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Clinical characteristics and in-hospital outcomes in hospitalized patients above 80 years of age — a pilot study

Hospitalizowani chorzy po 80. roku życia — charakterystyka kliniczna i rokowanie wewnątrzszpitalne; badanie pilotażowe*

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Anna Michalska jest studentką kierunku lekarskiego na Wydziale Lekarskim i Nauk o Zdrowiu Uniwersytetu Jana Kochanowskiego w Kielcach. W 2017 roku założyła pierwsze koło naukowe kierunku lekarskiego — SKN Eskulap. Obecnie pełni w nim funkcję wiceprezesa. Jej zainteresowania naukowe obejmują schorzenia ośrodkowego układu nerwowego wynikające z chorób układu sercowo-naczyniowego oraz choroby autoimmunologiczne. W wolnym czasie trenuje biegi długodystansowe i wspinaczkę wysokogórską.

Abstract

Introduction. The elderly above 75 years of age are characterized by lower body capabilities, a significant decrease in adaptability, and susceptibility to geriatric diseases, which strongly correlate with management problems in these age groups. The aim of the study was to assess the population of hospitalized patients above 80 years of age. Demographic data, comorbidities and in-hospital outcomes in the studied population were evaluated.

Material and methods. A retrospective study included 8100 patients hospitalized at the Department of Cardiology in 2013–2015. Overall, 982 patients (including 561 women) were evaluated. The mean age of the study group was 86 years (± 3.7 years). In the study group, 884 patients (90%) were aged 80–89, 97 patients (9.9%) were aged 90–99, and one person (0.1%) was older than 99 years.

Praca powstała w ramach realizacji projektu: „Zakup wyposażenia I Klinicznego Oddziału Kardiologii i Pracowni Elektrofizjologii szansą na zwiększenie innowacyjności Wojewódzkiego Szpitala Zespolonego w Kielcach" współfinansowanego przez Unię Europejską ze środków Europejskiego Funduszu Rozwoju Regionalnego w ramach Regionalnego Programu Operacyjnego Województwa Świętokrzyskiego na lata 2007–2013

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Results. Ischaemic heart disease was present in 606 patients (61.7%), heart failure in 600 patients (60%), and atrial fibrillation in 452 patients (46%). Heart failure was the most common reason for hospitalization, identified in 340 subjects (34.6%), or one in three subjects, followed by a cardiac pacemaker implantation in 162 subjects (16.5%). Overall, a pacemaker or cardioverter-defibrillator was implanted in 473 subjects (48.2%) among those above 80 years of age. The most common causes of in-hospital mortality were heart failure in 29 patients (56.9%) and an acute coronary syndrome in 17 patients (33.3%).

Conclusions. Heart failure is the most common cause of hospitalization in patients above 80 years of age, and ischaemic heart disease is the most common comorbidity in this age group. In the study population, cardiovascular decompensation was the main cause of mortality.

Key words: middle-old, oldest-old, comorbidities, in-hospital outcomes

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Introduction

In the recent years, an increase in the mean length of life has been observed due to civilizational and scientific progress. This evident prolongation of the average length of life in the general population may be attributed to advances in medical technologies and treatment methods, but also to an increasing adoption of the healthy lifestyle [1, 2]. In 2016, the population of Poland was 38,432,990, including 1,611,840 persons above 80 years of age, amounting to 4.2% of the population [3]. Women predominate in this age group. In the recent decades, a rapid increase in the number of octogenarians has been seen in many countries and this trend is predicted to continue in the coming years. However, it is the number of centenarians that has shown the most spectacular growth, also in our country. According to the Central Statistical Office (GUS) data, the number of centenarians in Poland was 1390 in 2007, increasing to 3196 in 2013 and 4933 in 2016, and the predicted number will exceed 9000 in 2035 [4, 5]. Both old age (75–90 years) and very old age (> 90 years) are significant risk factors for many cardiovascular diseases, malignancies, neurological conditions, musculoskeletal problems and many other conditions. Comorbidities often worsen the clinical course of other diseases to a greater extent than in younger subjects. Also drug treatment in subjects above 80 years of age is significantly more problematic due to altered drug pharmacodynamics and pharmacokinetics compared to younger patients.

The aim of the study was to assess the population of hospitalized patients above 80 years of age. Demographic data, comorbidities and in-hospital outcomes in the studied population were evaluated.

Material and methods

We retrospectively studied 8,100 patients hospitalized in our department of cardiology in 2013–2015. The analysis included 982 subsequent hospitalized patients aged 80 or above. We analysed demographic data, comorbidities, causes of admission, and in-hospital mortality.

Results

Of 8,100 patients hospitalized in 2013–2015, 982 patients (12.1%) were at least 80 years of age. Of these, 291 patients (29.6%) were admitted in 2013, 228 patients (23.2%) were admitted in 2014, and 463 patients (47.1%) were admitted in 2015.

The study group included 561 women (57.1%). Overall, 645 patients (65.7%) were residents of urban areas, and 337 patients (34.3%) were residents of rural areas.

The mean age was 84.6 years (SD ± 3.7 years) overall, 84.8 years (SD ± 3.8 years) in women, and 84.3 years (SD ± 3.6 years) in men. In the study group, 884 patients (90%) were aged 80–89, 97 patients (9.9%) were aged 90–99, and one person (0.1%) was above 99 years of age. The proportion of women and men in these age groups is shown in Figure 1.

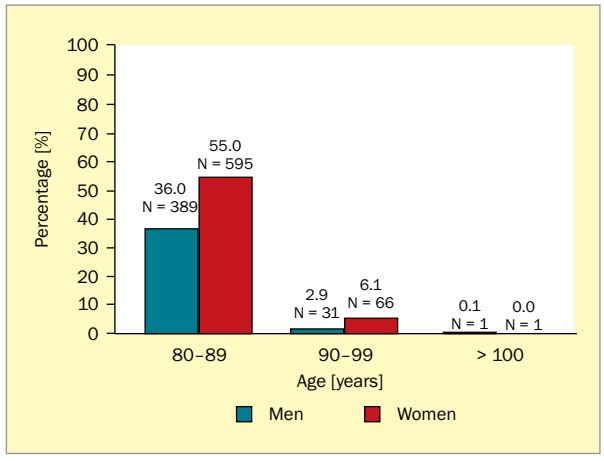

Figure 1. Proportion of women and men in various age groups

Table 1. Concomitant conditions in the study group

Clinical data	Number of patients [%] N = 982
Concomitant conditions	
Ischaemic heart disease	606 (61.7%)
Heart failure	590 (60%)
Atrial fibrillation	452 (46%)
Hypertension	386 (39.3%)
Osteoarthritis	178 (38.4%)
Chronic kidney disease	372 (37.9%)
Previous myocardial infarction	364 (37.1%)
Hypercholesterolemia	317 (32.3%)
Diabetes type 2	283 (28.8%)
Thyroid disease	155 (15.8%)
Previous stroke	116 (11.8%)
Chronic obstructive pulmonary disease	82 (8.4%)
Malignancy	75 (7.6%)
Parkinson disease	5 (1.1%)
Depression	8 (0.8%)
Alzheimer disease	3 (0.6%)
Osteoporosis	3 (0.6%)
Cardiac interventions	
Implanted pacemaker	301 (30.7%)
Previous PCI	226 (23%)
Implanted ICD	172 (17.5%)
Previous CABG	158 (16.1%)
Addictions	
Smoking	14 (1,4%)
Alcohol abuse	1 (0,1%)

PCI — percutaneous coronary intervention; ICD — implantable cardioverter-defibrillator; CABG — coronary artery bypass grafting

Concomitant conditions, previous cardiac interventions, and the proportion of smoking and alcohol abuse in patients above 80 years of age are shown in Table 1. The most common conditions were cardiovascular, with ischaemic heart disease present in 606 patients (61.7%), heart failure in 600 patients (60%), and atrial fibrillation in 452 patients (46%). Of note hypertension was present in only 386 patients (39.6%), and dyslipidaemia in 317 patients (32.3%). A pacemaker or cardioverter-defibrillator was implanted in 473 patients (48.2%) above 80 years of age.

Ischaemic heart disease was diagnosed in 331 women (54.6%) and 275 men (45.4%). The second most common cardiac condition in the study group was heart failure. Most patients were in New York Heart Association (NYHA) class II (233 patients, 39.5%), followed by 131 patients (13.3%) in NYHA class III and only 23 patients (2.3%) in NYHA class IV. Atrial fibrillation, the third most common condition in the study group, was present in 260 women (57.7%) and 192 men (42.5%).

Table 2 shows reasons for admission among patients aged 80 or above. Our retrospective analysis showed that the most common reason for admission was heart failure (340 patients, 34.6%), followed by implantation or reimplantation of a pacemaker, cardioverter-defibrillator or cardiac resynchronization therapy device (307 patients, 31.3%). The third most common reason for admission was an acute coronary syndrome (224 patients, 22.8%).

Most patients (N = 615, 62.6%) were hospitalized for up to 7 days. One in three patients was hospitalized for 8–14 days, 43 patients (4.4%) were hospitalized for 2–3 weeks. Only 8 patients (0.8%) were hospitalized for 22–27 days (Figure 2).

Among 982 hospitalized patients aged 80 or above, 51 patients (5.2%) died, including 17 men (33.3%) and 34 women (66.47%). The most common causes of death were heart failure in 29 patients (56.9%) and acute coronary syndrome in 17 patients (33.3%).

Table 2. Reasons for admission in the study group

Reason for admission	Number of patients N = 982	Proportion [%]
Heart failure	340	34.6
Implantation/reimplantation of a pacemaker, cardioverter-defibrillator or cardiac resynchronization therapy device	307	31.3
Acute coronary syndrome	224	22.8
Stable angina	52	5.3
Elective coronary angiography/percutaneous coronary intervention	25	2.5
Elective electrical cardioversion	10	1
Pulmonary embolism	17	1.7
Hypertensive crisis	4	0.4
Other	3	0.3

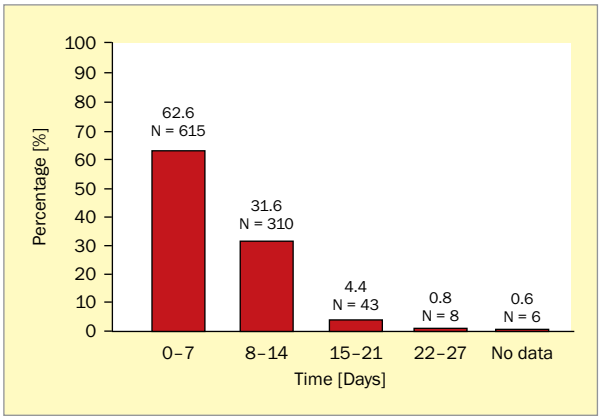

Figure 2. Length of hospital stay in the study group

Of those who died, 29 patients (56.9%) were 85–89 years of age, 12 (23.5%) were 80–84 years of age, 6 (11.8%) were 90–94 years of age, and only 4 (7.8%) were 95 years of age or above.

Discussion

In the present study, we evaluated nearly one thousand of patients aged 80 or above who were hospitalized in a cardiology unit. The proportion of elderly subjects has increased in the recent years, which is also notable among hospitalized patients. In our tertiary care cardiology unit, the proportion of patients above 79 years of age hospitalized in 2013–2015 increased significantly. Compared to younger subjects, elderly patients are less frequently included into randomized clinical trials, and thus few reports are available regarding this patient group.

In the reported study, women comprised the majority of patients above 79 years of age. This is consistent with an increasing length of life that has been observed for years among women. The latter is related, among others, to higher mortality among men, evident for nearly all mortality cause categories, also in the elderly. This is confirmed by literature data showing a large difference in the average length of life between men and women in Poland, much higher compared to the most developed Western European countries. For this reason, women predominate among the elderly and this gender disproportion increases with age [5, 6].

In our study, most patients were at the age of 80–89 years, and one in ten was above 89 years of age. The proportion of nonagenarians in our study seems high. Musculoskeletal problems, mental problems, hearing loss and eye problems are predominant conditions in this age group but cardiac conditions are frequent reasons for admission. In a study that included 80 patients admitted to a general internal medicine unit, Kaczor et al. [3] showed that cardiovascular conditions were the reason for admission in 50% of cases, followed by pneumonia in 31% of cases, while dehydration and water-electrolyte imbalances were contributing factors and/or reasons for admission in as many as 30% of patients. Among cardiovascular conditions, heart failure was twice more common reason for hospitalization compared to acute coronary syndrome and cardiac arrhythmia. Of note, seniors admitted to cardiology units are selected patients in whom the cardiac condition was the reason for admission, and thus may not present with all the conditions that are typical for this age group. In our study, cardiovascular decompensation was the reason for admission to a cardiology unit in most patients. The prevalence of heart failure increases with age. It has been estimated that the prevalence of heart doubles with each decade of life beyond 59 years of age [7]. The TEMISTOCLE study showed that heart failure was the most common cause of admissions and readmission in the elderly [8].

In contrast to middle-aged subjects in whom heart failure with impaired left ventricular systolic function predominates, the elderly subjects often present with signs and symptoms of heart failure despite preserved left ventricular systolic function [9]. Heart failure with preserved left ventricular systolic function is seen in 40–80% of the elderly subjects, nearly twice more commonly among women [10]. In the Cardiovascular Heart Study in subjects above 65 years of age, heart failure with preserved left ventricular systolic function was diagnosed in as many as 55% of cases [11]. In our study, heart failure was the most common cause of admissions and mortality among subjects aged 80 and above.

In our study population, ischaemic heart disease was present in nearly 62% of subjects, with a history of myocardial infarction in more than half of them. A significant proportion of subjects underwent a previous percutaneous or surgical myocardial revascularization. We did not determine patient age at the time of coronary revascularization, and age is not a contraindication for coronary revascularization. In a study that included 191 patients aged 80 or above with non-ST segment elevation myocardial infarction, Gierlotka et al. [12] showed that invasive strategy and guideline-recommended modern drug therapy reduced long-term mortality in these very elderly patients with non-ST segment elevation myocardial infarction despite an observed increase in the bleeding rate.

Atrial fibrillation was present in 46% of subjects in our study. The prevalence of cardiac arrhythmia increases sharply with age. In the Rotterdam Study, the prevalence of atrial fibrillation was nearly 20% [13]. In a Polish population of hospitalized nonagenarians, atrial fibrillation was identified in 42% of subjects [3]. Thus, the clinical characteristics of the hospitalized population differ from

those in the general population. Of note, we found a relatively low proportion of patients with hypertension (40%) in our study group. Based on the Framingham study, the prevalence of hypertension in the general population below 60 years of age was below 30%, increasing to 59% at later age, and exceeding 70% in those above 80 years of age [14]. In the study by Lubszczyk et al. [15] that included patients above 65 years of age presenting to an emergency department, hypertension was present in only about 10% of subjects. In our study, one third of patients was admitted to a cardiology unit for implantation or reimplantation of a cardiac pacemaker, cardioverter-defibrillator or cardiac resynchronization therapy device. Thus, hypertension might indeed have been absent in a significant proportion of these patients.

In summary, octogenarians and nonagenarians admitted to a cardiology unit are a special subset that differs not only from younger hospitalized subjects but also from the elderly subjects seen on an outpatient basis or admitted to non-cardiac units.

Conclusions

1. In our study, hospitalized patients above 80 years of age were mostly women who were residents of urban areas. 2. The most common conditions in hospitalized subjects above 80 years of age included ischaemic heart disease, heart failure, and atrial fibrillation. 3. The most common reasons for admission in subjects above 80 years of age were heart failure, implantation/reimplantation of cardiac electrotherapy device, or an acute coronary syndrome. The length of hospital stay was usually up to 7 days. 4. The proportion of in-hospital deaths among patients above 80 years of age was small. Most deaths were noted in those aged 85–89, and cardiovascular decompensation was the most common cause of death.

Conflict of interest(s)

BWk has received fee for lectures: Egis, Krka, MSD, Mylan, Servier.

Streszczenie

Wstęp. Wiek starczy (75–90 lat) i wiek sędziwy (> 90 lat) cechuje mniejsza wydajność organizmu, istotny spadek zdolności adaptacyjnych i podatność na choroby geriatryczne, co silnie koreluje z utrudnioną terapią w tych grupach wiekowych. Celem pracy była ocena populacji hospitalizowanych chorych powyżej 80. roku życia. Oceniono dane demograficzne, schorzenia współistniejące oraz rokowanie wewnątrzszpitalne badanej populacji.

Materiały i metody. Retrospektywnym badaniem objęto 8100 chorych hospitalizowanych w klinice kardiologii w latach 2013–2015. Ocenie poddano 982 chorych (561 kobiet), a średni wiek badanej grupy wynosił 86 lat (± 3,7 roku). W badanej grupie 884 osób (90%) miało 80–89 lat, 97 osób (9,9%) — 90–99 lat, a 1 osoba (0,1%) przekroczyła 99. rok życia.

Wyniki. Choroba niedokrwienna serca występowała u 606 chorych (61,7%), niewydolność serca — u 600 chorych (60%), a migotanie przedsionków — u 452 chorych (46%). Najczęstszym powodem przyjęcia do szpitala była niewydolność serca, która — dotyczyła co 3. pacjenta (340 osób; 34,6%). Drugą z kolei przyczyną hospitalizacji było wszczepienie stymulatora serca (162 osoby; 16,5%). W badanej grupie chorych powyżej 80. roku życia 473 osobom (48,2%) implantowano stymulator lub kardiowerter-defibrylator. Najczęstszymi przyczynami zgonu wewnątrzszpitalnego były niewydolność serca u 29 chorych (56,9%) oraz ostry zespół wieńcowy u 17 chorych (33,3%).

Wnioski. Niewydolność serca to najczęstsza przyczyna hospitalizacji chorych powyżej 80. roku życia, natomiast choroba niedokrwienna serca to najczęstsza współtowarzysząca jednostka chorobowa w tej grupie. W analizowanej populacji główną przyczyną zgonów była dekompensacja układu sercowo-naczyniowego.

Słowa kluczowe: wiek starczy, wiek sędziwy, schorzenia współistniejące, rokowanie wewnątrzszpitalne

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