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Mortality of major health problems in North Korean refugees

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ABSTRACT

Background: *This study aims to report the health level for the latest North Korean refugees (NKRs) by comparing the age-adjusted death rate of NKRs and South Korean population (SKP) from cancer, cardiovascular disease (CVD) and suicide.*

Methods: *This study data used the Korean national health insurance service database for research and statistics and Korean death cause cumulative database. The population of the study were 22,351 NKRs and SKP adults aged 20 or older 2003-2018. Death rate per 1000 or 100000 person-years of all-cause, cancer, CVD and suicide were estimated in NKRs. In addition, the sex and age specific death rates of NKRs and SKP, sex and age-standardized death rate were estimated and compared.*

Results: *The death rate per 100000 people person-years (PYs), NKRs was 219 in all-causes, 70 per 100000 PYs in cancer, 36 per 100000 PYs in CVD, and 24 per 100000 PYs in suicide. Age-adjusted death rate per 100000 comparisons were NKR 273.2 and SKP 668.0 in all-cause, NKR 95.9 and SKP 185.4 in cancer, NKR 44.5 and SKP 150.6 in CVD, and NKR 10.3 and SKP 33.7 in suicide.*

Conclusion: *This result showed that SKP had a high mortality of cancer, CVD and suicide than SKP. However, the mortality rate of men in NKR was higher than that of women, and in particular, the mortality rate of men from cancer was higher than that of SKP. Therefore, health promotion and redesign of health plans are necessary to reduce the early death of NKRs.*

KEY WORDS: North Korean refugees, South Korean population, cancer, cardiovascular disease

1. Introduction

Background

According to the Ministry of Unification, the number of North Korean refugees who settled in South Korea in December 2020 is known to be 33752. The Korean government has been investigating the survey of North Korean refugees every year since 2011, but reports of North Korean refugee's health level, disease, and trends were insufficient. Although there were reports of subjective health of North Korean refugees in 2016, but it was limited health result. In the past, North Korean refugee's health problems were high in musculoskeletal diseases, digestive system disease, tuberculosis, and hepatitis-related diseases. In one North Korean refugee's study, as North Korean refugees settled in South Korea for a long time, the utilization of health care due to mental illness, endocrine disease, and circulatory disease increased.

The latest study reported the burden of disease of North Korean refugees. North Korean refugees YLL due to liver cancer, lung caner, ischemic heart disease, ischemic stroke, and self-harm was

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high, while YLD was ranked high in diabetes mellitus and mental illness. Cancer, cardiovascular disease, and suicide are important public health issues both now and in the future. In particular, the North Korean refugees, immigrants, residents, and multicultural races are vulnerable to public health and have high risk of health loss. Therefore, we need to estimate the mortality rate through a comparative group, focusing on the main causes of death dealt with by North Korean refugees in the burden of disease.

Previous studies reported the death rate of North Korean refugees, but previous study were North Korean refugees living in China and had limitations on the method of estimating epidemiology. And there were no control group comparing the health indicators of North Korean refugees. Research on North Korean refugees is gradually increasing, but most of the previous studies have common limitations of small samples and case and cross-sectional study. And, stockholders and scholars are increasingly interested in the health risk of North Korean refugees, but the results of health indicator that can be compared to South Korean population are insufficient.

Aims

The purpose of the study is to report the mortality rate of major non-infectious disease of North Korean refugees using Korean national health insurance big data. Therefore, the mortality of cancer and cardiovascular disease of North Korean refugees are reported, and the health level of North Korean refugees is reported through comparison with the South Korean population.

2. Methodology

Research Materials

The NKR's data is a longitudinal study design linked to Korean Statistical Information on the cause of death of NHIS (National Health Insurance Service) research data base and KSIS (Korea Statistical Information Service) data. NKR's data were 37,528 people who qualified for NHIS from 2002 to 2018. In the initial data, 5,124 people included in several exclusion criteria were excluded from the subject, and 32,404 people were selected as study subjects. Among them, the analysis of cancer and cardiovascular disease mortality was analyzed by NKR 22,351 over the age of 20. Age-standardization mortality was estimated ASMR (age-standardized mortality rate), and SMR (standardized mortality ratio) per 100,000 persons.

Data Collection

We referred to previous studies on code definitions for cancer, cardiovascular diseases, and suicide. The diagnosis code was defined as patients diagnosed with cancer (C00-C97), cardiovascular disease (I00-I99), and suicide (X60-X80) as the ICD-10.

The national cancer death database of the National Cancer Center Register was used to estimate cancer mortality among South Korean. For deaths from cancer, adults classified as death code C00-C97 were selected for the study. In addition, in statistics on the cause of death of the National Statistical Office, all death codes were used, and adults classified as I00-I97 were selected as subjects of the stud as deaths codes due to circulatory systems. Base on the calculate data, the morbidity of age standardization rate and age standardization mortality rate were calculated, and the standardization ratio of cancer and cardiovascular diseases of North Korean refugees and South Korean population was also calculated. The morbidity and mortality of North Korean refugees and South Korean population at the time of 2018 were compared, and the age standardization rate was calculated using the estimated population in 2018.

3. Results

Proportion of North Korean refugees

There were 22,351 adults of North Korean refugees. Among the North Korean refugees, 78.07% were women, and the average age of entry into South Korea was 36.93. In health insurance coverage, 92.88% of medical aid were covered. And the average length of stay in South Korea was 7.50 years. The proportion of health status of North Korean refugees was 20.62% with hypertension, 25.07% with diabetes mellitus, and 44.12% with hyperlipidemia. Chronic heart disease accounted for 14.14%, 49.64% with chronic lung disease, 45.32% with chronic liver disease, 15.58% with chronic kidney disease and 16.83% with chronic neurological disease. (Table 1).

The morbidity rate and mortality rate of major disease among North Korean refugees

The morbidity rate for sex per 1000 person-years was 591 for cancer in male and female, respectively. Cardio-cerebrovascular disease was 6552 in male and 7800 in female, with a sex ratio of 0.84. And heart disease was 1651 in male and 1815 in female with a sex ratio of 0.91, and cerebrovascular disease was 1036 in male and 1075 in female with a sex ratio of 0.96. The mortality rate for sex per 100000 person-years was 563 in male and 123 in female with a sex ratio of 4.58. Cancer was 168 in male and 43 in female with a sex ratio of 3.91. And circulatory disease was 84 in male and 22 in female with a sex ratio of 3.82, and suicide was 63 in male and 13 in female with a sex ratio of 4.85 (Table 2).

Comparison of age-standardized mortality rate of North Korean refugees and South Korean population.

In the comparison of crude mortality between NKR and SKP, all-cause was 1.46 for NKR and 0.68 for SKP, which was 2.15 times higher for NKR. However, in the ASMR results, NKR was 56.01 and SKP was 6.84, which was 8.24 times higher in NKR.

4. Discussion

North Korean refugees and South Korean population live in South Korea, but they are groups with different epidemiological characteristics. The demographic characteristics of North Korean refugees were predominant in the distribution of women and young. And 92.9% of the North Korean refugees were medical aid, and most of them lived in South Korea for less than 10 years. Therefore, we applied age-standardization to compare the death indicators of cancer, cardiovascular disease and suicide among North Korean refugees and South Korean population.

The death rate of North Korean refugees and South Korean population increased as the age increased. And death rates in their 60s and 70s have increased dramatically. Men and women mortality rate for all causes, cancer, CVDs, and suicide of North Korean refugees was lower than that of South Korean population. However, the death rate of North Korean refugees differed by sex. The death rate of North Korean refugees was higher in men than in women, but the death rate for cardiovascular disease was higher in women. North Korean refugees had a higher mortality rate than South Korean population, but the men cancer mortality rate of North Korean refugees was higher than that of women and was similar to that of South Korean men. South Korean non-profit organizations reported a high suicide rate among North Korean refugees, but this study found that the rate was lower than that of South Korean population. However, considering the number of North Korean refugees living in South Korea, the death rate is not low.

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The first of the reasons for the high mortality of cancer and cardiovascular diseases among North Korean refugees is the change in lifestyle through settlement in South Korea. A recent study reported showed changes in diseases related to everyday patterns as North Korean refugees settled in South Korean lifestyle. And another study reported an increase in metabolic diseases of North Korean refugees. The cause of metabolic disease is influenced by changes in diet and lifestyle. In a study of refugees, the risk of metabolic disease such as high blood pressure, diabetes, and obesity increased after settlement. The intervention of North Korean refuses lifestyle should focus on groups with low recognition of health or lack of exercise in the early days of settlement in South Korea. In addition, the metabolism and NCD promotion of North Korean refugees should be provided separately from individual and population group management.

The second reason can be considered over-estimation. This is that many North Korean refugees were first diagnosed with cancer and cardiovascular disease through national health screening program and medical utilization after entering South Korea. And North Koreans' disease trends are changing. Recently the World Health Organization (WHO) estimated that cardiovascular disease accounted for 40% and cancer 19% of North Korea's mortality rate in 2018, and that non-communicable diseases accounted for 87% of the total mortality rate [1]. Among the many diseases that North Korean refugees, cancer and cardiovascular disease are important because the cause of death has increased in the NCD mortality rate of the North Korean population. However, in a study on the perception and experience of non-communicable in North Korea, North Korean adults reported that the prevalence of stroke and heart disease is increasing but understanding and knowledge of non-communicable are not high [3]. This may be because North Korean refugees had low health behavior due to their understanding and prevention of cancer and cardiovascular diseases. Recently, various intervention studies of North Korean refugees have been attempted. And some North Korean refugee's intervention studies had significant health effects. Health behavior through preventive education can change. Therefore, an intensive prevention and arbitration strategy for North Korean refugees is needed.

North Korean refugees have the same language as Koreans, but have different environmental backgrounds from ordinary Koreans, such as birth and growth backgrounds, social and health systems, perceptions, and North Korean related episodes. However, previous studies have shown that the prevalence of metabolic disease increases as the period of residence of North Korean refugees in South Korea [5]. Therefore, the increase in metabolic disease of North Korean refugees can be seen because of health according to lifestyle and health behavior after setting in South Korea. The burden of disease on North Korean refugees mentioned mental health problems of North Korean refugees. North Korean refugees are likely to experience trauma in their defection and stay, so fear persists while living in South Korea.

Suicide of North Korean defectors has problems such as adaptation to life in South Korea, negative life events, concerns about families in North Korea and China, and loneliness. Mental disorders occur or worsen due to interpersonal relationships and stress of North Korean defectors. Suicide is also a major health problem in Korea. Since there is social support as a protection factor, it is necessary to link social resources to prevent North Korean defectors from being isolated. However, instead of clinically approaching the health consequences of North Korean defectors such as cancer, cardiovascular disease, and suicide, an approach to health care for North Korean defectors is needed from an integrated perspective.

Research reports on North Korean refugees are increasing every year. However, there are common limitations in previous studies on North Korean refugees. Most of the previous studies showed cross-sectional studies and small-size North Koran refugees were surveyed. Population groups sensitive to personal information disclosure, such as North Korean refugees, are unlikely to succeed in follow-up studies due to their difficulty in follow-up and censoring. The advantage of this study is that it is possible to generalize North Korean refugees and retrospective study design, which were the limitations of previous studies.

North Korean refugees are exposed to dangerous environments after escaping from North Korea. During their stay in a third country, North Korean refugees experience poverty, increased infectious diseases, malnutrition, and trauma. We can help determine the distribution of health promotion and medical resources by estimating the causes of disease and death of North Korean refugees. And this study was able to report the health status of North Korean refugees through comparison with South Korean population.

5. Conclusion

Cancer and cardiovascular disease prevalence are highly related to chronic diseases. And cancer and cardiovascular disease are known to be the primary causes of death in South Korea. We need to manage chronic diseases to reduce the incidence and death of NKRs due to cancer and cardiovascular disease. Chronic disease management is important in that it is delicate and complex, but prevention is possible. The burden of disease on cancer and cardiovascular disease is responsible for lifestyle or health behavior such as smoking, obesity, alcohol consumption, and overweight. In this study, North Korean refugees had a higher prevalence of cancer and cardiovascular disease and a higher mortality rate and the South Korean population. It is impossible to trach whether the incidence of cancer and cardiovascular disease among North Korean refugees is before and after North Korea's defector, but intensive health care of North Korean refugees is needed.

Reference

1. Organization WH. Noncommunicable diseases country profiles 2018. 2018.
2. Lee YH, Yoon S-J, Kim YA, Yeom JW, Oh I-HJJoPM, Health P. Overview of the burden of diseases in North Korea. 2013;46(3):111.
3. Choi H, Ha SJNjocp. The perceptions and experiences of North Korean refugee doctors concerning the burden of non-communicable diseases in North Korea. 2019;22(7):913.
4. Yo-Han L. A comparative study on the health status between North Korean refugees and South Korean. Korea university; 2011.
5. Kim YJ, Lee YH, Lee YJ, et al. Prevalence of metabolic syndrome and its related factors among North Korean refugees in South Korea: a cross-sectional study. BMJ open 2016;6(6):e010849.
6. Lee SJ. Medical Utilizations and Occurrence of Disease between North Korean Defectors and South Koreans. Department of Epidemiology & Health Informatics: Korea University; 2020.

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Table 1. General characteristics of North Korean Refugees

Variable	Classification	N or mean N=22351	% or standard deviation
Sex	Male	4,901	21.9
	Female	17,450	78.1
Age of entry into South Korea (year)		36.9	11.7
Type insurance	National health insurance	1,592	7.1
	Medical aid	20,759	92.9
Length of stay in South Korea (year)		7.5	4.0
	≤1	1923	8.6
	2–4	3818	17.1
	5–9	9082	40.6
	≥10	7528	33.7

Table 2. Sex and age specific death rates per 100000 person-years for all-cause, cancer, CVD, and suicide in NKRs, 2003−2018

	All−cause		Cancer		CVD		Suicide	
	No of deaths (%)	Death rate per 100,000 person−years	No of deaths (%)	Death rate per 100,000 person−years	No of deaths (%)	Death rate per 100,000 person−years	No of deaths (%)	Death rate per 100,000 person−years
All	412 (100.0)	219	128 (100.0)	70	54 (100.0)	36	45 (100.0)	24
Sex								
Men	232 (56.3)	563	67 (52.3)	168	28 (51.9)	84	26 (57.8)	0.63
Women	180 (43.7)	123	61 (47.7)	43	26 (48.1)	22	19 (42.2)	0.13
Age								
20−29	46 (11.2)	81	5 (3.9)	9	2 (3.7)	4	18 (40.0)	32
30−39	91 (22.1)	137	23 (18.0)	36	5 (9.3)	10	12 (26.7)	18
40−49	107 (26.0)	260	39 (30.5)	99	11 (20.4)	35	10 (22.2)	24
50−59	45 (10.9)	359	19 (14.8)	158	5 (9.3)	53	3 (6.7)	24
60−69	67 (16.3)	823	29 (22.7)	378	14 (25.9)	237	1 (2.2)	12
70−79	47 (11.4)	1728	9 (7.0)	361	17 (31.5)	821	1 (2.2)	37
80+	9 (2.2)	8889	4 (3.1)	4459	0 (0.0)	0	0 (0.0)	0

Numbers of death/total person-yearsX100000

Table 3. Age-specific death rates per 1000 people for all−cause, cancer, CVD and suicide in NKRs and SKP, 2003−2018

	All−cause		Cancer		CVD		Suicide	
	NKRs	SKP	NKRs	SKP	NKRs	SKP	NKRs	SKP
Both sexes								
20−29	0.3	0.5	0.0	0.1	0.0	0.0	0.1	0.2
30−39	0.6	0.8	0.2	0.2	0.0	0.1	0.1	0.3
40−49	1.1	2.0	0.4	0.6	0.1	0.3	0.1	0.3
50−59	1.4	4.1	0.6	1.6	0.2	0.6	0.1	0.4
60−69	5.4	9.4	2.3	3.9	1.1	1.9	0.1	0.4

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70−79	10.6	26.6	2.0	8.8	3.8	6.7	0.2	0.7
80+	28.1	93.1	12.5	14.7	0.0	25.1	0.0	1.0
All ages	0.9	6.7	0.3	1.9	0.1	1.5	0.1	0.3
Men								
20−29	0.5	0.6	0.0	0.1	0.0	0.0	0.2	0.2
30−39	1.3	1.1	0.2	0.1	0.1	0.1	0.1	0.3
40−49	3.6	2.8	1.3	0.6	0.3	0.4	0.4	0.4
50−59	4.1	6.1	1.2	2.0	0.5	0.9	0.4	0.5
60−69	14.8	13.9	6.9	5.5	3.0	2.4	0.4	0.7
70−79	27.9	37.4	5.3	12.9	8.0	7.6	0.0	1.1
80+	62.5	113.3	31.3	23.4	0.0	24.6	0.0	1.8
All ages	2.2	7.4	0.6	2.2	0.3	1.4	0.2	0.5
Women								
20−29	0.2	0.4	0.0	0.0	0.0	0.0	0.1	0.2
30−39	0.4	0.6	0.1	0.2	0.0	0.0	0.1	0.2
40−49	0.5	1.1	0.2	0.5	0.1	0.1	0.0	0.2
50−59	0.4	2.1	0.4	1.0	0.0	0.3	0.0	0.2
60−69	3.2	5.4	1.3	2.2	0.7	1.2	0.0	0.2
70−79	7.1	19.1	1.4	5.2	3.0	5.7	0.3	0.4
80+	19.5	84.5	7.8	10.3	0.0	24.5	0.0	0.6
All ages	0.5	0.6	0.2	1.4	0.1	1.6	0.1	0.2

Abbreviation: CVD, Cardiovascular disease; NKRs, North Korean refugees; SKP, South Korean population

Table 4. Age−adjusted death rates per 100000 people in NKRs and SKP, 2003−2018

	Both sexes			Men			Women		
	NKR	SKP	Ratio*	NKR	SKP	Ratio*	NKR	SKP	Ratio*
All−cause	273.2	668.0	0.4	607.7	743.3	0.8	192.6	594.5	0.3
Cancer	95.9	185.4	0.5	210.3	220.4	1.0	67.4	136.6	0.5
CVD	44.5	150.6	0.3	95.8	135.5	0.7	33.7	156.4	0.2
Suicide	10.3	33.7	0.3	27.9	46.8	0.6	5.2	21.0	0.2

Abbreviation: NKR, North Korean refugee; SKP, South Korean population; CVD, Cardiovascular disease

*North Korean Refugees/South Korean Population

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