第12回国際農村医学会報告

MORTALITY FROM, INCIDENCE AND PREVALENCE OF STROKE IN A RURAL AREA OF JAPAN ACCORDING TO A COMMUNITY-BASED REGISTER SYSTEM

H. Nakagawa[1], M. Tabata[1], Y. Naruse[2], K. Miura[1], M. Senma[1], M. Nishijo[1], Y. Morikawa[1], S. Kawano[1], S. Kagamimori[2], T. Kato[3] and M. Honda[3]

1 Department of Public Health, Kanazawa Medical University, Ishikawa Japan
2 Department of Community Medicine, Toyama Medical and Pharmaceutical University, Toyama, Japan
3 Oyabe Health Center, Toyama, Japan

ABSTRACT

Mortality from stroke in Japan has been on the decrease since 1966. An analysis of the death statistics alone will not accurately reflect the incidence and prevalence of stroke. In Japan, there is little information about the incidence and prevalence of stroke and the changes which have occurred based on a longitudinal study in a community.

The purpose of this study was to clarify the mortality from, incidence and prevalence of stroke, and record the changes in these three indices using a community-based register. The Oyabe Health Center (with a population of about 49,000) has kept a register of patients with stroke living within its jurisdiction.

In the fifteen years from 1977 to 1991, the total number of persons who died from stroke was 1,282, and the number of patients who experienced a first stroke was 2,025. The average annual mortality rate of stroke per one thousand persons was 1.75 (1.70 for men and 1.79 for women), and the average annual incidence rate was 2.76 (3.08 for men and 2.46 for women). The prevalence rates at the end of every year between 1977 and 1991 ranged from 11.0 to 15.9 (for the 1,000 persons), and the mean value was 13.9 (16.8 for men and 11.1 for women).

The 15-year period of observation was divided into five 3-year periods, and changes in the rates of the three indices of stroke were examined. The 3 indices were age-adjusted to the average of the study population. In contrast to the figures over the same periods for stroke incidence and mortality, there was no decrease in the trend of stroke prevalence. Moreover, the number of patients has increased approximately 1.5 times over the same periods.

Therefore not-with-standing the down-ranking of stroke as a cause of death and the relative decline in numbers of deaths caused by stroke, these observations indicate the continuing importance of regional programs for the control and prevention of stroke. Observations that the proportion of patients with slight or lesser degree of sequela is increasing, and the proportion of patients who are bed-ridden remains unchanged over the ten years remains as an

important focus for further studies.

INTRODUCTION

Japan is well known to be a country with a higher mortality rate and incidence of stroke, compared with European countries and the U.S.A[1]. In the past decades, much research and many reports have noted a decline in mortality rate and incidence of stroke[2, 3]. In Japan, as well, the mortality rate from stroke has decreased since 1966 and the trend has been particularly remarkable since 1971[4]. This change is partially explained either by a decline in the incidence of stroke or by an improvement in the survival rate. In an aging population the decline in both incidence and mortality of stroke may not necessarily lead in the same direction of the prevalence. However, no report on the prevalence of stroke is yet available in Japan.

In an area where the Oyabe public health center is responsible, community registration of the patients with stroke has been made since 1966. Using this registration system, we investigated the incidence and pervalence of stroke during the fifteen years from 1977 to 1991 and compared this with the mortality rate over the same period as well as their changes over time.

METHOD

The subjects are all inhabitants within the district belonging to Oyabe Health center district (Oyabe city and Fukuoka town, 49,000 population). The district is located in the west of Toyama prefecture (Fig.1). Most of its areas are agricultural ones where rice crop is dominant, although there are a few urban areas both commercial and residential. Most patients are reported to the register by

Fig 1. Study Area and 1st Location in Japan

the physicians who diagnosed the condition. Information is also provided to the center by public health nurses and volunteers concerned. To help ensure the completeness of the registry system, we also check death certificates, social insurance records and registers of calls for ambulance services. After a patient has been registered, a public nurse visits either the patient or the family, and has an interview to collect necessary information.

The diagnosis of stroke is principally made on the reference to the diagnosis of the physician who reported the case, and related to the WHO definition of stroke rapidly developing sign of focal or global disturbance of cerebral function which lasted for more than 24 hours or lead to death with no apparent cause other than vascular source". Based on this definition, cerebral hemorrhage, cerebral infarction and subarachnoid hemorrhage are included, but transient cerebral ischemic attack is not.

For stroke patients, mobility limitation is categorized as Grade A (lying in bed all day long), Grade B (lying in bed occasionally),

Grade C (being able to excrete without the help of others) and Grade D (no difficulty in daily activities).

RESULT

The total number who died from stroke during the fifteen years from 1977 to 1991 was 1,282 (men 605, women 677). Mortality rates by diagnostic category are shown in Table 1. In the Oyabe public health center's territory, the average annual mortality rate during the fifeen years was 1.75 (men 1.70, women 1.79) per 1,000 population.

The number of people who initially developed stroke calculated from the registration system over the fifteen years from 1977 till 1991 was 2,025 (men 1,096, women 929). Incidence of stroke diagnostic category is shown in Table 2. Average annual incidence in the Oyabe public health center's territory during the ten years was 2.76 per 1,000 population (men 3.08, women 2.46).

Table 3 shows the number of patients and the prevalence at end of each year obtained by adding the number of patient registered before 1977 to 2,025 of patients, who had the first attack and then registered during the fifteen years from 1977 to 1991. The prevalence in population was 11.0 per 1,000 at the end of 1977 and 15.9 at most at the end of 1989. After that, the prevalence showed practically no fluctuation and was 15.8 at the end of 1991. The average prevalence in the fifteen years was 13.9 (men 16.8, women 11.1) per 1,000 population. Examination on diagnostic category could not be performed since there were many patients who developed stroke before 1976 and the specification of thier diagnostic category was not available.

Changes in age-adjusted incidence of first stroke episode, prevalence and morality are shown in Fig.2 for men and Fig.3 for women. The average age-adjusted mortality rate of patients in all categories of stroke gradually declined for both sexes.

Table 1 Average annual number who died from stroke ; mortality rates (/1,000 population) by diagnostic category (1977-1991)

Category	Men	Women	Total
All stroke	40.3 (1.70)	45.2 (1.79)	85.5 (1.75)
Cerebral hemorrhage	10.7 (0.45)	10.7 (0.42)	21.4 (0.44)
Cereral infarction	22.1 (0.93)	23.6 (0.94)	45.7 (0.93)
Stroje of undetermined type	7.5 (0.32)	10.9 (0.43)	18.4 (0.38)

Table 2 Average annual number of people who initially developed stroke ; inci-dence rates (/1,000 population) by diagnostic category (1977-1991)

Category	Men	Women	Total
All stroke	73.1 (3.08)	61.9 (2.46)	135.0 (2.76)
Cerebral hemorrhage	15.5 (0.65)	11.7 (0.47)	27.3 (0.56)
Cereral infarction	48.4 (2.04)	39.5 (1.57)	87.9 (1.80)
Stroke of undetermined type	9.1 (0.38)	10.7 (0.43)	19.8 (0.41)

Table 3 Number of patients with stroke event and its prevalence rate (/1,000 population) at the end of each year (1977-1991)

	Men	Women	Total
1977	294 (12.6)	223 (9.5)	527 (11.0)
1978	321 (13.7)	237 (9.6)	558 (11.6)
1979	357 (15.2)	245 (9.9)	602 (12.5)
1980	370 (15.7)	261 (10.5)	631 (13.0)
1981	381 (16.1)	267 (10.7)	648 (13.3)
1982	390 (16.4)	264 (10.5)	654 (13.4)
1983	387 (16.3)	257 (10.2)	644 (13.2)
1984	391 (16.4)	263 (10.4)	654 (13.3)
1985	414 (17.4)	258 (10.2)	672 (13.6)
1986	433 (18.2)	266 (10.5)	699 (14.2)
1987	447 (19.4)	304 (11.9)	751 (15.2)
1988	466 (19.4)	314 (12.3)	780 (15.8)
1989	453 (18.9)	332 (13.0)	785 (15.9)
1990	439 (18.3)	341 (13.4)	780 (15.8)
1991	447 (18.7)	334 (13.1)	781 (15.8)
Mean	339.3 (16.8)	278.4 (11.1)	677.7 (16.8)

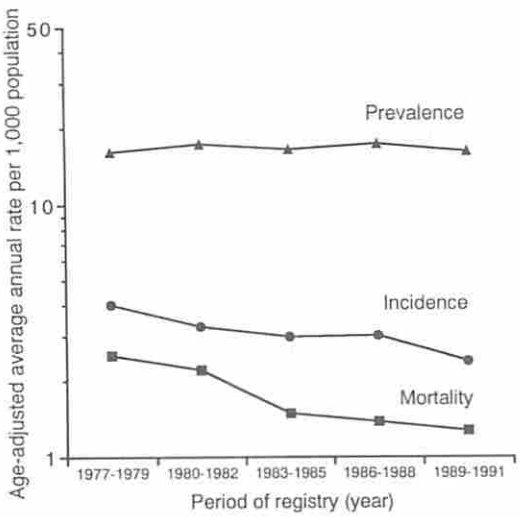

Figure 2. Changes in age-adjusted mortality, incidence, and prevalence of all stroke for men (per 1,000 population).

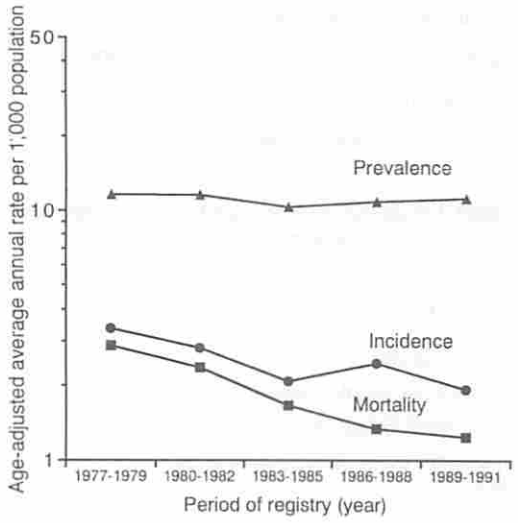

Figure 3. Changes in age-adjusted mortality, incidence, and prevalence of all stroke for women (per 1,000 population).

When the last three-year period (1989-1991) is compared with the first three-year period (1977-1979), the mortality rate in men had decreased to 50 % of that of the latter and mortality rate in women to 43 %.

When the average age-adjusted annual incidence of stroke during the third sub-period (1983-1985) was compared with taht during

the subsequent sub-period (1986-1988), the latter showed a slight increase. Apart from this increase, the incidence, afterwards, showed a tendency to fall in both sexes. When the incidence of the latest three-year period (1989-1991) is compared with that of the first three-year period, the rate decreased to 60 % for men and to 57 % for women.

The average age-adjusted annual prevalence of all stroke for both sexes showed no further increase. When average age-adjusted annual prevalence during the latest three-year period (1989-1991) was compared with that during the first three-year period, almost the same figures of 100 % in men and 96 % in women were observed.

In comparing the distribution of grades for morbidity limitation due to stroke between 1980 and 1991, there is no significant difference in the proportion for each grade (Fig.4). The actual number of Grade A with the most sever limitation, however, increases due to the aging of population over the years.

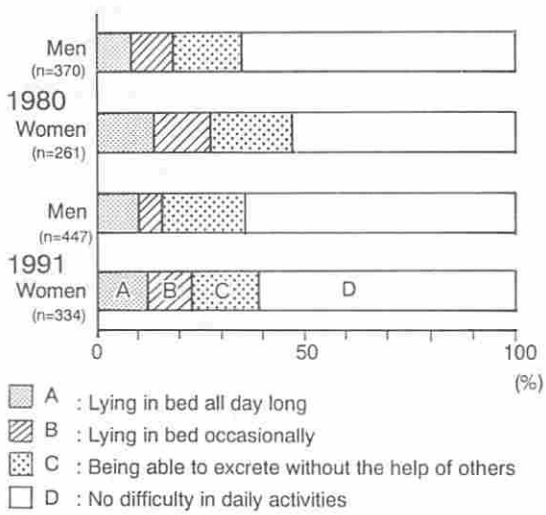

Figure 4. Distribution of mobility limitation status of stroke patients on registry

DISCUSSION

For the community-based register, the accuracy of data collected through the system is essential. At Oyabe Health Center the system of registration has been in operation for over twenty years, and has been improved. Nowdays, notification of the patient by doctors has come to be standard procedure, and it covers more than 80 % of all kinds of notification. The death registration has been initiated from 1977, based on death certificates.

In 1977 and 1980, to avoid any oversight, a simultaneous resurvey of the patients was performed throughout the whole area in cooperation with such community organizations as woman's association, the association of patients with stroke etc. At present, this system has come to be practically complete and 542 (94 %) out of 577 of the patients in our territory at the time of March 1985 can be confirmed using this system. With regard to the rest (6 %) which can be confirmed only by death certificates, most of them died within a week after the occurrence. In recent years, the record of ambulance dis patch is also available, which makes it possible to make the death registration soon after it occurred.

As other epidemiological studies on stroke in Japan have indicated, decline in stroke incidence is also confirmed in the Oyabe Health district. Our previous study on incidence of stroke has demonstrated that incidence of cerebral hemorrhage and infarction shows about 30% decline between 1977-1978 and 1983-1984[5]. As shown in the results, this trend is still continuing.

Concerning the other two parameters, the mortality is declining but the prevalence is

not. In an aging population, decline in the incidence of stroke which develops among the older age group does not necessarily induce changes in the prevalence. Non-decreased prevalence will result in increased numbers of patients. This increase is 1.5 times the figure for fifteen years ealier. Furthermore, an improvement in the survival rate outweighs the effects of the incidence of decline on the burden of stroke in the population.

Regarding the patents on whom the Oyabe public health center obtained information, public health nurses visited the patients' homes and gave them nursing guidance, rehabilitation guidance, and instruction on the prevention of recurrences, etc. all under the responsible doctor's direction. The physical therapist is accompanied, in a necessary case, by a public nurse and gives the patient rehabilitation. Changes in details of nursing services depending on ADL (activities of daily living) of the patients at home over the last 10 years showed the following facts. Such a group where the patients had few late effects and major health guidance from the nurse constituted mere instruction on the prevention of an recurrence, accounted for more than 60 %. Retrospectively, in the latter half of the 1979s the group only accounted for 30−40 %. These facts suggest that the increase in patients with slight stroke can be attributed to non-increased prevalence.

The group in which patients must keep lying on their bed or such like, remained constant at 10 % over the past fifteen years. This indicates an increase in the numbers because of the rapidly aging population. Moreover, about half of those were reported to have developed dimentia[6]. In todays' society with an aging population, it is thought to be important to provide health services in order to improve the quality of life of patients with stroke as well as to encourage their return to the community. In order to achieve this, services such as primary health care and social welfare should be performed cooperatively.

REFERENCES

1. Aho K et al : Cerebrovascular Disease in the Community. Result of a WHO Collab orative Study ; Bulletin WHO 1980 ; 58 : 113-130.
2. Whisnant JP : The Decline of Stroke. Stroke 1984 ; 15 : 160-168.
3. Kotila M : Declining Incidence and Mortality of Stroke. Stroke 1984 ; 15 : 255-259.
4. Tanaka H et al : Secular Trendsin Mortality for Cerebrovascular Diseases in Japan 1960 to 1979. Stroke 1979 : 13 ; 574-581.
5. Nakagawa H et al : Incidence and Survival Rate of Stroke in a Japanese Rural Area according to a Community-Based Register System. IAAMRH Journal 1989 ; 13-1 ; 31-41.
6. Matsubara I et al : A Study on Registry System of Stroke Patients in a Japanese Rural Community. IAAMRH Lournal 1994 : 18-1 ; 31-37.