and endometrial cancer risk is greater if therapy is

Table 3. Studies that reported risks of hormone replacement therapy

Author name & Year of publication	Mean age of patients (in years)	Duration of therapy (in years)	Type of therapy	Risks
Dumanski et al., 2017 [35]	---	---	---	Women with chronic kidney disease are at increased risk of VTE and cancer
Simin et al., 2017 [20]	40	7	OE, CH, OP	A slight increase in overall cancer risk among HRT users, mainly cancer of the female reproductive organs.
Gleason et al., 2015 [22]	OCEE - 52.8 (2.7) t-E- 52.6 (2.6)	CO- 2.85±0.49 M0- 2.76±0.57	OCEE, t-E	Risk of breast cancer is seen unless given in a low dose for a brief period
Chlebowski et al., 2015 [36]	CH- 63.2±7.1 CEE-63.6±7.3	CH/placebo- 5.6 CEE/placebo- 7.2	CEE, CH	Estrogen plus progestin was associated with greater breast cancer incidence and mortality.
Tranah et al., 2010 [37]	CU- 82.9±3.4 PU- 83.8±3.4	4 consecutive 24hrs period	CEE, CH, OP	Vascular side-effects of HRT may exceed its beneficial effects on sleep
Beral et al., 2015 [38]	-	PS- 6 RS- 4	CEE, CH	Increase in ovarian cancer risk.
Nordenvall et al., 2014 [39]	PU- 64 CU- 60	14	-	Use of HRT may increase the risk of cholecystectomy.
Farhat et al., 2013 [40]	64.3±6.8	5.6	CH	Women with lower dose E + P treatment were at greater risk of breast cancer.
Engel et al., 2011 [41]	53.8	11.5±4.4	-	Short duration, whatever the progesterone or route of administration, does not reduce the risk of fracture over the medium or long term.
Cravioto et al., 2011 [42]	47.4±7.4	2	CH	Risk of developing thrombosis
Vickers et al., 2007 [27]	62.8	1	CEE, OP	Increased risks of breast and endometrial cancer.
Cirillo et al., 2005 [43]	CH- 63.1±7.1 CEE- 63.4±7.2	CH- 5.6 CEE- 7.1	CH, CEE	Increase in risk of biliary tract disease among postmenopausal women using estrogen therapy.
Shumaker et al., 2004 [44]	-	CEE- 5.21±1.73 CH- 4.05±1.19	CH, CEE	Increased risk of dementia and MCI in the estrogen alone and estrogen plus progestin trials among women between 65 and 79 years of age.
Rossouw et al., 2002 [30]	63.2±7.1	5.2	CH	Overall health risks exceed benefits with the use of combined estrogen plus progestin and this regimen should not be initiated or continued for the prevention of CHD.
Nelson et al., 2002 [45]	CU- 69.3 PU- 70.9 COU- 70.7	10	CEE	Prolonged postmenopausal estrogen use provided incomplete protection against osteoporotic fractures and women having osteoporosis who are at high risk of fractures.

CU- Current users, PU- Past users, COU- Continuous users, CH- combined hormone therapy, CEE- conjugated equine estrogens, CHD chronic heart disease.

initiated around the time of menopause [29,30-31]. A systematic review based of 10 RCT's concluded that oral HRT in postmenopausal women increases the risk of stroke [32] and coronary heart disease [33]. Data from the Women's Health Initiative (WHI) showed that HRT increased the risk of myocardial infarction, breast cancer, stroke, and blood clots [30,34].

Dumanski et al [35] reported that women with chronic kidney disease are at increased risk of VTE and cancer, both adverse effects of postmenopausal hormone therapy. Simin et al [20] reported that HRT causes a slight increase in overall cancer rates, mainly due to an increased risk of cancer of female reproductive organs. Ovarian cancer ranks as the sixth most common cancer and the seventh major cause of cancer death among women. The risk for invasive breast, endometrial or ovarian cancer combined was increased for any HRT, particularly Estrogen-Progestin -HRT (SIR Z 1.31, 95% CI: 1.28-1.34) and relative risk (RR) of 1.24; 95% confidence interval [CI] 1.15–1.34) from cohort studies and a summary odds ratio [OR] of 1.19 (95% CI 1.02–1.40) from case-control studies compared to never used HRT. Gleason et al [22] reported that an increased risk of breast cancer in women taking CEE with a mean age of 52.8 (2.7) and in those taking t-E with a mean age of 52.6 (2.6) was seen unless HRT was given in a low dose for a brief period. Chlebowski et al [36] reported that, in patients given estrogen plus progesterone, the incidence of breast cancer was initially higher compared to placebo, but this difference in incidence decreased in about 2 years and that the increased risk of breast cancer associated with the use of estrogen plus progestin declined soon after discontinuation of combined hormone therapy. Tranah et al [37] reported that the vascular side-effects of HRT may exceed its beneficial effects on sleep in women with a mean age of 83.8±3.4. Beral et al [38] reported that HRT with eoither CH or CEE increases the risk of ovarian cancer. Nordenvall et al [39] stated that use of HRT may increase the risk of cholecystectomy. HR of cholecystectomy was 1.52 (95% CI, 1.33–1.74) among ever users of HRT compared with never users. The risk did not differ by current or past use (P = 0.38) or duration of use (P = 0.65), but it did differ by indication for use (P = 0.006). Women who used HRT for systemic symptoms had a higher risk of cholecystectomy than those who used it for localized symptoms (HR, 1.62; 95% CI, 1.41–1.87 vs. HR, 1.21; 95% CI, 0.97–1.50). Farhat et al [40] reported that women with a mean age of 64.3 (6.8) taking a lower dose of CH for a duration of 5.6 years were at greater risk of breast cancer. Engel et al [41] reported that giving HRT for a short duration, whatever the progesterone or route of administration, might reduce the risk of fracture over the medium or long term in women with a mean age of 53.8 years. Cravioto et al [42] reported an increased risk of venous thrombosis in women with a mean age of 47.4 (7.4) taking CH. Vickers et al [27] reported that in women with a mean age of 62.8, taking CEE and OP resulted in increased risks of breast and endometrial cancer.

Cirillo et al [43] reported that estrogen therapy increased the risk of biliary tract disease among postmenopausal women. Women with a history of hysterectomy were randomized to 0.625mg/d of CEE or placebo. Women without hysterectomy were randomized to estrogen plus progestin (E+P), given as CEE plus 2.5mg/d of medroxyprogesterone acetate (MPA). Both trials showed a greater risk of any gallbladder disease or surgery with estrogen (CEE: HR, 1.67; 95% CI, 1.35-2.06; E+P: HR, 1.59; 95% CI, 1.28-1.97). Shumaker et al [44] reported that an increased risk for dementia and no effect on mild cognitive impairment (MCI) in women treated with CEE plus MPA. In the estrogen-alone trial, subjects received 1 daily tablet containing either 0.625 mg/d of CEE vs. matching placebo. In the estrogen plus progestin trial, subject received 1 daily tablet containing CEE (0.625 mg/d) plus MPA (2.5 mg/d) vs. matching placebos. HR for probable dementia was 1.76 (95% CI, 1.19-2.60; P=.005) and for MCI, HR was 1.77 (95% CI, 0.74-4.23; P=.20) in the estrogen-alone trial and 2.19 (95% CI, 1.25-3.84; P=.006) in the pooled trials. Rossouw et al [30] reported that the overall health risks exceed benefits from the use of combined estrogen plus progestin and this regimen should not be initiated or continued for the prevention of chronic heart disease (CHD). Nelson et al [45] reported that the prolonged use of estrogen in postmenopausal women with a mean age of 69.3 in current users, 70.9 in past users and 70.7 in continuous users, provided incomplete protection against osteoporotic fractures. Women with osteoporosis who are at a high risk for fractures.

Conclusions

The benefits of HRT are based on the duration of therapy, the age of initiating therapy, route of administration, and type of therapy (mono/dual). Initiating HRT in post-menopausal women will not yield maximum number of beneficial outcomes, unless the above factors are taken into consideration and therapy planned the accordingly.

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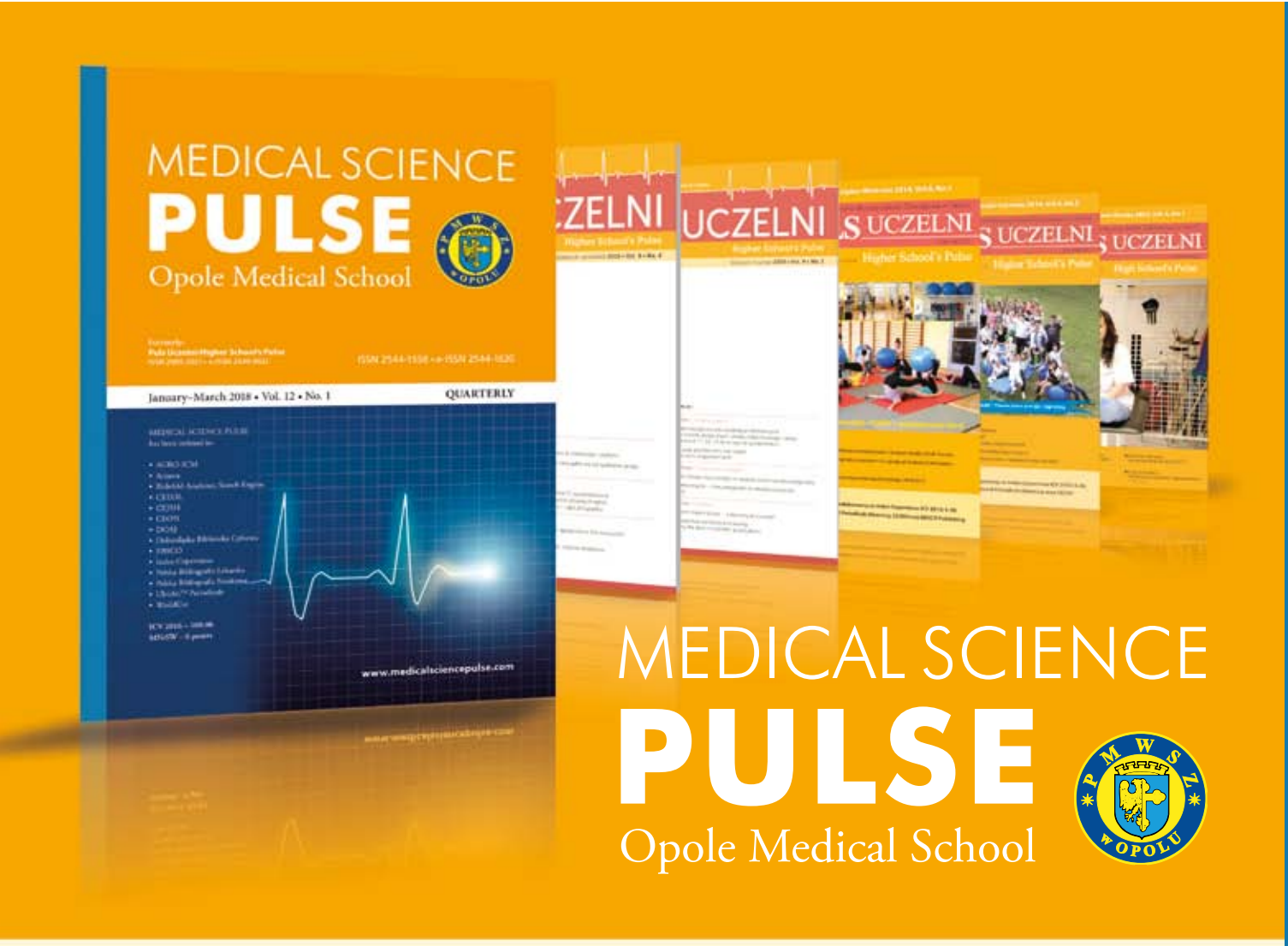

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