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Research paper

Analysis of the prevalence of diseases in the rural areas of Warmia and Mazury

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ABSTRACT

Introduction: General practitioners (GPs), are the foreground of all medicine. When a disease starts, most patients have their first contact with medicine in the GP's offices. For this reason, it is likely that the illnesses diagnosed by GPs are consistent with the real number of illnesses occurring in the area of their region.

Aim: To preset in this research we focused on the frequency of cases of disease where there was a problem with receiving prompt medical advice.

Material and methods: We obtained data of 14 279 visits of 2774 patients from January 1 to December 31, 2017, containing an ICD-10 diagnosis, the statistical number of the patient and the patient's age at the time of visit from the 3 GPs facilities belonging to one practice in a rural area near to Olsztyn.

Results and discussion: Analysis has shown that the most popular cardiovascular system disease is essentially hypertension. We found out that hypertension was affecting even the youngest people – males from 20 to 30 years old. Under the age group of 40–50 years old, mainly men suffered from hypertension. The family doctor institution should be the basis of the Polish Health System. It is the place where all the patients' basic needs should be met. This institution should be the first filter of patients, which refers patients to more highly-specialistic medical providers.

Conclusions: The top 15 diagnoses in our study contains prescribing medication, which is the same in Australia. The difference between the two countries is the percentage of this problem – 24.1% in Polish GPs vs. 1.6% in Australian GPs.

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1. INTRODUCTION

General practitioners (GPs) are the foreground of all medicine. When the disease starts, most patients contact the GP's offices, so it is likely that the diagnoses of GPs correspond to the real number of illnesses occurring their region's area. However, not only diagnosis of the disease is important, but also the time of the diagnosis matters. Unfortunately, many patients in Poland are looking for doctor advice, when their disease is already at the advanced stage, leading to more expensive treatment for providers and with smaller chances of full recovery for patients. This problem is particularly important in younger adults, because they are not reconciled with the thought of being ill, so usually they only go to their GP, when the problem is already very significant. Another group of people, who needs prompt diagnosis and treatment are people living in the countryside, because of their limited access to GPs.[1]

2. AIM

The main aim of our study was to examine the medical problems in rural areas of Warmia and Mazury. The collateral aim was to analyze most common problems encountered by GPs in countryside offices, and to compare our result to those from other countries.

3. MATERIAL AND METHODS

For the purpose of our study we obtained records from 14 279 visits of 2774 patients examined in GPs' offices between January 1 to December 31, 2017. The records contained ICD-10 diagnoses, statistical number of patient and patients' age at the time of their visit from three GPs' offices belonging to one health providing company in a rural area nearby Olsztyn. Data were collected, divided in clusters of similar diseases and then analyzed by age and gender. Based on the age at the time of the visit, patients were divided into two groups: above 20 years old and under 20 years old. The above 20 year-old group was further divided into subgroups with range of 10 years. Groups under 20 years old was divided in subgroups with range of 5 years. Analyzing the most common diseases, we divided the diseases into three clusters: cardiovascular system diseases, respiratory system diseases and infectious diseases, then analyzed by the age and gender of patients.

4. RESULTS

Visits-to-age and visit-to-gender analyses showed that in almost every age subgroup (above and below 20 years old) females were more numerous except for subgroup aged 0 to 5 years old. (Tables 1 and 2) Also, our analysis showed a decline in a number of visits with increasing age from 5 to about 25 years old in both genders, followed by a rise in a number of visits as patients got older (Tables 1 and 2). We also analyzed the most common reasons for visits in GP's office. We noticed that the most common reason to see a doctor was to get a prescription refill (Z76.0) ($n = 3443$). The second one was medical observation and evaluation for suspected diseases and condition (Z03) ($n = 1009$). Next cause of visits was acute nasopharyngitis (J00) ($n = 835$), which affected patients in all age groups, but was particularly prevalent in the young and elderly patients (Table 3) Other common causes (above 5% of visits) included: essential (primary) hypertension (I10) ($n = 786$) and persons encountering health services for other counselling and medical advice, not elsewhere classified (Z71) ($n = 733$). Also our data showed that women visited doctors more frequently than men (Tables 1 and 2).

Our analysis demonstrated that infectious diseases were the most common diseases of respiratory system, with the highest frequency of acute nasopharyngitis (J00) ($n = 545$). In the group of patients with acute nasopharyngitis, females (60.73%) were a bit more numerous than males (38.27%), the average age of such patients was 23. Analyzing the peak age for acute nasopharyngitis we found out that it was most commonly represented in the first year of life. Similarly to acute nasopharyngitis were acute pharyngitis (J02) and acute upper respiratory infections of multiple and unspecified sites (J06) (Table 3). Our analysis also showed that acute sinusitis (J01) was characterized by higher mean (33.35 years of age) and peak age for (35) than other disease. In this case the prevalence of women was essential (women 74.07% vs. men 25.93%). We also found, that the most common non-infective respiratory system disease was asthma (J45) ($n = 47$). Our analysis revealed that the average age of patients suffering from asthma was about 35. A slightly higher prevalence of asthma was observed in females (women 59.57% vs. men 40.43%), but it was similar to other cases of infectious diseases.

Table 1. Patients under 20 years old.

Age, y	Total, n	Males, n(%)	Females, n(%)
0–4	1698	1048(61.72)	650(38.28)
5–9	745	331(44.43)	414(55.57)
10–14	469	201(42.86)	268(57.14)
15–19	413	159(38.50)	254(61.50)

Table 2. Patients over 20 years old.

Age, y	Total, n	Males, n(%)	Females, n(%)
20–29	821	342(41.66)	479(58.34)
30–39	1333	517(38.78)	816(61.22)
40–49	1211	484(39.97)	727(60.03)
50–59	2342	950(40.56)	1392(59.44)
60–69	2533	1092(43.11)	1441(56.89)
70–79	1372	610(44.46)	762(55.54)
80–89	809	269(33.25)	540(66.75)
90–99	131	34(25.95)	97(74.05)

Table 3. The frequency and arrangement of respiratory system diseases relative to age and gender of patients.

Diagnosis (ICD-10)	Percent of all patients	Number of patients, n	Age			Sex	
			Average	Median	Dominance of age	Males, %	Females, %
J00	28.59	545	23.23	17	0	39.27	60.73
J06	16.21	309	27.91	21	1	39.16	60.84
J02	9.55	182	21.25	11.5	5	43.96	56.04
J01	7.08	135	33.35	33	35	25.93	74.07
J03	6.14	117	23.52	18	5	48.72	51.28
J20	6.09	116	31.99	30.5	4	43.97	56.03
J11	5.67	108	37.10	35	32	46.30	53.70
J04	4.20	80	20.46	10	5	37.50	62.50
J18	3.99	76	38.37	37.5	1	57.89	42.11
J30	2.89	55	16.07	7	5	38.18	61.82
J45	2.47	47	34.79	37	5	40.43	59.57
J44	2.05	39	70.00	70	80	53.8	46.15
J98	2.05	39	40.97	39	66	46.15	53.85
J22	0.84	16	48.63	54.5	59	31.25	68.75
J35	0.73	14	12.50	6	5	71.43	28.57
J31	0.31	6	44.83	41.5	–	66.67	33.33
J32	0.21	4	46.75	42	–	0	100.00
J34	0.21	4	27.50	18.00	–	50.00	50.00
J40	0.21	4	65.50	64.50	–	50.00	50.00

Table 4. The frequency of all cardiovascular diseases.

Diagnosis		Number of patients, n(%)
ICD-10	Description	
I10	Essential (primary) hypertension	786(28.33)
I11	Hypertensive heart disease	6(0.22)
I21	Acute myocardial infarction	2(0.07)
I24	Other acute ischaemic heart diseases	3(0.11)
I25	Chronic ischaemic heart disease	36(1.30)
I26	Pulmonary embolism	13(0.47)
I34	Nonrheumatic mitral valve disorders	1(0.04)
I40	Acute myocarditis	1(0.04)
I44	Atrioventricular and left bundle-branch block	1(0.04)
I47	Paroxysmal tachycardia	1(0.04)
I48	Atrial fibrillation and flutter	174(6.27)
I49	Other cardiac arrhythmias	16(0.58)
I50	Heart failure	47(1.69)
I69	Sequelae of cerebrovascular disease	13(0.47)
I70	Atherosclerosis	25(0.90)
I77	Other disorders of arteries and arterioles	1(0.04)
I80	Phlebitis and thrombophlebitis	42(1.51)
I83	Varicose veins of lower extremities	9(0.32)
I84	Oesophageal varices	11(0.40)
I87	Other disorders of veins	1(0.04)
I89	Other noninfective disorders of lymphatic vessels and lymph nodes	1(0.04)
Total		1190(42.90)

Table 5. The frequency of hypertension relative to age and gender of patients.

Age	All, n	Males, n(%)	Females, n(%)
20–29	25	22(88.00)	3(12.00)
30–39	59	39(66.10)	20(33.90)
40–49	81	41(50.60)	40(49.40)
50–59	201	83(41.29)	118(58.71)
60–69	214	76(35.51)	138(64.49)
70–79	139	59(42.45)	80(57.55)
80–89	61	21(34.43)	40(65.57)
≥ 90	2	1(50.00)	1(50.00)

The analysis showed that the most common cardiovascular system disease was essential hypertension (I10) ($n = 786$). As presented in the Table 4 we found out that hypertension was affecting even the youngest adults – males from 20 to 30 years of age. In the age group of 40–50 years old, mainly males suffered from hypertension ($n = 102$ vs. $n = 63$). We also discovered, that the prevalence of women in the above 50-years old age group (Table 5). The second most common disease of cardiovascular system in our analysis was the atrial fibrillation and flutter (I48) ($n = 174$). This disease affected mainly elderly people. In the group of 60–70-years-old men were slightly more numerous than women, but in the next group (70–80 years old), the number of men rapidly increased, when the number of women remained the same (Table 6).

Analysis of infectious diseases showed that the most common diseases was acute nasopharyngitis (J00) and

other infectious respiratory system diseases presented earlier (Table 7). From the diseases not applicable to respiratory system, the most common disease of probable bacterial etiology was gastroenteritis and colitis of infectious and unspecified origin (A09) ($n = 14$), which affected people in all age groups, but was particularly prevalent in youngest ones. The second most common was Lyme disease (A69.2) ($n = 7$). Analysis showed that occurring with greatest frequency viral disease that not affected respiratory tract were other their viral infections characterized by skin and mucous membrane lesions, not elsewhere classified (B08) ($n = 40$), which affected mainly young people (5 years of age) and peak age for 1 year of age. The second viral disease was zoster (herpes zoster) (B02) ($n = 18$), which mainly affected the elders. Additionally, we found that in the group of other infectious disease groups the most common one was a parasitic disease known as scabies (B86) and in the group of fungal diseases the most common was dermatophytosis (B35), but these illnesses were so rare that we were not able to perform any reliable analysis on that data.

5. DISCUSSION

GP institution should be the base of Polish Health System. It is the place, where all the patient's basic needs should be met. This institution should be the first filter of the patients, whose conditions require attendance of high-specialist medical providers. This function is not fulfilled by GP's office – family doctor should not be coordinating the therapeutic process, but he/she should have a wide cooperation with other specialists.[2]

Better primary care service is a key to avoid potential hospitalization, but the countries with stronger primary care have higher total health care expenditures. Also better primary care system is associated with fewer potential deaths due to ischemic heart disease, cerebrovascular disease, asthma and bronchitis.[3] In order to provide appropriate care of patients, a well-trained GP should have knowledge of patient's and his/her family history.[4] This kind of bond is unique to this speciality.[4] It is probably not possible to provide it to every patient having 3000 of patients in 3 offices.

We figured out that in almost all age groups there was a slightly higher occurrence of women's visits compared to men's. It could be justified by longer life expectancy of females in Poland.[5] Also it could be justified by the fact, that females are more willing to visit GP's office and pay more attention to their health.[6] Only one age subgroup of patients, which was dominated by males, was from birth to 5 years of age, what could be caused by prevalence of male births than females, especially in rural areas.[7]

Our research also showed that for both genders, number of visits declined with increasing age from age 0 up to 25 years old and increasing visits-to-age dependence further this point. Such finding is typical, but it could also be dangerous for young people, who ignore first disease symptoms, leading to shortening life expectancy and increasing costs of treatment.

Table 6. The dependence between the number of atrial fibrillation and the age and gender of patients.

Age	Total, n	Males, n(%)	Females, n(%)
<50	1	1(100.00)	0(0)
50–59	3	2(66.67)	1(33.33)
60–69	59	33(55.93)	26(44.07)
70–79	67	41(61.19)	26(38.81)
80–89	38	9(23.68)	29(76.32)
90–99	6	4(66.67)	2(33.33)

Table 7. The frequency and arrangement of bacterial infectious diseases.

Diagnosis (ICD-10)	Recognition	Number of cases, n(%)
J00	Acute nasopharyngitis (common cold)	545(19.65)
J06	Acute upper respiratory infections of multiple and unspecified sites	309(11.14)
J02	Acute pharyngitis	182(6.56)
J01	Acute sinusitis	135(4.87)
J20	Acute bronchitis	116(4.18)
J11	Influenza, virus not identified	108(3.89)
J04	Acute laryngitis and tracheitis	80(2.88)
J18	Pneumonia, organism unspecified	76(2.74)

The most common reason of seeking GP's advice was to prescribe medication. In the light of limited accessibility of provided services with long queues for a visit, especially in bigger facilities, this is the limiting factor.[1] The reason for this is the fact that doctors in studied facilities prescribed drugs for a maximum period of 120 days during one visit. Prescribing long-term-use drugs for 12-months period during one visit is factor that could improve accessibility, and it is legally possible.[8] Also as it is now, in Poland only doctors are allowed to prescribe drugs, but in other health care systems also trained nurses are able to refill prescriptions improving the care patients receive.[1]

Analysis of visits showed that 147 most common diagnoses cover 90% of cases. It is consistent with data obtained by Cook et al., which showed that in primary care doctor should know 168 problems to cover 78% of consultations.[9]

Obtained data showed, that the cardiovascular diseases were highly represented. In 2014 they caused over 10% of male and females deaths in Poland. But overall in Europe, cardiovascular diseases were the most common diseases, in 2016 were responsible for almost 45% of all deaths.[10] In the United States in 2010 only hearth diseases were responsible for more than 24% of all deaths.[11] So, it is a significant problem in primary health care, which should take basic care of all patients. In our studies we found out that the most common cardiovascular disease was the primary hypertension. It is the most common kind of hypertension with unclear etiology. In Table 5 we can see that it affects not only middle-aged people, but also young adults – 20–30 year old

males. Up to the age of 40–50, patients with hypertension are mostly males. It could be justified by the protecting role of premenopausal hormones. Over 40–50 years of age, during menopause, hormonal activity stops, which is visible in trends as increasing female-to-male ratio.

The morbidity of cardiovascular diseases in Poland is significantly higher than European average and average for European Union. In countries that had a highest expenditure for healthcare per capita – Luxembourg, Norway, Netherlands the morbidity and mortality for cardiovascular diseases's is significantly lower than in Poland.[10,12]

We found out that the respiratory system diseases affect 42% of patients. In 2014 respiratory system diseases were causes of 20 000 deaths in Poland.[13] The majority of them were a non-chronic diseases, caused by infectious factors. In the group of patients suffering from acute nasopharyngitis, the average age was 23 years of age. But when we looked at the distribution of age, it showed us, that suffering patients were very young people or elderly people, which is consistent with immunity changes during lifetime. Chronic diseases were represented by asthma (1.6% of all cases) and other obstructive disease which created less than 5% of all respiratory diseases. Asthma results, compared to Australian GP office, are a little bit lower.[9]

As standardized death ratios showed, despite the fact that chronic respiratory system diseases are rare cases in GP practices, they are a common cause of death.[13] In Luxembourg, where expenses for healthcare are higher than in Poland, the death rates are slightly lower.[12,13] Also, the influenza in Poland has the lowest standardized death rates, and is not recognizable in the GP's office.[13]

Comparing the most commonly occurring diagnosis and medical problems in GP's obtained by our analysis in Poland and compared to data presented by Australians, top 30 is slightly different. In both analysis the top three diseases were: hypertension (in both about 6%) and acute laryngopharyngitis.[12] Also in the top 30 were atrial fibrillation and immunization/vaccination visits. Top 15 diagnosis in our study and Australians' related to medication prescribing. But the difference was in the frequency of this issue – 24,1% in Polish GP's office and 1,6% in Australian GP's office.[9]

6. CONCLUSIONS

The most common diagnosis of GP's consultation reflects main health problems of the population. But the most common reason to see a GP is to prescribe medicines. Also, the problems like hypertension and acute laryngopharyngitis are the most common in family doctor office not only in Poland, but also in other continent – Australia and New Zeeland.

Conflict of interest
The authors declare no conflict of interest.

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