

Comorbidities in patients over 60 years of age treated at the rehabilitation clinic

*Magdalena Pietrzyńska¹, Barbara Stawińska-Witoszyńska¹,
Alicja Krzyżaniak¹, Magdalena Łańczak-Trzaskowska², Kamila Nowak³*

¹ Department of Epidemiology of the Faculty of Social Medicine at the University of Medical Sciences of Karol Marcinkowski in Poznań, Poland

² Clinic for Physiotherapy, Rheumatology and Rehabilitation, Wiktor Dega Clinical Orthopaedic and Rehabilitation Hospital, Karol Marcinkowski University of Medicine in Poznań, Poland

³ Extramural Postgraduate Studies in Research Methodology at the University of Medical Sciences of Karol Marcinkowski in Poznań, Poland

ABSTRACT: Patients aged above 60 represent a very diversified population group with respect to their health condition. This may result from multimorbidity. In the rehabilitation process of elderly patients it is especially crucial to identify not only the underlying diseases which constituted the grounds for referral to the rehabilitation clinic, but also the comorbidities that have to be taken into consideration while planning their rehabilitation. The aim of the present paper is the assessment of comorbidities in patients of the rehabilitation clinic. The study population included 1616 patients (447 man and 1169 women) treated at the rehabilitation clinic. The factors put through analysis were the age and gender of the patient, the main diagnosed (underlying) illness subject to rehabilitation treatment, as well as comorbidities. All diseases, both the underlying conditions and the comorbidities have been classified according to the International Statistical Classification of Diseases and Related Health Problems (10th revised edition). The main reasons for the treatment at the rehabilitation outpatient clinic were arthrosis of the spine, knee and hip joints, polyarthrititis, osteoporosis, diseases of the central nervous system diseases and paralytic syndromes as consequences of strokes, hypertension or atherosclerosis, as well as post-traumatic conditions.

The most frequent comorbidities occurring in patients of the rehabilitation clinic were cardiovascular diseases (irrespective of the age group and the underlying disease). In the age group of 60–64, the subsequent comorbidities were gastrointestinal and cancers, and in the age of 65–74, neoplasms were the most frequently occurring comorbidities. The performed analysis resulted in the following conclusions: The majority of patients diagnosed and treated at the rehabilitation centre suffered from irregularities in the muscular, articular and skeletal system or the connective tissue (those were mainly the arthrosis of the spine, hip and knee joints as well as osteoporosis). The most frequently observed comorbidities in patients of the rehabilitation clinic were cardiovascular and gastrointestinal diseases, as well as neoplasms.

KEY WORDS: multimorbidity, rehabilitation, geriatrics

Introduction

Taking up the subject of morbidities among elderly patients has been dictated by demographic changes taking place both in Poland and all over the world, which consist in the increasing number of the elders and their growing participation in the overall population (Bień 2014). In the year 2060 the forecasted percentage of people over the age of 60 in Europe shall reach 30%, whereas in Poland 36%, which provides evidence that the aging process is faster for the population of our country (Staszewska 2013). It is one of the highest projected percentages constituted by the elderly population group within the present European Union countries (Wojtyniak et al. 2012).

In the period of 2004–2009 the percentage of people over the age of 60 increased by 2 percentage points for Poland as a whole, and more than 4 percentage points for Poznań itself. (www.stat.gov.pl-demografia 2015). The percentage of people over 60 years of age living in Poznań is even higher than that reported

for Poland and the Province of Wielkopolska, which is of ultimate importance when planning the medical care (Figure 1) (www.stat.gov.pl-demografia 2015).

The demographic changes are accompanied by technological, civilizational as well as socio-cultural transformations, which are not easy to cope with by the elderly. Elderly people represent a very diversified population group with respect to their health condition. This may result from multimorbidity typical for that age group. Multimorbidity (or multiple-morbidity) is *defined* as the co-occurrence of two or more (usually chronic) diseases in the same person, without indication as to the underlying disease (Duda 2012, Wieczorowska-Tobis 2011).

At the rehabilitation clinic, besides the underlying disease due to which the patient is subject to rehabilitation, one should bear in mind other co-occurring illnesses which may affect the efficacy of the therapy. The phenomenon of co-occurrence of other chronic diseases besides the underlying disease (which requires rehabilitation and treatment) is

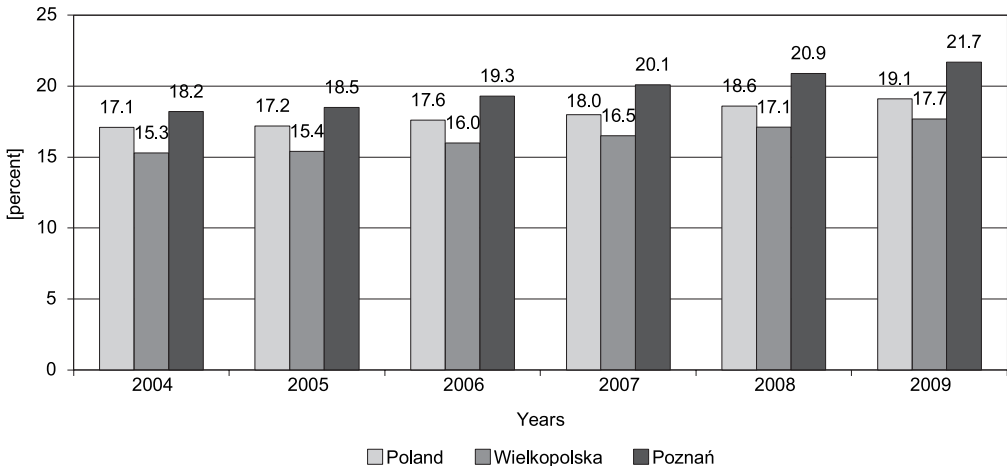


Fig. 1. The percentage of the population over 60 years of age in Poland, the Province of Wielkopolska and the city of Poznań in the period of 2004–2009

Source: www.stat.gov.pl, Accessed on May 13, 2015.

called comorbidity or coexistence of two or more diseases, the two terms being used interchangeably in related publications (Duda 2012).

Aim of the study

The aim of the present paper is the assessment of comorbidities in patients treated at the rehabilitation clinic.

Materials and Methods

The study population included 1616 patients subject to the rehabilitation treatment in the period of 2004–2009. The size of the study population as divided according to the age and gender is presented in Table 1.

The inclusion criteria were: age over 60, place of permanent residence being the city of Poznań and rehabilitation treatment performed within the national healthcare system. Every third patient file was (randomly) selected (available for access without the identification of personal data). The factors put through analysis were gender and age of the patient, the main diagnosed (underlying)

illness subject to rehabilitation treatment, as well as the diseases which were reported by doctors in medical documentation as comorbidities.

All diseases, both the underlying conditions and the comorbidities have been classified according to the International Statistical Classification of Diseases and Related Health Problems (10th revised edition).

The results of the study were subject to statistical analysis performed by means of IBM SPSS Statistics 22 software. The significance level applied to statistical inference was $\alpha=0.05$.

While comparing the two groups the t-Student test, as well as the nonparametric Mann-Whitney test in case of a significant discrepancy in the size of groups were used. With respect to the nominal and ordinal level of data Pearson's chi-square test was applied in order to determine the significance of differences between groups.

Results

The study population included 1169 women and 447 men, who constitut-

Table 1. The studied population according to age and gender

Age group	Males		Females		Total	% of the total number of studied patients
	N	% of 447	N	% of 1169		
60–64	127	28.4	202	17.3	329	20.4
65–69	105	23.5	289	24.7	394	24.4
70–74	99	22.1	327	28.0	426	26.4
75–79	63	14.1	185	15.8	248	15.3
80–84	37	8.3	112	9.6	149	9.2
85–89	12	2.7	44	3.8	56	3.5
Over 90	4	0.9	10	0.8	14	0.8

N – number of patients in specific age groups.

Table 2. The average age of patients reporting to the rehabilitation clinic in the period of 2004–2009

Year of admittance	Average age	SD
2004	70.5	5.5
2005	72.0	6.8
2006	72.0	7.5
2007	71.8	7.5
2008	71.4	7.5
2009	67.6	7.8
Total	71.0	7.2

SD – standard deviation.

ed 53% of the overall number of people treated in the rehabilitation clinic in the period of 2004–2009.

The majority of referrals (85%) to the rehabilitation clinic came from general physicians, 12% of the patients were referred for rehabilitation by specialists and only 3% were sent to rehabilitation

after hospital treatment. In 2004 the average age of the patients of rehabilitation clinic was 70.5 years, whereas in 2009, it was 67.6, indicating a statistically significant difference ($p < 0.001$) (Table 2).

The main reasons for undertaking the treatment at the rehabilitation outpatient clinic were arthrosis of the spine, osteoporosis, degenerations of knee and hip joints, polyarthritis, diseases of the central nervous system diseases and paralytic syndromes as consequences of strokes, hypertension or atherosclerosis, as well as post-traumatic conditions (Table 3).

The incidence of the main groups of illnesses in patients belonging to particular age categories is presented in Table 4.

The traumas and illnesses of muscular, skeletal and articular systems and connective tissue, being the main injuries subject to rehabilitation at the outpatient clinic, were mostly observed in the 70–74 age group. Central nervous

Table 3. Main diseases diagnosed at the rehabilitation clinic according to gender

Diseases diagnosed according to ICD10	Gender			Total (%) of the total number of patients included in the study
	Males	Females	N	
Arthrosis of the spine and other dorsopathies (M47 and M51)	286	858	1144	70.8
Osteoporosis (M81 / M80)	35	346	381	23.6
Arthrosis of knee joints (M17)	80	259	339	21.0
Arthrosis of hip joints (M16)	65	206	271	16.8
Polyarthritis (M15)	55	189	244	15.1
Central nervous system diseases and paralytic syndromes (G81, G82)	72	55	127	7.9
Post-traumatic condition of lower / upper limbs (T93/T92)	38	139	177	11.0

() Diseases diagnosed according to ICD-10; N – number of diseases according to gender.

Table 4. Incidence of underlying diseases among patients subject to treatment at rehabilitation clinic according to age groups

Age	Traumas (T90-T98)		Diseases of muscular, skeletal and articular system, and connective tissue (M00-M99)		Osteoporosis (M80,M81)		Central nervous system diseases (G00-G99)	
	N	(%)	N	(%)	N	(%)	N	(%)
60-64	59	20.2	293	20.8	43	11.3	44	23.5
65-69	66	22.6	354	25.1	100	26.2	39	20.9
70-74	78	26.7	378	26.8	102	26.8	38	20.3
75-79	47	16.1	210	14.9	70	18.4	36	19.3
80-84	29	9.9	121	8.5	46	12.1	20	10.7
85 and older	13	4.5	56	3.9	20	5.2	10	5.3
Total	292	100	1412	100	381	100	187	100

N – number of patients; (T90-T93), (M00-M99), (M80,M81),G00-G99) – diagnosed diseases according to ICD-10.

Table 5. Detailed incidence of selected comorbidities according to age of the patients of rehabilitation clinic

Age	Cardio-vascular diseases	Gastro-intestinal diseases	Diabetes	Genito-urinary diseases	Neo-plasms	Res-piratory diseases	Thyroid diseases	Obesity and over-weight	Total for age group
	n=467	n=108	n=91	n=80	n=101	n=47	n=48	n=75	
60-64	92	26	20	22	24	14	16	21	329
	28.0%	7.9%	6.1%	6.7%	7.3%	4.3%	4.9%	6.4%	100%
65-69	86	24	22	16	26	12	12	20	394
	21.8%	6.1%	5.6%	4.1%	6.6%	3.0%	3.0%	5.1%	100%
70-74	116	23	25	15	32	9	14	15	426
	27.2%	5.4%	5.9%	3.5%	7.5%	2.1%	3.3%	3.5%	100%
75-79	83	16	17	10	12	7	6	13	248
	33.5%	6.5%	6.9%	4.0%	4.8%	2.8%	2.4%	5.2%	100%
80-84	62	16	4	16	6	4	0	6	149
	41.6%	10.7%	2.7%	10.7%	4.0%	2.7%	0.0%	4.0%	100%
85 and older	28	3	3	1	1	1	0	0	70
	40.0%	4.3%	4.3%	1.4%	1.4%	1.4%	0.0%	0.0%	100%

% of the group of people in a given age category.

Table 6. Incidence and mean age of cardiovascular and neoplastic disease among patients of the rehabilitation clinic according to gender

Disease	Males N=447		Females N=1169		p
	n (%)	Mean (SD)	n (%)	Mean (SD)	
Cardiovascular diseases	164 (36.7)	70.5 (6.9) years	303 (25.9)	72.1 (7.8) years	^a <0.000 ^b <0.000
Neoplasms	23 (5.1)	71.1 (7.3) years	78 (6.7)	69.4 (6.1) years	<i>p</i> =0.257 <i>p</i> =0.046

n – number of patients, – arithmetic mean, SD – standard deviation, ^aChi-square test, ^bU – Mann-Whitney's test, *p* – value of statistical significance.

system diseases and paralytic syndromes and consequences of vascular (cerebrovascular) diseases were more frequent among younger patients, aged 60–64 (Table 4).

The incidence of comorbidities in patients from the groups subject to analysis is presented in Table 5.

The most frequent comorbidities are cardiovascular diseases (irrespective of the age group and the underlying disease). In the age group of 60–64, the subsequent comorbidities were gastrointestinal and cancers, and in the age of 65–74 most frequently occurring comorbidities were neoplasms.

The incidence of cardiovascular diseases was significantly higher in men (36.7%) than in women (25.9%, *p*<0.000). The average age of the patients with cardiovascular diseases as their comorbidities equalled 72.1 years, and for the patients without cardiovascular diseases – 70.5 years, that difference being significant statistically. Malignant neoplasms were observed as comorbidities in 6.7% women and 5.1% men, but this difference was not statistically significant (*p*=0.257). The average age of the patients with cancers equalled 69.4 years, and for the patients without any neoplasms 71.1 years, which proved to be significantly different (*p*=0.046) (Table 6).

Discussion

The assessment of health condition of an elderly patient is extremely difficult in view of multimorbidity and comorbidity (besides the underlying disease which constitutes the basis for treatment at the rehabilitation outpatient clinic (Grodzicki et al. 2012, Kostka 2009, Wieczorowska-Tobis 2011, Zdrojewski et al. 2013).

The incidence of comorbidities in patients treated in the rehabilitation outpatient clinic approximates the incidence of these illnesses among the population of the province of Wielkopolska (Czyżewska-Torba et al. 2013, Tykarski et al. 2005). Cardiovascular diseases and neoplasms, making up the main causes of deaths among the population of Poland, should be always incorporated in the healthcare treatment plan for the elderly patients (Buchwald-Rogalka 2008, Dyzmann-Sroka et al. 2014, Tykarski et al. 2005).

In the process of aging, the organ lesions occur at different times (aging heterochrony), with various intensity and in various organs (aging heterotopy) (Bień 2014). Multimorbidity (multiple-morbidity, polyopathy), or the comorbidity of several chronic diseases is a typical characteristics of the elderly patients. Multimorbidity means the occurrence

of at least two (usually chronic) disease in a given patient, without indication of the underlying disease. According to Piotrowicz (2013), 50% of elderly people suffer from three or more chronic diseases. Eighty percent of patients aged over 65 years suffer from at least one chronic disease, and in more than half of them the incidence of two or more diseases is observed (Rosenthal et al. 2009).

Planning the rehabilitation for the elderly patients requires the performance of individual assessment of their functional condition and taking into account any contraindications. The age above 65 for many years has been considered a contraindication to physical cardiac rehabilitation. At the moment it is thought that systematic exercise reduces the risk of coronary disease by about 50%. Cardiac rehabilitation should be preceded by a stress test in order to qualify a patient for a particular training group. The selection of the type of rehabilitation treatment in elderly people should be individualized based on their health condition and taking into account the existing contraindications. One of them is cancer and precancerous conditions, during which it is not recommended to apply certain types of physical therapies, such as ultrasounds (Straburzyńska-Lupa and Straburzyński 2003).

The geriatric rehabilitation should always be conducted on multiple levels, taking into account the high incidence of cardiovascular diseases and neoplasms, as well as incorporating the prevention of falls and assessment of functional fitness among the elderly patients.

Conclusions

The performed analysis resulted in the following conclusions:

The majority of patients diagnosed and treated at the rehabilitation centre suffered from irregularities in the muscular, articular and skeletal system or the connective tissue (those were mainly the arthrosis of the spine, hip and knee joints as well as osteoporosis).

The most frequently observed comorbidities which had to be taken into consideration during the treatment at rehabilitation clinic were cardiovascular and gastrointestinal diseases, as well as neoplasms.

Authors' contributions

MP was responsible for the collection of materials, result analysis and drafting the manuscript, BSW performed substantial revision of the paper as well as its translation. Together with MŁK and KN she also carried out the analysis of patient data related to the diagnosed underlying diseases and comorbidities. BSW, MŁK, KN as well as AK gathered related literature, and AK developed research concept.

Conflict of interest

The authors declare that there is no conflict of interest.

Corresponding author

Magdalena Pietrzyńska, Department of Epidemiology of the Faculty of Social Medicine at the University of Medical Sciences of Karol Marcinkowski in Poznań, Dąbrowskiego 79, 60-529 Poznań, Poland
e-mail address: mpietrzy@poczta.onet.pl

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