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Cancer and Other Causes of Death among Koreans in Fukuoka, Japan, 1976–1986

Shiro Shinohara,[1,4] Suminori Kono,[2] Yoon-Ok Ahn[3] and Takao Shigematsu[2]

[1]*Fukuoka Environmental Research Center, 39, Mukaisano, Dazaifu 818-01,* [2]*Department of Public Health, School of Medicine, Fukuoka University, Nakakuma, Jonan-ku, Fukuoka 814-01 and* [3]*Department of Preventive Medicine, College of Medicine, Seoul National University, Seoul 110-470, Korea*

Mortalities from cancer and other causes among Koreans living in Fukuoka, Japan, between 1976 and 1986 were examined as compared with those of Japanese in the prefecture. Korean males had a marked excess in all-cause mortality, while the excess among females was less prominent. In both sexes, mortalities from liver cancer, liver cirrhosis, accident and suicide were markedly increased in the Korean population. These findings are in agreement with those observed among Koreans in Osaka. Although 20–30% lower-than-Japanese mortality from stomach cancer has been reported for Koreans in Osaka, those in Fukuoka had a risk of this cancer comparable to that of Japanese. A life-style survey of Koreans in Japan might provide a better understanding of the disease patterns observed in this population.

Key words: Koreans in Japan — Mortality — Liver cancer — Fukuoka

Comparison of disease patterns among different ethnic groups within a country provides useful information in the study of disease etiology. Japan is generally believed to be a nation of single ethnicity, but there are different populations of foreign nationality in this country although such populations are small. Among these, the Korean population is the largest one with nearly six hundred thousand inhabitants.[1)]

Several studies have analyzed mortality among Koreans in Japan, showing unique mortality patterns in this population. It has been reported that mortalities from liver cancer and liver cirrhosis are much increased in the Korean population as compared with Japanese.[2–6)] However, most of these studies are based on the national data.[2–4)] Bacause cause-specific mortality in Japan shows a marked regional or prefectural difference,[7)] comparison at the national level may be confounded by regional variation. Mortality analysis of Koreans within a prefecture has been limited to Koreans in Osaka, where more than a quarter of the Koreans in Japan live.[5,6)] It is important to examine whether similar patterns of cancer mortality are observed among Koreans living in different areas of Japan. This paper describes mortalities from cancer and other causes in the Korean population in Fukuoka Prefecture during the period from 1976 to 1986.

MATERIALS AND METHODS

Mortality and census data for Koreans and Japanese in Fukuoka Prefecture were utilized in the present study. Death certificate files for the period from 1976 to 1986 were obtained on a magnetic tape from the Ministry of Health and Welfare, Japan. Information was available for nationality, sex, age at death, year of death, and a four-digit code indicating the underlying cause of death. The underlying cause of death is coded in accordance with the 8th revision of the International Classification of Diseases (ICD) until 1978 and the 9th revision thereafter. In the present study, the 9th revision was used, and causes of death were selected so as to preserve comparability between the 8th and 9th revisions of ICD.

Mortalities from selected causes among Koreans were compared with those of Japanese by using standardized mortality ratio (SMR), because numbers of deaths were small for some causes of death. Comparison of age-specific death rates was done only for all-cause mortality. Analysis was first done separately for the two periods, 1976–80 and 1981–86, but the differences in mortality patterns between the two periods were small. Thus the results are presented combining the two periods to minimize random fluctuation. Population at risk of Koreans and that of Japanese for 1976–80 and 1981–86 were estimated from census populations in 1975 and 1980 and those in 1980 and 1985, respectively.[1)] Census populations for Koreans and Japanese in 1980 by age group are shown in Table I. The population of those aged 65 years or more was much lower in the Korean population.

Age-specific death rates by five-year class for Japanese were first calculated and then applied to population at risk of Koreans to obtain expected numbers of deaths in the Korean population. SMR is the ratio of observed deaths to the expected multiplied by 100. Ninety-five percent confidence interval (95% CI) of SMR was ob-

[4] To whom correspondence should be addressed.

Table I. Census Populations of Koreans and Japanese in Fukuoka by Age Group in 1980[a]

Age class (yr)	Koreans		Japanese (in thousands)	
	Male	Female	Male	Female
0–14	3330 (28)	3230 (29)	539 (25)	511 (22)
15–64	7687 (66)	7206 (65)	1482 (67)	1591 (68)
65–	700 (6)	658 (6)	179 (8)	251 (11)
Total	11717	11094	2200	2353

a) Figures in parentheses are percentages.

tained by referring to the tabular values of 95% CI factors for estimates of a Poisson-distributed variable by Haenszel *et al.*[8]

RESULTS

Regarding all-cause mortality, as shown in Fig. 1, Korean males had higher death rates than Japanese men throughout all the age groups, but the excess was not marked among Korean females.

Table II summarizes mortalities from selected causes among Koreans as compared with Japanese. In both sexes of Koreans, a prominent excess mortality was observed for diabetes mellitus, liver cirrhosis, accident and suicide. Mortality from all cancers among Koreans was higher than that of Japanese, and the excess was more marked in males than in females. Likewise, an unfavorable pattern was generally noted for mortalities from other causes among Korean males.

Table III shows cancer mortality by selected site among Koreans. Liver cancer was the most common cause of cancer deaths among Koreans, and excess mortality from this cancer compared with the rates of Japanese was notable in both males and females. Mortality from lung cancer was also increased among Koreans, while deaths from stomach cancer were comparable to those expected from the Japanese rates. Table IV presents SMRs by age group for cancers of the stomach, liver and lung as well as of all sites. Although some fluctuation was noted for cancers of the stomach and lung, the excess in mortality from liver cancer varied little with age groups.

DISCUSSION

A major problem of this type of mortality study is derived from the use of two unlinked souces of data.

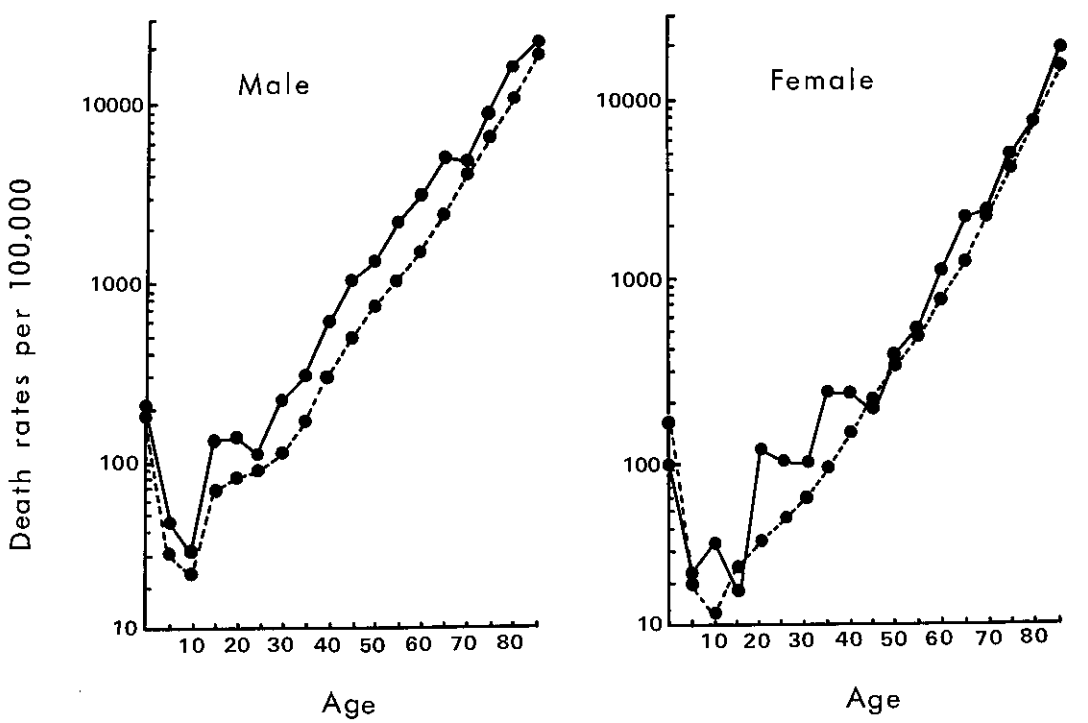

Fig. 1. Age-specific death rates of all causes for Koreans (straight line) and Japanese (dotted line) in Fukuoka, Japan, 1976–86.

Table II. Mortalities from Selected Causes among Koreans in Fukuoka, 1976–86[a]

Cause of death	9th ICD	Observed deaths		SMR (95% CI)	
		Male	Female	Male	Female
All causes		1205	490	170 (160–180)	127 (116–139)
Tuberculosis	010–018	21	2	200 (124–307)	73 (116–139)
All cancers	140–208	332	128	162 (145–180)	123 (103–147)
Diabetes mellitus	250	30	11	344 (232–492)	203 (102–364)
Heart diseases	393–398, 410–429	140	84	137 (116–162)	133 (106–165)
Ischemic heart disease	410–414	50	29	118 (88–157)	120 (80–173)
Heart failure	428	78	46	160 (127–201)	152 (113–205)
Stroke	430–438	185	85	164 (141–190)	120 (96–149)
Pneumonia and bronchitis	466.0, 480–491	65	17	194 (151–248)	97 (57–156)
Liver cirrhosis	571	97	17	282 (230–346)	206 (120–329)
Accident	E800–949	89	23	194 (157–240)	175 (111–263)
Suicide	E950–959	63	24	210 (163–271)	203 (130–303)

a) Compared with mortality of Japanese in Fukuoka, 1976–86.

Table III. Cancer Mortality by Selected Site among Koreans in Fukuoka, 1976–86[a]

Site of cancer	9th ICD	Observed deaths		SMR (95% CI)	
		Male	Female	Male	Female
Esophagus	150	11	2	138 (69–248)	158 (19–571)
Stomach	151	69	28	121 (95–154)	107 (71–155)
Colorectum	153–154	24	4	146 (94–218)	39 (11–99)
Liver	155	120	21	338 (282–406)	237 (146–362)
Pancreas	157	9	10	92 (42–175)	190 (91–350)
Lung	162	64	15	180 (140–232)	152 (85–250)
Uterine	179–182	—	13	—	145 (77–248)

a) Compared with mortality of Japanese in Fukuoka, 1976–86.

Table IV. Cancer Mortality by Age-group for Selected Sites among Koreans in Fukuoka, 1976–86[a]

Site of cancer	Age (yr)	Observed deaths		SMR (95% CI)	
		Male	Female	Male	Female
All sites	<50	36	23	159 (113–223)	116 (73–174)
	50–64	139	33	177 (150–210)	98 (69–139)
	$\geqslant 65$	157	72	151 (129–177)	142 (112–180)
Stomach	<50	14	6	254 (139–427)	112 (41–244)
	50–64	17	4	78 (46–126)	52 (14–132)
	$\geqslant 65$	38	18	127 (91–176)	139 (82–220)
Liver	<50	12	2	290 (150–507)	267 (32–963)
	50–64	70	8	392 (307–498)	258 (111–508)
	$\geqslant 65$	38	11	282 (202–391)	219 (109–391)
Lung	<50	2	0	112 (14–403)	0[b] (0–380)
	50–64	16	6	138 (79–224)	208 (76–454)
	$\geqslant 65$	46	9	207 (153–278)	148 (68–282)

a) Compared with mortality of Japanese in Fukuoka, 1976–86.
b) The expected value was 0.97.

Koreans enumerated in the census are those of Korean nationality with a minimum of three months' residence or intending to stay for at least three months, while deaths among them are registered regardless of residence period or qualification. If between-country movement of the population is large, bias would be substantial. The majority of Koreans living in Japan are, however, those who immigrated up to the 1940's and their offspring. In Fukuoka, 96% of Koreans are those having the right of permanent residence.[9]

It would be more informative if cancer patterns of Koreans in Japan were compared with those in Korea. Koreans living in Japan mostly originate from South Korea, but there are no comparable data in the Republic of Korea. No more than 35% of registered deaths are certified by physicians,[10] and cancer registry in Korea is hospital-based with unknown completeness of reporting.[11] Further, cancer mortality cannot be examined separately for Koreans born in Japan and for those in Korea, because information on birth place is not available in either vital statistics or census data. Nevertheless, possible difference in the cancer pattern between Japanese-born and Korean-born Koreans could be evaluated by SMRs according to the age groups. Since the immigration of Koreans had mostly occurred before the early 1940's, the majority of old Koreans (i.e. those aged 65 years or more) living in Japan could be regarded as the first generation. Data in Table IV suggest that at least mortality from liver cancer does not differ much between the immigrants and their offspring.

Mortality patterns observed among Koreans in Fukuoka are generally in agreement with those of Koreans observed in Osaka as well as in the whole of Japan.[2-6] Thus, the present study consolidated excess mortalities from liver cancer, liver cirrhosis, accident and suicide in the Korean population. Of particular interest is the finding that mortalities from liver cancer and liver cirrhosis among Koreans in Fukuoka were increased to the same extent as reported in Osaka.[5,6] Comparison at the national level found a much larger excess of mortalities from these diseases among Korean males.[3,4] Because prefectural variations in mortalities from liver diseases are positively correlated with the size of Korean population, the magnitude of excess estimated at the prefectural level would be more reliable. Rank correlations between age-adjusted death rates in males in 1985 and the ratios of Korean to Japanese population in the 47 prefectures in the same year, were 0.34 (P=0.03) for liver cancer and 0.28 (P=0.06) for liver cirrhosis.

Hepatitis B virus infection and alcohol consumption have been implicated as being causally linked with liver cancer and liver cirrhosis.[12] It seems that hepatitis B virus carriers are more frequent among Koreans than among Japanese but less so compared with Koreans in the home country. A survey of blood donors in Osaka reported that positive rates of hepatitis B virus surface antigen were 7.6% and 3.2% in Korean males and females, respectively, while the positive rates in the whole series of blood donors were 2.2% and 1.6% in males and females, respectively.[13] In a study of adult Koreans in Seoul, the positive rates were estimated as 11.7% in males and 9.5% in females.[14] These figures indicate that the excess risk of liver diseases among Koreans in Japan is partly attributed to the higher prevalence of hepatitis B virus carriers. It has been conjectured that alcohol problems may be more frequent in the Korean population in Japan in view of their difficult socioeconomic situation.[2,6] The increased mortalities from accident and suicide among Koreans in Japan may be in line with this idea, but the few studies of drinking habits of Koreans in Japan are disparate in their findings. One study in Osaka noted that alcohol consumption tended to be larger among Koreans than among Japanese, particularly in males,[15] but another study, again in Osaka, found no difference in drinking habits between Koreans and Japanese.[13]

In Osaka, Koreans had 20–30% lower mortality from stomach cancer as compared with Japanese, and it was noted that stomach cancer mortality had declined more rapidly in the Korean population.[6] The present study did not evidently demonstrate a decrease in mortality from this cancer among Koreans, although the SMRs fluctuated somewhat with age groups. The inverse relation between stomach cancer and socioeconomic status is a worldwide phenomenon,[16] so the mortality from stomach cancer among Koreans, whether lower than or equal to the risk of Japanese, is puzzling because the Korean population in Japan is generally considered to be at lower socioeconomic levels.

In conclusion, Koreans in Japan are undoubtedly at high risk of liver cancer and liver cirrhosis. Studies on life styles of Koreans in Japan are required to clarify the reasons for the unique disease patterns observed in this population. Comparable mortality and morbidity data in Korea are also needed.

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