Solitary Deaths in the Tokyo Metropolis and Labor Force Status: Characteristics of Unnatural Deaths at Home among Persons Living Alone

Yoshimasa Kanawaku¹,² and Youkichi Ohno¹

¹Department of Legal Medicine, Nippon Medical School, Tokyo, Japan
²Tokyo Medical Examiner’s Office, Tokyo Metropolitan Government, Tokyo, Japan

Objective: To identify associations of solitary death with social determinants of health, namely, labor force status and welfare status, in Tokyo in 2015.

Methods: We obtained data on solitary deaths in 2015 in the 23 special wards of Tokyo and calculated the incidence rate and postmortem interval of solitary death in relation to sex, age, and labor force status.

Results: Data for 3,972 solitary deaths (2,785 males, 1,187 females) were analyzed. The non-employed rate was 79.3% among males and 89.5% among females. The incidence rate was significantly higher among non-employed persons than among employed persons in both sexes. Moreover, with the exception of women 65 years or older, the postmortem interval was significantly longer among non-employed persons than among employed persons in both sexes.

Conclusions: The incidence rates of solitary death were significantly higher among non-employed persons than among employed persons in both sexes, and the postmortem interval was significantly longer for non-employed persons. (J Nippon Med Sch 2019; 86: 360–363)

Key words: solitary death, unnatural death, medical examiner, labor force status

Introduction

Because single-person households are common and increasing in Japan¹, deaths at home of persons living alone, sometimes referred to as “solitary deaths,” are of considerable interest². The number of solitary deaths is expected to continue to increase; therefore, multiple government initiatives have been developed to address this social problem³. Although numerous studies have investigated the demographics of solitary deaths⁴,⁵, few have investigated the relationship between solitary death and social determinants of health, that is, the conditions in places where people live, learn, work, and play, which affect a wide range of health risks and outcomes⁶.

To augment basic social epidemiological data on solitary death, we investigated the characteristics of solitary deaths in Tokyo wards in 2015 in relation to social determinants of health, namely, labor force status and welfare status.

Methods

Solitary death was defined as an unnatural death at the home of a person living alone in a private household. Solitary deaths are by definition not witnessed and are therefore classified as unnatural. The Tokyo Medical Examiner’s Office (TMEO) is responsible for investigating all unnatural deaths that occur in the 23 wards of Tokyo and therefore must investigate all solitary deaths in that jurisdiction. We used the TMEO database of unnatural deaths to investigate solitary deaths in the special wards of the Tokyo metropolis. Using prespecified exclusion criteria (see Fig. 1A), we selected the decedents included in the analyses.

Because few solitary deaths were classified as suicide, accidental death, or criminal death, those cases were excluded. Thus, the present decedents comprised deaths due to disease, mainly sudden cardiac death. The number and incidence rate (number of cases per 1,000 single-
Results and Discussion

Table 1 shows the numbers of solitary deaths, by sex, age, and labor force status.

Among solitary deaths, 2,785 were male and 1,187 were female. The non-employed rate was 79.3% (2,209/2,785) among males and 89.5% (1,062/1,187) among females. Incidences by sex, age, and labor force status are shown in Figure 1B.

With the exception of males aged 15–24 years and 25–34 years and women 85 years or older, incidence was significantly higher among non-employed persons than among employed persons in both sexes. Figure 2A shows box plots of postmortem intervals, by sex, age, and labor force status.

With the exception of women 65 years or older, the postmortem interval was significantly longer for non-employed persons than for employed persons in both sexes. In addition, the median postmortem interval was 1 to 5 days longer for non-employed persons than for employed persons.
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Table 1 Numbers of solitary deaths, by sex, age, and labor force status

<table>
<thead>
<tr>
<th>Age</th>
<th>Non-employed</th>
<th>Employed</th>
<th>Non-employed</th>
<th>Employed</th>
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</thead>
<tbody>
<tr>
<td>15-24 y</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>25-34 y</td>
<td>9</td>
<td>17</td>
<td>1</td>
<td>4</td>
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<tr>
<td>35-44 y</td>
<td>55</td>
<td>58</td>
<td>5</td>
<td>7</td>
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<tr>
<td>45-54 y</td>
<td>144</td>
<td>106</td>
<td>43</td>
<td>13</td>
</tr>
<tr>
<td>55-64 y</td>
<td>401</td>
<td>179</td>
<td>65</td>
<td>24</td>
</tr>
<tr>
<td>65-74 y</td>
<td>834</td>
<td>159</td>
<td>182</td>
<td>24</td>
</tr>
<tr>
<td>75-84 y</td>
<td>579</td>
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<tr>
<td>≥85 y</td>
<td>185</td>
<td>13</td>
<td>322</td>
<td>14</td>
</tr>
<tr>
<td>Total</td>
<td>2,209</td>
<td>576</td>
<td>1,062</td>
<td>125</td>
</tr>
</tbody>
</table>

Figure 2B shows the percentages of welfare recipients among solitary deaths in non-employed persons, in relation to sex and age.

In males and females, about half of persons aged 35-64 years were welfare recipients. The percentage of welfare recipients decreased with age among males and females. Additionally, statistical significance of the differences of percentage of men to women was observed in those adults 65 years or older.

The incidence rates of solitary death were significantly higher among non-employed persons than among employed persons in both sexes (with the exception of the youngest decedents and women 85 years or older) and the median postmortem interval was significantly longer, with the exception of women 65 years or older. In particular, the high rate of solitary death among non-employed persons and persons younger than 65 years is noteworthy. The reason for the difference in the rates for employed and non-employed persons is unclear; however, our results suggest that further investigation of the labor force status of solitary death cases is warranted.

The postmortem interval differed in relation to labor
force status. Among non-employed persons, the median postmortem interval was 3-8 days, but some deaths were discovered after longer than 100 days. Such cases suggest an extreme lack of social interaction. Another interesting finding was that the rate of welfare receipt was significantly lower among women older than 65 years. A previous study reported that self-rated health was low among welfare recipients and that long-term welfare recipients were less likely to participate in health evaluations. These findings might help explain the solitary death rate among welfare recipients.

In conclusion, we observed an association between solitary death and labor force status. To identify any cause-effect relationship between solitary death and labor force status, future research should investigate the high rate of solitary death and long postmortem interval among non-employed persons. We believe that the results of such studies could have implications for measures to prevent solitary death, especially among non-employed, middle-aged adults living alone.

Conflict of Interest: The authors report no conflicts of interest.

References

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