Aneurysmal Subarachnoid Hemorrhage in Izumo City and Shimane Prefecture of Japan

Incidence

Tetsuji Inagawa, MD, Susumu Ishikawa, MD, Hidenobu Aoki, MD, Masaru Takahashi, MD, and Hisanori Yoshimoto, MD

During the 5-year period from 1980 to 1984, the incidence of subarachnoid hemorrhage due only to rupture of aneurysms was investigated in Izumo City, a small city with a population of 79,026. Additionally, to ascertain the relation of incidence to the size of the geographic area and/or population, a similar analysis was made on a larger area of Shimane Prefecture, including Izumo City, with a total population of 789,712. During this 5-year period, a total of 83 patients with aneurysmal subarachnoid hemorrhage were hospitalized in Izumo City, 548 patients in Shimane Prefecture. Ruptured aneurysms were confirmed in 77 cases (93%) in Izumo City and 466 cases (85%) in Shimane Prefecture. The crude annual incidences of aneurysmal subarachnoid hemorrhage for Izumo City and Shimane Prefecture were 21.0 and 13.9 per 100,000 population for all ages, and the age-adjusted annual incidences (adjusted to the 1980 population of Japan) were 18.3 and 11.0 per 100,000 for all ages, respectively. For both Izumo City and Shimane Prefecture, the age-specific annual incidences peaked at the ages of 50-69 years, and the highest incidence was 92.3 per 100,000 men from Izumo City in the eighth decade of life. The annual incidence of subarachnoid hemorrhage for Izumo City is the highest reported to date. If a wider area, such as Shimane Prefecture, were studied many patients in poor condition, particularly elderly patients, would be missed. To determine accurately the incidence of aneurysmal subarachnoid hemorrhage, it thus might be better to conduct the study in a small city such as Izumo City. (Stroke 1988;19:170-175)

There have been many studies of the incidence of subarachnoid hemorrhage (SAH) with widely varying annual incidences.1-10 Because these studies differ in several points, these incidences cannot simply be compared. First, the geographic area and the population covered by the incidence studies vary. If a large geographic area is studied, a number of SAH patients may be missed. Second, SAH is not a disease but a syndrome, and most published studies have focused on so-called spontaneous, or primary, SAH, which is caused not only by intracranial aneurysm but also by arteriovenous malformation or other diseases. There have been only a very few studies on incidence due only to rupture of aneurysms. Third, diagnostic accuracy also varies in different studies, especially if SAH is diagnosed only by clinical symptoms and signs. Fourth, the denominators for calculating annual incidences vary, with some studies covering the population of all ages whereas other studies are confined to certain age groups.

The purposes of our study were, first, to analyze the incidence of SAH due only to rupture of aneurysm in a small, restricted area of Izumo City, and second, to ascertain the relation of the incidence of SAH to the size of the geographic area and/or population through a similar analysis of the wider area of Shimane Prefecture. We studied only patients in whom aneurysmal SAH was confirmed by computed tomography (CT scan), surgery, or autopsy, and we calculated incidences for a number of age groups for comparison with other studies.

Subjects and Methods

Izumo City is located in the northeastern part of Shimane Prefecture and covers an area of about 175 km². Shimane Prefecture has an area of approximately 6,628 km² (Figure 1). Most residents of this prefecture live in rural communities. Shimane Prefecture has four hospitals with a neurosurgical department: Shimane Prefectural Central Hospital with 665 beds, Shimane Medical University Hospital with 616 beds, Matsue Red Cross Hospital with 750 beds, and Matsue Municipal Hospital with 511 beds. Only the former two hospitals have a neurological department. There are also approximately 10 small hospitals without either a neurosurgical or a neurological department.

In Izumo City, all patients suspected of having SAH are referred to the neurological department of either Shimane Prefectural Central Hospital or Shimane Medical University Hospital. Patients admitted to the neurological department are all transferred to the neurosurgical department. As Shimane Prefectural Central Hospital is a designated emergency center, all patients with a verified or suspected SAH, even though moribund, are immediately admitted to the neurosurgical department irrespective of age and condition. Thus, patients residing in Izumo City are transferred to...
this hospital within approximately 30 minutes. In Shimane Prefecture as a whole, the majority of patients suffering from SAH are transferred to the neurosurgical department of one of the foregoing four hospitals. The cases of our study comprise patients suffering from SAH who were admitted to the neurosurgical department of one of the four hospitals during the 5-year period from January 1, 1980, to December 31, 1984. In our study, suspected cases of aneurysmal rupture were detected based on anamnestic information and clinical findings, and verified cases were those documented to have aneurysmal SAH by CT scanning, surgery, or autopsy; patients having a history of SAH were omitted.

According to the census of Japan, the population of Izumo City was 77,303 as of October 1, 1980, and 80,749 as of October 1, 1985, while the population of Shimane Prefecture was 784,795 and 794,629, respectively. The estimates of incidences in the present study were based on the mean population of 1980 and 1985: 79,026 in Izumo City and 789,712 in Shimane Prefecture. Of the mean populations, 48% were men in both Izumo City and Shimane Prefecture. We calculated the average annual incidences for both Izumo City and Shimane Prefecture. For Izumo City, the crude annual incidence of aneurysmal SAH was 21.0 per 100,000 population for all ages, 29.9 per 100,000 for the 20–89 years age group, and 35.3 per 100,000 for the 30–89 years age group. The age-adjusted annual incidences, using the census population of Japan in 1980, were 18.3 per 100,000 for all ages, 26.5 per 100,000 for the 20–89 years age group, and 32.4 per 100,000 for the 30–89 years age group. For Shimane Prefecture, the crude annual incidence was 13.9 per 100,000 population for all ages, 19.0 per

Results

During the 5-year period from 1980 to 1984, a total of 83 patients with aneurysmal SAH were hospitalized in Izumo City and 548 patients in Shimane Prefecture. All but five patients, who were dead on admission, underwent CT scanning. The age and sex distribution of the patients is shown in Table 1. The diagnostic procedures employed in the confirmation of aneurysmal SAH are shown in Table 2. Of the 83 patients in Izumo City, 77 were admitted to Shimane Prefectural Central Hospital, five to Shimane Medical University Hospital, and one to Matsue Municipal Hospital. The exact location of the ruptured aneurysm was confirmed by angiography or autopsy in 77 patients (93%); 21 of these 77 patients (27%) had multiple aneurysms. Of the six patients in Izumo City in whom ruptured aneurysm could not be confirmed, CT scan showed typical findings of aneurysmal SAH. In five patients the clinical grade was so poor that angiography could not be performed adequately and further autopsy was not performed; one patient autopsy confirmed multiple aneurysms but the rupture site could not be detected. Of the 548 patients in Shimane Prefecture, ruptured aneurysms were confirmed in 466 (85%), and 104 of these 466 patients (22%) had multiple aneurysms. In both Izumo City and Shimane Prefecture, the most common location of ruptured aneurysm was the anterior communicating artery (Table 3).

We calculated the average annual incidences for both Izumo City and Shimane Prefecture. For Izumo City, the crude annual incidence of aneurysmal SAH was 21.0 per 100,000 population for all ages, 29.9 per 100,000 for the 20–89 years age group, and 35.3 per 100,000 for the 30–89 years age group. The age-adjusted annual incidences, using the census population of Japan in 1980, were 18.3 per 100,000 for all ages, 26.5 per 100,000 for the 20–89 years age group, and 32.4 per 100,000 for the 30–89 years age group. For Shimane Prefecture, the crude annual incidence was 13.9 per 100,000 population for all ages, 19.0 per

Table 1. Patients With Aneurysmal Subarachnoid Hemorrhage in Izumo City and Shimane Prefecture of Japan

<table>
<thead>
<tr>
<th>Age (years)</th>
<th>Men</th>
<th>Women</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
</tr>
<tr>
<td></td>
<td></td>
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</tr>
<tr>
<td>0–9</td>
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</tr>
<tr>
<td>10–19</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>20–29</td>
<td>1</td>
<td>2.0</td>
<td>1</td>
</tr>
<tr>
<td>30–39</td>
<td>4</td>
<td>8.0</td>
<td>0</td>
</tr>
<tr>
<td>40–49</td>
<td>10</td>
<td>20.0</td>
<td>1</td>
</tr>
<tr>
<td>50–59</td>
<td>20</td>
<td>40.0</td>
<td>12</td>
</tr>
<tr>
<td>60–69</td>
<td>5</td>
<td>10.0</td>
<td>15</td>
</tr>
<tr>
<td>70–79</td>
<td>8</td>
<td>16.0</td>
<td>3</td>
</tr>
<tr>
<td>≥80</td>
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</tr>
<tr>
<td>Total</td>
<td>50</td>
<td>100.0</td>
<td>33</td>
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Table 2. Results of Diagnosis and Location of Ruptured Aneurysm

<table>
<thead>
<tr>
<th>Districts</th>
<th>Izumo City</th>
<th>Shimane Prefecture</th>
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</thead>
<tbody>
<tr>
<td>Men</td>
<td>Women</td>
<td>No.</td>
</tr>
<tr>
<td>0–9</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>10–19</td>
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<td>2.0</td>
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<tr>
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<td>8.0</td>
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<td>16.0</td>
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<td>2</td>
<td>4.0</td>
</tr>
<tr>
<td>Total</td>
<td>50</td>
<td>100.0</td>
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TABLE 1. Patients With Aneurysmal Subarachnoid Hemorrhage in Izumo City and Shimane Prefecture of Japan

<table>
<thead>
<tr>
<th>Age (years)</th>
<th>Men</th>
<th>Women</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
</tr>
<tr>
<td></td>
<td></td>
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<td>No.</td>
</tr>
<tr>
<td>0–9</td>
<td>0</td>
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<tr>
<td>10–19</td>
<td>0</td>
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<tr>
<td>20–29</td>
<td>1</td>
<td>2.0</td>
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<tr>
<td>30–39</td>
<td>4</td>
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<td>40–49</td>
<td>10</td>
<td>20.0</td>
<td>1</td>
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<tr>
<td>50–59</td>
<td>20</td>
<td>40.0</td>
<td>12</td>
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<tr>
<td>60–69</td>
<td>5</td>
<td>10.0</td>
<td>15</td>
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<tr>
<td>70–79</td>
<td>8</td>
<td>16.0</td>
<td>3</td>
</tr>
<tr>
<td>≥80</td>
<td>2</td>
<td>4.0</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>50</td>
<td>100.0</td>
<td>33</td>
</tr>
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</table>
TABLE 2. Verification of Aneurysmal Subarachnoid Hemorrhage Cases in Izumo City and Shimane Prefecture of Japan

<table>
<thead>
<tr>
<th>Verification</th>
<th>No.</th>
<th>%</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
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<tr>
<td>CT scan only</td>
<td>30</td>
<td>36</td>
<td>182</td>
<td>33</td>
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<tr>
<td>Surgery only</td>
<td>4</td>
<td>5</td>
<td>27</td>
<td>5</td>
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<td>Autopsy only</td>
<td>0</td>
<td>0</td>
<td>4</td>
<td>1</td>
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<tr>
<td>CT scan + surgery</td>
<td>47</td>
<td>57</td>
<td>320</td>
<td>58</td>
</tr>
<tr>
<td>CT scan + autopsy</td>
<td>2</td>
<td>2</td>
<td>10</td>
<td>2</td>
</tr>
<tr>
<td>Surgery + autopsy</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0.2</td>
</tr>
<tr>
<td>CT scan + surgery + autopsy</td>
<td>0</td>
<td>0</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>83</td>
<td>100</td>
<td>548</td>
<td>100</td>
</tr>
</tbody>
</table>

CT scan, computed tomography.

100,000 for the 20–89 years age group and 21.9 per 100,000 in the 30–89 years age group. The age-adjusted rates were 11.0 per 100,000 for all ages, 15.8 per 100,000 for the 20–89 years age group, and 19.4 per 100,000 for the 30–89 years age group (Table 4). The age-specific average annual incidences are shown in Table 5. The peak incidence of aneurysmal SAH in the present study was observed in the sixth to seventh decades of life. Men had a higher incidence than women in Izumo City, but the opposite was the case in Shimane Prefecture. The highest incidence rate was 92.3 per 100,000 men in the eighth decade of life of Izumo City.

Discussion

In the present study, the crude annual incidences of aneurysmal SAH for Izumo City during the period 1980–1984 were 21.0 per 100,000 population for all ages, 29.9 per 100,000 for the 20–89 years age group, and 35.3 per 100,000 for the 30–89 years age group. The age-adjusted rates, using the census population of Japan in 1980, were 18.3 per 100,000 for all ages, 26.5 per 100,000 for the 20–89 years age group, and 32.4 per 100,000 for the 30–89 years age group. Age-adjusted rates were higher than crude annual incidences because Shimane Prefecture, in which Izumo City is located, has one of the highest proportions of elderly residents in Japan; 20.3% of the population is 60 years of age or older compared with 12.9% for Japan as a whole.

It has been reported that the annual incidences of so-called spontaneous or primary SAH were 6.5–23.9 per 100,000 for all ages,1–9 14.3 per 100,000 for the ≥15 years age group,10 15.9–20 per 100,000 for the ≥20 years age group,11,12 and 26.4 per 100,000 for the ≥35 years age group13 (Table 6). The incidences in these published reports are for SAH including bleeding due not only to aneurysmal rupture but also to arteriovenous malformation and other diseases, and furthermore, the diagnosis depended mainly on clinical data. Aho,1 who reported the highest annual incidence of 23.9 per 100,000, has himself alluded to the fact that four of the 13 clinically diagnosed cases (31%) of fatal SAH proved at autopsy to be another type of stroke but the opposite was never observed, and to the fact that after correcting by 31%, the age-adjusted incidence of SAH would be 16.5 per 100,000 annually. Thus, comparing annual incidences of our study with the findings of others is not possible.

Studies have been rarely made of the annual incidence of SAH due only to aneurysmal rupture. The reported incidence for Rochester, Minnesota,9 was 10.8 per 100,000 during the period 1945–1974 for all ages; for Greenland, Denmark,14 9.3 per 100,000 during the period 1976–1981 for all ages; for south Sweden,15 6 per 100,000 during the period 1981–1983 for all ages; and for Framingham, Massachusetts,16 28 per 100,000 during the period 1949–1974 for the 30–88 years age group (Table 4).

At any rate, our findings suggest clearly higher incidences than those reported in other series, and the annual incidence of aneurysmal SAH observed for Izumo City is the highest among those reported to date. The Izumo City cases in our study were only those patients whose diagnosis of SAH was established by CT scanning, surgery, or autopsy, and furthermore, the exact location of the ruptured aneurysm was confirmed in 93% of the cases. The diagnosis of aneurysmal SAH is accurate and thus there are no false-positive cases. As it cannot be considered that all cases of aneurysmal SAH in Izumo City during this 5-year period were admitted to our hospitals, the real incidence must be even higher than that ascertained in our study. Four possible explanations can be provided for the high annual incidence of aneurysmal SAH in Izumo City. First, though the area of the city is only 175 km², with a small population of 79,026, Izumo City has two major hospitals, Shimane Prefectural Central Hospital and Shimane Medical University Hospital. Second, general practitioners in Izumo City have very few beds to hospitalize patients, and thus management of SAH patients by these general practitioners is considered infeasible. Third, Shimane Prefectural Central Hospital is a designated emergency center and SAH patients in Izumo City, even though moribund, can be transferred to this hospital within approximately 30 minutes. Fourth, with the use of new diagnostic techniques such as CT scan, aneurysmal SAH can be readily and precisely diagnosed.

Table 3. Location of Ruptured Intracranial Aneurysm in Izumo City and Shimane Prefecture of Japan

<table>
<thead>
<tr>
<th>Artery affected</th>
<th>No.</th>
<th>%</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal carotid</td>
<td>17</td>
<td>22</td>
<td>126</td>
<td>27</td>
</tr>
<tr>
<td>Anterior communicating</td>
<td>33</td>
<td>43</td>
<td>165</td>
<td>35</td>
</tr>
<tr>
<td>Anterior cerebral</td>
<td>5</td>
<td>6</td>
<td>29</td>
<td>6</td>
</tr>
<tr>
<td>Middle cerebral</td>
<td>22</td>
<td>29</td>
<td>121</td>
<td>26</td>
</tr>
<tr>
<td>Vertebrobasilar</td>
<td>0</td>
<td>0</td>
<td>25</td>
<td>5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>77</td>
<td>100</td>
<td>466</td>
<td>100</td>
</tr>
</tbody>
</table>

No significant difference between Izumo City and Shimane Prefecture.
Inagawa et al  Incidence of Aneurysmal SAH in Japan

In our study, the crude annual incidences of aneurysmal SAH for the entire prefecture of Shimane were 13.9 per 100,000 for all ages, 19.0 per 100,000 for the 20–89 years age group, and 21.9 per 100,000 for the 30–89 years age group, and the age-adjusted rates, using the census population of Japan in 1980, were 11.0 per 100,000 for all ages, 15.8 per 100,000 for the 20–89 years age group, and 19.4 per 100,000 for the 30–89 years age group. The incidence for Shimane Prefecture, which has a population of 789,712, is similar to that of Auckland, which has an almost equivalent population. However, in the Minnesota Study, Whisnant et al have reported that a number of coroner’s cases may never have reached the hospital and that 8% died before being seen for medical attention. Thus, in those populations many patients in poor condition, especially the elderly, are missed, leading to the possibility that observed incidence

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**Table 4. Average Annual Incidences of Aneurysmal Subarachnoid Hemorrhage per 100,000 Population**

<table>
<thead>
<tr>
<th>Study</th>
<th>Study years</th>
<th>Population</th>
<th>Age (years)</th>
<th>Annual incidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Study</td>
<td></td>
<td></td>
<td></td>
<td>Men</td>
</tr>
<tr>
<td>Helsinki, Finland</td>
<td>1954–1961</td>
<td>439,751</td>
<td>All ages</td>
<td>9.4</td>
</tr>
<tr>
<td>Rochester, Minnesota</td>
<td>1945–1974</td>
<td>All ages</td>
<td>7.6*</td>
<td>12.2*</td>
</tr>
<tr>
<td>South Sweden</td>
<td>1981–1983</td>
<td>1,460,000</td>
<td>All ages</td>
<td>25</td>
</tr>
<tr>
<td>Izumo City, Japan (present study)</td>
<td>1980–1984</td>
<td>79,026</td>
<td>All ages</td>
<td>25</td>
</tr>
<tr>
<td>Shimane Prefecture, Japan (present study)</td>
<td>1980–1984</td>
<td>789,712</td>
<td>All ages</td>
<td>25</td>
</tr>
</tbody>
</table>

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**Table 5. Age-Specific Annual Incidences of Aneurysmal Subarachnoid Hemorrhage per 100,000 Population**

<table>
<thead>
<tr>
<th>Study</th>
<th>Study years</th>
<th>Sex</th>
<th>Incidence rates in age groups by years</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>30–59</td>
</tr>
<tr>
<td>Framingham, Massachusetts</td>
<td>1949–1974</td>
<td>Men</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Women</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Total</td>
<td>15</td>
</tr>
<tr>
<td>Rochester, Minnesota</td>
<td>1945–1974</td>
<td>Total</td>
<td>3.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>25–34</td>
<td>35–44</td>
</tr>
<tr>
<td>Helsinki, Finland</td>
<td>1954–1961</td>
<td>Men</td>
<td>0.3</td>
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<tr>
<td></td>
<td></td>
<td>Women</td>
<td>0.3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Total</td>
<td>0.3</td>
</tr>
<tr>
<td>Greenland, Denmark</td>
<td>1976–1981</td>
<td>Total</td>
<td>0</td>
</tr>
<tr>
<td>Izumo City, Japan (present study)</td>
<td>1980–1984</td>
<td>Men</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Women</td>
<td>0</td>
</tr>
<tr>
<td></td>
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<tr>
<td>Shimane Prefecture, Japan (present study)</td>
<td>1980–1984</td>
<td>Men</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Women</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Total</td>
<td>0</td>
</tr>
</tbody>
</table>

* Rates calculated by present authors from graphs in cited references.
Tables 1 and 5. The results of our study indicate that corresponding age-specific incidences are shown in definitely higher than that reported in other studies, Izumo City the incidence at ages >50 years was of 50-69 years but declined slightly after the age of 70 the incidence of aneurysmal SAH increased almost is considerably lower than the actual incidence.

The number of patients in various age groups and the corresponding age-specific incidences are shown in Tables 1 and 5. The results of our study indicate that the incidence of aneurysmal SAH increased almost linearly with age and reached its maximum at the age of 50–69 years but declined slightly after the age of 70 years. Most other studies have reported the maximum incidence at the age of 50–69 years. However, for Izumo City the incidence at ages ≥50 years was definitely higher than that reported in other studies, suggesting that the higher total annual incidence for Izumo City is primarily due to the elevated rate suggesting that the higher total annual incidence for Izumo City is considerably lower than the actual incidence. It is expected that the greater the accuracy with which elderly patients are diagnosed, the higher the incidence rate will be, particularly in a small community such as Izumo City.

In our study, the annual incidence by sex for Izumo City was higher in men, whereas others have reported the incidence to be higher in women, with no consistent trend observed by sex. As for a sex difference by age group, in all studies except ours, it has been reported that the incidence of SAH is higher in women older than age 70 years. However, in all these studies the proportion of SAH patients over the age of 70 years is small, making evaluation difficult; thus, further inquiry into sex difference is indicated.

Studies have rarely been made of the incidence of SAH due only to rupture of aneurysms, and the rate should be more accurately examined in the future with refined techniques, such as CT scan. As the incidence of aneurysmal SAH increases with age, it is expected that the greater the accuracy with which elderly patients are diagnosed, the higher the incidence rate will be, particularly in a small community such as Izumo City.

<table>
<thead>
<tr>
<th>Study</th>
<th>Study years</th>
<th>Population</th>
<th>Age (years)</th>
<th>Annual incidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oslo, Norway</td>
<td>1950–1954</td>
<td>400,000</td>
<td>All ages</td>
<td>6.5</td>
</tr>
<tr>
<td>Carlisle, England</td>
<td>1955–1961</td>
<td>69,400</td>
<td>All ages</td>
<td>10.9</td>
</tr>
<tr>
<td>Helsinki, Finland</td>
<td>1954–1961</td>
<td>439,751</td>
<td>All ages</td>
<td>15.7</td>
</tr>
<tr>
<td>Iceland</td>
<td>1958–1968</td>
<td>185,505</td>
<td>All ages</td>
<td>8.0</td>
</tr>
<tr>
<td>Espoo-Kauniainen, Finland</td>
<td>1972–1973</td>
<td>113,100</td>
<td>All ages</td>
<td>19.5</td>
</tr>
<tr>
<td>Rochester, Minnesota</td>
<td>1945–1974</td>
<td>All ages</td>
<td>11.6*</td>
<td></td>
</tr>
<tr>
<td>Shibata, Japan</td>
<td>1976–1978</td>
<td>75,168</td>
<td>≥20</td>
<td>20</td>
</tr>
<tr>
<td>Middle Finland</td>
<td>1976–1978</td>
<td>241,000</td>
<td>All ages</td>
<td>19.4</td>
</tr>
<tr>
<td>Melbourne, Australia</td>
<td>1978–1979</td>
<td>160,000</td>
<td>≥35</td>
<td>26.4</td>
</tr>
<tr>
<td>Faroes, Denmark</td>
<td>1962–1975</td>
<td>38,523</td>
<td>All ages</td>
<td>7.4</td>
</tr>
<tr>
<td>South Alabama</td>
<td>1980</td>
<td>103,358</td>
<td>≥20</td>
<td>15.9</td>
</tr>
<tr>
<td>Kuopio, Finland</td>
<td>1978–1980</td>
<td>95,420</td>
<td>All ages</td>
<td>15</td>
</tr>
</tbody>
</table>

*Age-adjusted rates.

References

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