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Morbidity Trends of Elderly People Registered in Croatian Family Practice: A Longitudinal Study Based on Routinely Collected Data

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A B S T R A C T

The research aim was to determine the overall morbidity trends in Croatian elderly population. The morbidity data recorded in family practice (FP) were extracted from Croatian Health Service Yearbooks for the years 1995–2012. The percentage of diagnoses in elderly people registered in FM was always higher then their shares in overall population, and with increased trend by 121%. The most frequently registered diagnostic groups were cardiovascular and neoplasms, followed by the groups of endocrine, urogenital and musculoskeletal diseases. The less frequently registered were the groups of infectious disease, injuries and ear diseases. However, the situation is somewhat different when looking at the amount of the increase. The Z codes increased the most, followed by endocrine diseases and neoplasms. Again, the less pronounced increase was observed in the groups of respiratory diseases, musculoskeletal, infectious diseases and injuries. The growing number of the older people and changing morbidity patterns will obviously influence both the entire society and the health care system. A new clinical and cost effective models of practice would be needed as well as the different models of personnel training.

Key words: *elderly, morbidity, family medicine, Croatia*

Introduction

The first step in the assessment of the population health care needs, necessary for the health service planning, is the determination of the morbidity patterns. According to general theory of epidemiologic transition, the long-term changes in health and disease patterns in society are related to demographic and social conditions in the country[1,2]. Croatia, as many other developed countries, is confronting with the ageing of the population. Therefore, the changes in disease patterns could be expected. In June 2004 Croatia approximately counted 4 439 400 inhabitants, where of the number of older than 65 years was 738 500 (16.6% and 17.7% in 2011)[3]. That is the reason why many efforts in Croatia were targeted to the elderly population, including those from health care perspectives. In recent time, the postgraduate study in gerontology, reference centre for gerontology, and a geriatric specialty were established[4–6].

Many researches related to the health and social needs of elderly populations, as well as the organizational structure of provision of care, were also conducted[7–9]. A few that were performed in relation to the morbidity patterns in elderly were small in scale and in duration[10,11]. Therefore, this study was undertaken with the main aims to investigate the overall morbidity trends recorded in Croatian family practice (FP) between 1995 and 2012 and to determine the trends in specific disease categories that had exhibited the most prominent changes.

Methods and Materials

The study is observational and retrospective, based on national statistics, routinely collected data. From the Croatian Health Service Yearbooks, the Croatian Institute of Public Health, the morbidity data recorded in family practice (FP) from all over Croatia were extracted for the years 1995–2012[12]. Data from the Yearbooks were

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based on FP records, in electronic forms since 2008. The morbidity data were registered based on the Instructions how to use for primary and secondary health care report forms. Due to those Instructions, the first visit of a patient suffering from a chronic condition in a calendar year is registered as a morbidity case. If patient comes for the first time with multiple chronic diseases, all of them are registered as separate morbidity cases in that calendar year. If a patient suffers from an acute disease, only the first visit is registered as a morbidity case. All subsequent follow-up visits are not registered as morbidity. This could continue until a disease was cured, and if the patient felt well the case was closed. If the same patient returns in the consecutive year for the same acute diagnosis, it is registered as a new morbidity case[13]. In Croatia, the International Disease Classification, version 10 (ICD-10), is used to register morbidity. In the yearbooks, all recorded diagnoses are presented in the leading categories of diseases according to the classification (A-Z codes) and only some are shown separately within each category. Morbidity is registered according to the patient's age group: 0–6 years, 7–19 years, 20–64 years and over 65 years.

All data were collected exactly in the way they were presented in the yearbooks and for the consecutive years. The number and percentage of people over 65 years and the number of the registered diagnoses according to the ICD-10 classification in that age group were collected. Subsequently, the total morbidity due to the patients' age and the average number of diagnoses per patient were calculated. Additionally, the specific morbidity within the diagnostic's groups with the most observed increase during the period under the investigation was calculated: different reasons for visiting a doctor (Z codes), endocrine (E codes) and malignant (C codes). Symptoms and sings (R diagnostic code) was excluded in deeper analysis because it contained only two subgroups and the one contained almost all cases.

The epidemiological descriptive observational method free from artificial manipulation of the study data (factors) was used in the study[14]. The collected data were analyzed using Microsoft Office (Excel) software.

Results

According to the Census, the percentage of elderly people (those over 65 years) was continuously growing, from 13.1% in 1991 to 17.7% in 2011; around 0.2% per year during ten years period. The percentage of diagnoses in elderly people registered in FM was always higher then the shares in overall population, with increased trend from 26% to 32%. In 2001, on average 2.5 diagnoses per elderly patient were registered, compared with 5.3 diagnoses per patient in 2011 (Figure 1).

The share of diagnoses of elderly patients in total diagnoses was not equally distributed. The percentage of diagnoses of infection (A00-B99) and respiratory diseases (J00-J99) was smaller than the percentage of the elderly people in total population. The percentage of diagnoses

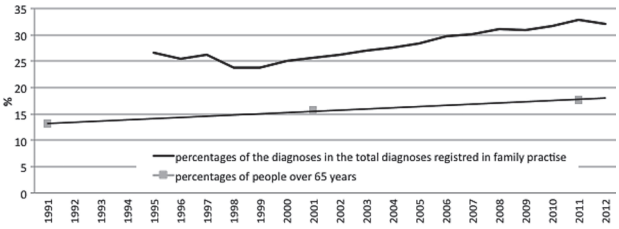

Fig. 1. The percentages of people over 65 years in Croatia (Census in 1991, 2001, 2011) and the percentage of the diagnoses in the total diagnoses registered in family practice, 1995–2012.

of injuries (S00-T98) was almost as equal and that of benignant neoplasm's (D50-D89), somewhat above the percentage of the elderly population. However, the percentages of cardiovascular (I00-I99), endocrine (E00-E99), malignant (C00-D48) and musculoskeletal diseases (M00-M99) were significantly above the share of the elderly in total population; cardiovascular for more than 3 times more, and the other noted above for more than twice more (Figure 2).

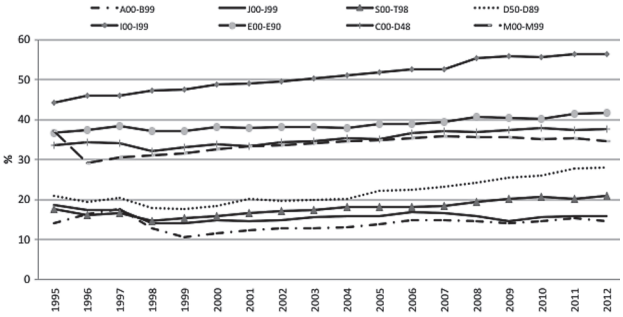

Fig. 2. The percentages of the diagnoses according to the diagnostics' groups in elderly people in total morbidity registered in family practice in Croatia, 1995–2012.

During the 18-year follow-up period, the most frequently registered diagnostics' groups were cardiovascular and malignant diseases, followed by the groups of endocrine, urogenital and musculoskeletal diseases. The less frequently registered were the groups of infective, injuries, ear diseases and diagnostic codes related to the different reasons for visiting a doctor (Z-codes). In 2012, a situation is somewhat different. The most frequently registered groups were cardiovascular, musculoskeletal, endocrine, urogenital and Z codes. The less frequently registered were the groups of neoplasm's, injuries, ear diseases, infections and neurological diseases (Table 1).

All diagnostic groups increased in numbers from 1995 to 2012, but not in the same quantity. The Z codes increased the most, for 896%, followed by endocrine (560%) and malignant diseases (460%). The less pronounced increase was observed in the groups of respiratory diseases (110%), musculoskeletal (170%), infection disease (220%) and injuries (240%).

The specific diagnoses within the fast increasing diagnostics' groups (Z codes, endocrine and malignant diseases) are presented in the following figures 3, 4 and 5.

TABLE 1
THE ABSOLUTE NUMBERS OF DIAGNOSES DUE TO THE DIAGNOSTIC'S GROUPS IN 1995 AND IN 2012, THE PERCENTAGE OF INCREASE AND THE OVERALL RANK IN 2012

IDC-X codes	Diagnostics' groups	No dgs 1995	No dgs 2012	% of increase	Rank 2012
A00-B99	Infection and parasitic diseases	26459	58600	220	17
C00-D48	Malignant and in situ neoplasm's	26307	120045	460	12
D50-D89	Benignant	54761	180657	330	10
E00-E90	Endocrine diseases	64141	361314	560	3
F00-F99	Mental disorders	88183	217708	250	7
G00-G99	Neurological diseases	27238	60913	220	16
H00-H59	Diseases of eyes	88183	217708	250	8
H60-H95	Diseases of ears	35383	79840	230	14
I00-I99	Cardio-vascular diseases	353066	817297	230	1
J00-J99	Respiratory diseases	266690	281102	110	4
K00-K93	Gastrointestinal diseases	88391	208538	240	9
L00-L99	Skin diseases	61132	168777	280	11
M00-M99	Musculoskeletal diseases	279004	471780	170	2
N00-N99	Uro-genital diseases	93122	250696	270	5
R00-R99	Symptoms, sings and indifferently diagnoses	16518	63445	380	15
S00-T98	Injuries and traumas	44543	107932	240	13
Z00-Z99	Different reasons to visiting a doctor	28224	252995	896	6

Among different reasons for visiting a doctor (Z codes), the most prominent increase was observed in the group of reasons connected with the infectious diseases, in our case used to acknowledge preventive measures, mainly influenza vaccinations (4210% increase). The second was the group of family problems as the reasons to visit a doctor (1190% increase) followed by the group with needs for additional investigations as the reasons for visits. The needs for domestic help also increased twice as much (Figure 3).

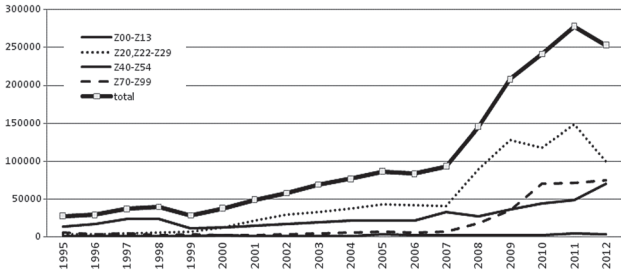

Fig. 3. The trends in the numbers of specific diagnoses within the group of Z codes registered in the elderly patients in family practice in Croatia, 1995–2012.

Within the group of endocrine diseases, the highest increase was recorded in the group of other endocrine diseases and nutritional and metabolic diseases (1250%), followed by the increase in the disorders of thyroid gland (570%). The number of diabetes diagnoses increased as well (330%). However the number of diagnoses of obesity decreased by 210% (Figure 4)

Within the group of malignant diseases (Figure 5), the greater increase was observed in the group of the non-

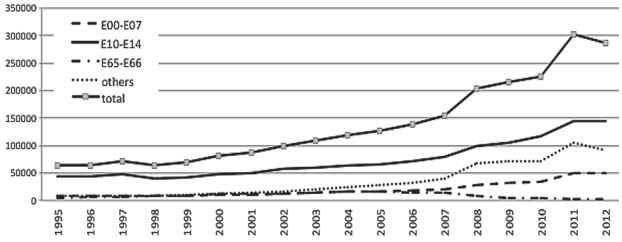

Fig. 4. The trends in the number of specific diagnoses within the group of endocrine diseases registered in elderly patients in family practice in Croatia, 1995–2012.

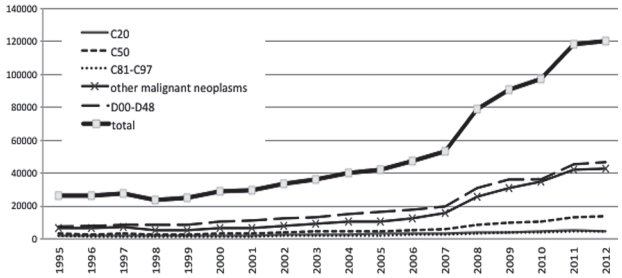

Fig. 5. The trends in the number of specific diagnoses within the group of neoplasm are registered in elderly patients in family practice in Croatia, 1995–2012.

-classified malignant diseases (increase by 670%) and the group of neoplasm in situ. The highest increase was observed in the case of breast (430%) and colon cancer (260%).

The number of diagnoses labeled as the symptoms and sings also increased, mostly within the codes of oth-

ers (increase by 660%), while the number of diagnoses of senility decreased by 890%. A deeper analysis within the diagnostic groups indicated that some specific diagnostic categories showed continuous decrease. In the group of infectious disease, decreased number of tuberculosis and helminthiases were observed. Within the group of respiratory diseases, the number of acute respiratory infection and influenza decreased, and the decrease in number of gastro duodenal ulcer diagnoses, cholelithiasis and cholecystitis was noted as well.

Discussion

During 18-year follow-up period, the percentage of diagnoses in elderly people registered in FM had always been higher than their shares in overall population with the increase in trend by 121%. The most frequently registered diagnostic groups were cardiovascular and malignant, followed by the groups of endocrine, urogenital and musculoskeletal diseases. The less frequently registered were the groups of infectious diseases, injuries and ear diseases. However, the situation is somewhat different when looking at the amount of the increase. The number of Z codes increased the most, followed by endocrine diseases and malignant. Again, the less pronounced increase was observed in the groups of respiratory diseases, musculoskeletal, infectious diseases and injuries. Looking at the specific diagnostics categories, the most prominent increase within the Z-codes was observed in the group of reasons connected with the infectious disease (in our case, influenza vaccinations) and in the group of family problems. Increase was observed in nutritional and metabolic diseases, disorders of thyroid glands and diabetes, while the number of diagnoses of obesity decreased. More pronounced increase was observed in the group of the non-classified neoplasm and the neoplasm in situ, as well as in the cases of breast and colon cancer. The decrease was observed in tuberculosis and helminthiases, acute respiratory infections and influenza, as well as in gastro duodenal ulcer, cholelithiasis and cholecystitis.

The overall results are not unexpected if we take into the account the Compression of Morbidity paradigm explaining that the most cases of illness were chronic and occurred in later life, resulting in the high ratio of multi-morbidity among older population[15–17]. The phenomenon is visible from the results of this study. In 2012, 5.3 diseases per elderly patient were recorded, while in overall population 3.8 diseases per patient were recorded[18]. However, the trends on the number of diagnoses per patients in both studies are increasing during 18 years of follow-up. It is not clear from the results why the same patient is getting more diagnoses annually. Especially sharp increase in the number of diagnoses that may be explained with the introduction of e-medical records was observed from 2008 onwards. It could also imply a better registration of the diagnoses, especially among people with multiple chronic diseases[19,20]. However, it could be an indication to the phenomenon of overdiagnoses[21]. The high number of diagnosis per patient is especially important under the notion that people with more established diseases use health care more frequently with subsequent increase of the rate of health care utilization and the costs[22].

Despite the fact that many studies related to the health and diseases in elderly people have been published, we did not manage to find any single longitudinal and population study related to the general morbidity patterns in elderly based on ICD-10 classification and comparable to the results of this study. Therefore, we made a comparison with aforementioned study based on entire population, done by Depolo and colleagues[18]. They also found increase in the number of cases in all diagnostic categories similar to this study. However, the amount of increase was not the same in both studies. For instance, the increase in infectious and parasitic diseases, as well as the respiratory and musculoskeletal diseases and injuries was comparable. The increases in other diagnostic categories are much more pronounced among elderly than within entire population, especially in cases of benign neoplasm, endocrine and urogenital diseases. Symptoms and signs diagnoses are only diagnostic category with more pronounced increase in entire population. As previously being mentioned, the different reasons to visiting a doctor (Z codes) increased much more among elderly than within the whole population[18]. It could be related to the national recommendation for the influenza vaccinations, being recorded within Z code. However, it could also be related to the changing attitudes of elderly patients as well as FD's to openly discuss family problems and needs for home help without covering them under other diagnostic codes. The increases in endocrine disorders are already seen in Slovenia and UK, especially diabetes and thyroid gland disorders. It is obviously related to the changing life styles, including elderly population; it is still unclear whether the lowering of the diagnostic criteria for diabetes could have some influence[23,24]. The increase in the number of breast and colon cancer cases could be related to the preventive programs introduced in 2006. Having in mind the findings that between 30% and 40% of community dwelling persons aged 65 years or older fall at least once per year, we expected much more cases of injuries, but the number was found comparable to entire population[25]. It was expected that number of mental disorders would highly increase as well, having in mind the high rate of utilization of psychotropic drugs in Croatia[26].

This study is the first one in Croatia following the morbidity trends in elderly patients for a long period of time, which allows us to make the conclusion that the trends are not temporary. The trends were possible to follow up because the data were based on same sources that included annual routine reports from all family practice units in Croatia and because the data were collected and presented in the same manner during the entire follow-up period, from 1995 to 2012. Data should be perceived as valid because all health workers in Croatia responsible for data collection, including family doctors,

passed education and additionally the quality of data were checked twice, firstly at counties level and then at the national level. Additional strength of the study lies in the fact that data come from national health statistics system, enabling national comparisons between countries and international comparisons with those countries using ICD-10 shortlist classification for morbidity[27]. However, it is important to emphasize that it is a condensed morbidity list, with aggregation of some items, which does not allow complete insight into population morbidity. While the data allow possibility to investigate the trends, a deeper understanding of complex issues such as elderly morbidity is not possible, especially the underlining factors and possible consequences. Additionally, the observed morbidity trends should not be miss--matched with the morbidity of elderly population in theoretic sense. They mainly represent the reasons of FP utilization by elderly patients. Other limitation is inclusion of Z codes to »morbidity« list which presents different reasons for contact with health care services of a person not currently sick, or circumstances in which the patient is receiving care at that particular time or otherwise having some bearing on the person's care. The main reason for using Z chapter in »morbidity« list for elderly patients is registering of preventive activities, such as influenza vaccinations. Further limitation of the study could be the partially presented results. It was done because the results amount was far away of the scope of one article.

Besides the limitations, the study results might be helpful in health policy planning, especially if we take into consideration that demographic projections for the year 2025 in Croatia show an increase in the percentage of elderly people up to 27.4%. Because of the demographic ageing of the population, there is a constant economic and social welfare challenges in front of Croatian society[28]. Furthermore, the growing number of the older population and changes in morbidity pattern, which were observed during the follow-up years, will obviously influence the entire health care system. The new organizational models of health care delivery for elderly should be searched and tested to find the most clinically and cost effective ones. The attention should also be paid to the new clinical approaches in solving certain problems as well as new educational and research strategies to deal with this problems[29,30]. Therefore, the study could be an encouragement to other colleagues to join the effort to enlighten the problem of specificity of elderly morbidity.

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TRENDOVI KRETANJA POBOLA LJUDI U HRVATSKOJ: LONGITUDINALNA STUDIJA, 1995–2012

S A Ž E T A K

Cilj studije je bio utvrditi trendove kretanja pobola ljudi starijih od 65 godina u Republici Hrvatskoj. Podaci su prikupljeni iz Hrvatskih zdravstveno-statističkih ljetopisa, za period 1995.–2012. godine. Rezultati studije su pokazali da je broj bolesti po jednom pacijentu porastao sa 2,5 na 5,3 dijagnoze. Najčešće su zabilježene kardiovaskularne, maligne, endokrine, urino-genitalne i muskuloskeletne bolesti. Manje su prisutne infektivne bolesti i povrede. Međutim, trendovi rasta nisu bili ravnomjerni. Najviše su porasle dijagnoze iz Z kategorije, dolasci bolesnika zbog drugih, a ne medicinskih razloga. Porast je uočen i u grupi endokrinih bolesti, osobito bolesti štitne žlijezde i dijabetes, kao i neoplazme. Međutim, značajan porast nije zabilježen u grupi kardiovaskularnih niti muskuloskeletnih bolesti. Rastući udio starije populacije i promjene u strukturi morbiditeta će vjerojatno imati utjecaja ne samo na zdravstveni sustav nego i cijelo društvo. Rezultati upućuju na traženje novih modela zdravstvene zaštite starijih ljudi i obrazovanja zdravstvenih radnika. U radu su prezentirani samo najznačajniji trendovi, pa je istraživanje pobola potrebno nastaviti, osobito o mogućim uzrocima promjena.