STROKE EPIDEMIOLOGY IN SLOVENIA

Bojana Žvan

Clinical Department for Vascular Neurology and Neurointensive Therapy, Division of Neurology, University Medical Centre Ljubljana, Slovenia

Introduction

Stroke is a global health problem and a leading cause of adult disability[1]. Out of 35 million deaths attributable to chronic non-communicable diseases that occurred worldwide in 2005, stroke was responsible for 5.7 million (16.6%) deaths and 87% of these deaths occurred in low- to middle-income countries[2]. Driven by increased aging of the populations across the world, together with escalating prevalence of risk factors such as hypertension, tobacco use, unhealthy diet, lack of physical inactivity and obesity, stroke is becoming a major cause of premature death and disability in developing countries[3].

In the western world, stroke represents the second most frequent disease; it immediately follows heart diseases (even before cancer) and accounts for 10% of all deaths[4]. In Europe, however, it is the third most common cause of death, ranked immediately after ischemic heart disease and before cancer. The burden of disease and health care costs of stroke are very high because of severe neurological consequences such as hemiplegia, cognitive deficits and others.

Slovenia, with 2 million inhabitants, is undergoing economic and demographic changes in recent years resulting in an improvement of lifestyle-related cardiovascular and cerebrovascular diseases. We place greater and greater emphasis on population-based stroke prevention strategies. The reported frequency, pattern, risk factors and outcome of stroke in Slovenia are largely derived from hospital-based observations, National Health Institute and National preventive programme for prevention of chronic diseases (CINDI)[5].

Zaloska 2a, 1000 Ljubljana
E-mail: bojana.zvan@kclj.si

In our country men are more susceptible to stroke than women with more severe outcomes in men. Women live longer and on average reach older age when they are first hit by stroke. In 2008, vascular brain diseases together led to 10.6% of all deaths, 90.2% of them occurred in people over 64 years of age. Since 1997, around 200 admissions to the hospitals due to brain vessels diseases per 100,000 inhabitants were recorded every year. Stroke in our country is also a leading cause of life-long handicap. Framingham Heart Study found that 31% of people who have survived a stroke, after seven years still needing help with daily living tasks with 20% needing help to walk and 71% of them having difficulties carrying out their work[6].

This paper presents data on health statistics on stroke and assessment of differences in mortality and morbidity from stroke, by sex and age groups in Slovenia. Shown are data of the Institute of Public Health of the Republic of Slovenia[7].

Methods

The charts (Figure 1, 2, 3) show the analysis of outpatient stroke data including the first visits to general and specialist outpatient clinics, information on absence from work, database aggregated by diagnosis, hospital care database that includes all treatments and recoveries in the first year; and deaths data, which were collected from medical death certificates and reports on causes of death or from the application form DEM-2 (demographic application form 2). The calculations are for 2004 to 2008. Population data, necessary for calculating rates are taken from the corresponding individual yearbooks of the National Statistical Office[7].

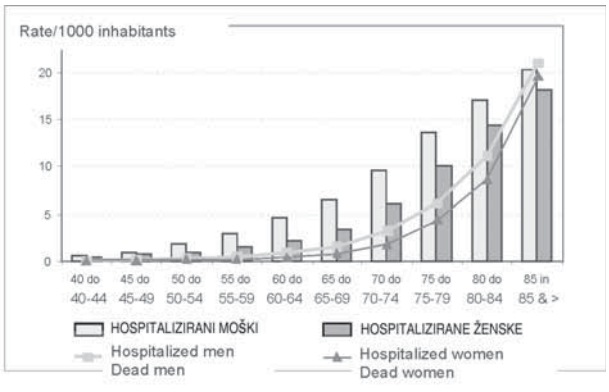
Results

In Slovenia, stroke is not among the three most frequently causes to be managed in the general or specialist outpatient clinics and is not even among the most frequent causes of admission to the hospitals, but it is the third most common cause of death among women. Basic epidemiological data which should be included in each management of population are gender, age, and some individual characteristics, which in Slovenia include the statistical regions of residence and cause of illness or death.

Gender and age

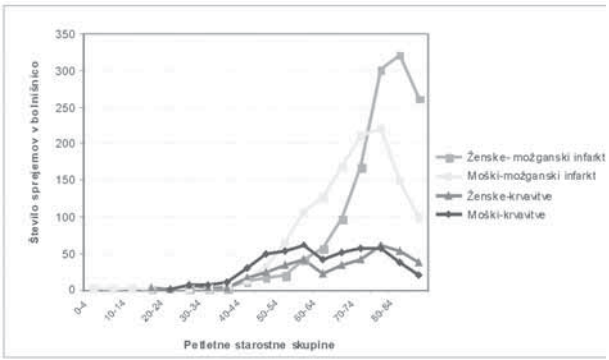
In the year 2008 stroke occupied 1.1% of visits for men and 0.7% of the women's visit in a general outpatient clinics. Similar data were obtained from specialized outpatient clinics, while among all hospital admissions for stroke 3.2% and 10.6% deaths in men and women, respectively, among all deaths were recorded. For each patient taken to the hospital there were 2.4 visits in the primary care and 2.3 visits in the specialist outpatient clinics prior to hospital admission. We found that the number of admissions to the hospitals increased with age in both men and women, but in all ages it was greater in men than in women. The same ratio applied to mortality. About 40 % stroke patients died at home, while 60 % in the hospitals.

In 2008, brain infarction represented the largest share of hospitalized patients in the county, both in men (61.8% of brain infarction) and in women (66.1% of brain infarction). Cerebral bleedings accounted for 24.6% and 19.2% of hospitalized patients in men and women, respectively, while other hospital treatments were intended to undefined types of stroke or late effects of stroke. Hospital care for ischemic stroke increased rapidly between the ages of 50 and 80 in men, the same trend occurred in women, but with an approximate 10 year delay. The number of cerebral bleedings was lower in women, however, we observed a modest increase till the age of 80, while this value in men over 50 reached a steady plateau.



Source: NIH RS
Stroke types

Figure 1. Mortality rates at home and in the hospital care per 1000 people by five-year age groups and gender in Slovenia, 2004-2008.



Source: NIH RS

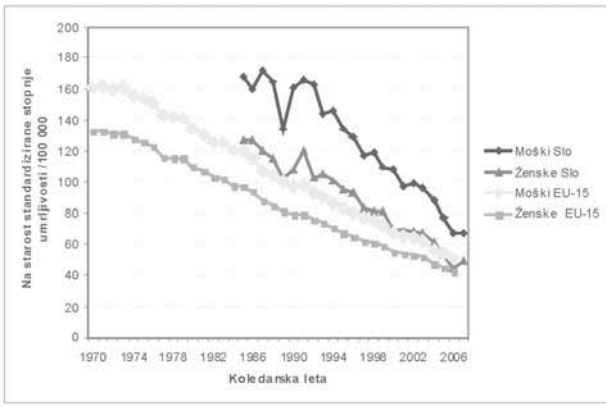
Figure 2. The number of hospital admissions for ischemic stroke or brain bleeding in Slovenia in 2008: comparison by gender.

Bleeding was the cause of death in 26 hospitalized men and an equal number of women per 100 hospitalizations, while ischemia was the cause of death in 12.8 men and 17.4 women per 100 hospitalized patients. The majority of deaths due to bleeding or ischemia occurred within a few days after admission to the hospital. Deaths due to late effects of stroke occurred in 63% of all the patients; more commonly at home than in hospitals.

Hospital care and mortality rate due to stroke in Slovenia in comparison with old member countries of EU15

Stroke mortality rate in Slovenia as well as in the old EU member countries (15) is higher among males than among females. Women's mortality rate due to stroke in Slovenia in the year 2006 was comparable to the mortality rate of women in EU15. Intriguingly, stroke mortality in males appears to be significantly higher in Slovenia than in the old EU member coun-

tries despite a comparable trend towards a decrease in overall make stroke mortality rates.



Source: HFA data base

Figure 3. Evolution of mortality due to stroke in Slovenia in comparison with the average mortality in the old EU members, by gender, in the period from 1970 and 1985 to 2007

Discussion

In this paper we discuss data obtained from health statistics based on the basic epidemiological guidelines describing the occurrence of stroke in Slovenia. Assessment of the extent and severity of cerebrovascular diseases in our country is closest to the data from hospitalizations, which together with mortality rates bear the greatest share of the burden of stroke. The analysis of available data showed that the number of admissions to the hospitals and mortalities due to stroke are greater in men than in women, for men these parameters rise rapidly after 50 years of age, while in women 10 years later. Mortality rates for stroke in Slovenia from 1985 onwards have been falling and for women reached data characteristic of the EU 15 countries.
To increase the relevance of our data on the causes of death from stroke we should perform the comparative analysis of the causes of deaths reported by hospitals, and those recorded by coroners in the medical certificate of death.

Stroke is also the leading cause of life-long handicap, therefore it is important to prevent this disease and its consequences. The decrease in mortality due to stroke can reduce the incidence or outcome of successful treatment and, therefore, extended survival or both. The reduction of stroke incidence also supports successful health promotion campaigns focusing on risk factors such as high blood pressure, diabetes, cardiac diseases, elevated cholesterol, smoking, etc… (5). At the same time, there has been an extended survival after stroke and reduced level of invalidity, which both stem from improved treatment of the stroke, in particularm in its acute phase.

Conclusion

Stroke among all diseases advocates for a substantial proportion of hospital care. Mortality rate due to stroke over the last quarter-century significantly decreased, but in our country it still remains the third most common cause of death in women. A large proportion of ischemic stroke risk factors suggest the same as for ischemic heart disease. Health promotion in the prevention of stroke should be targeted mainly at men.

References

1. DONNAN GA, FISHER M, MACLEOD M, DAVIS SM. Stroke Lancet. 2008; 371: 1612–1623.
2. STRONG K, MATHERS C, BONITA R. Preventing stroke: saving lives around the world. Lancet Neurol. 2007; 6: 182–187.
3. World Health Organization. The World Health report 2004: changing history. Geneva: WHO, 2004.
4. The World health Report 2004. Annex Table 2: Deaths by cause, sex and mortality startum by WHO regions, estimates for 2002: Geneva World Health Organization, 2002.
5. http://cindi-slovenija.net/images/stories/dokumenti/Zbornik_skupajvarujemozdravje_09.pdf
6. CARANDANG R, SESHADRI S, BEISER A, KELLY-HAYES M, KASE CS, KANNEL WB, WOLF PA. Trends in incidence, lifetime risk, severity, and 30-day mortality of stroke over the past 50 years. JAMA, 2006; 296: 2939-2946.
7. ŠELB J. Epidemiologija možganskih bolezni. In: Žvan B, Zaletel M, eds. Akutna možganska kap V. Ljubljana: Društvo za preprečevanje možganskih in žilnih bolezni, 2010: 25-32.