

Parasitic Diseases as the Cause of Death of Prisoners of War during the Korean War (1950-1953)

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Abstract: To determine the cause of death of prisoners of war during the Korean War (1950-1953), death certificates or medical records were analyzed. Out of 7,614 deaths, 5,013 (65.8%) were due to infectious diseases. Although dysentery and tuberculosis were the most common infectious diseases, parasitic diseases had caused 14 deaths: paragonimiasis in 5, malaria in 3, amoebiasis in 2, intestinal parasitosis in 2, ascariasis in 1, and schistosomiasis in 1. These results showed that paragonimiasis, malaria, and amoebiasis were the most fatal parasitic diseases during the early 1950s in the Korean Peninsula. Since schistosomiasis is not endemic to Korea, it is likely that the infected private soldier moved from China or Japan to Korea.

Key words: parasitic disease, cause of death, Korean War, paragonimiasis, malaria, amoebiasis

How many prisoners of wars (POWs) died due to parasitic diseases during the Korean War (1950-1953)? It was difficult to answer to this question previously because there were no records published before 1998; however, since the release of some data by the United States, it has become possible to answer to this question. Moreover, the information presented can be extrapolated to illustrate mortality from parasitic diseases in the Korean Peninsula during the early 1950s.

The causes of death of POWs during the Korean War have been described as follows: In 1998, the United States Department of Defense, through the United States National Archives and Records Administration, released new information about the prisoners. These data included records on 7,614 deaths of POWs during the Korean War including information records on the clinical diagnosis of disease and findings on each POW's death, the date of death as well as the rank, birth date, and birth place [1]. However, these records provided no information on gender and nationality of the POWs. Infectious diseases were the most common cause of deaths among POWs, i.e., 5,013 of 7,614 deaths (65.8%). The most common infectious diseases were dysentery and tuberculosis [1].

Among the 7,614 recorded deaths of POWs in Korea, deaths caused by parasitic diseases accounted for 14 (0.2%). Of the parasitic diseases, paragonimiasis (n=5) and malaria (n=3) were the most common causes of mortality; amoebiasis (n=2), intestinal parasitosis (n=2), ascariasis (n=1), and renal schistosomiasis (n=1) had caused the remaining deaths. The ages of subjects and corresponding causes of death are shown in Table 1. The majority of POWs died at the age of 30 years or younger. The data presented in this communication may be used to illustrate the cases of pathogenic parasitic diseases in early 1950s' in Korea.

Fatal paragonimiasis was typically an extrapulmonary infection that affected the brain and spinal cord and accounted for approximately 1% of all cases [2]. During the Korean War, there were no specific chemotherapeutic drugs for paragonimiasis, and pulmonary infection may cause a fatal lung condition in case of multiple infections. Mono-infection with *Plasmodium vivax* may cause a severe, life-threatening condition when complicated with jaundice, cerebral or pulmonary involvement, or renal failure [3]. A report from June 2011 to March 2012 in a tertiary care center in Kolkata, India had shown that the mortality rate of severe vivax malaria was 20% [3]. The fatality rate of invasive amoebiasis was reported as 29%. Postmortem examinations have established the causes of death as extensive colitis with deep ulcers and complications, including colonic perforation, peritonitis, pneumonia, and septicemia in Bangladesh [4]. Heavy infections with *Asca-*

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Table 1. Parasitic diseases as the cause of death of prisoners of war during the Korean War (1950-1953)

Age	Parasitic diseases as the cause of death
30	Amebic liver abscess (multiple)
30	Amebic colitis (minute perforations and acute peritonitis)
41	Ascariasis (regurgitation with suffocation)
Unknown	Intestinal parasitosis
Unknown	Intestinal parasitosis
18	Malaria
Unknown	Malaria
Unknown	Malaria
18	Paragonimiasis
21	Paragonimiasis
28	Paragonimiasis (pulmonary and cerebral)
29	Paragonimiasis (abdominal and pulmonary)
40	Paragonimiasis (bowel and peritoneal cavity)
20	Schistosomiasis (renal and fatty metamorphosis of the liver)

ris lumbricoides may require surgical abdomen due to intestinal obstruction and may result in fatality rates ranging from 0% to 8.6% (weighted mean, 5.7%), as found in 14 studies from 7 countries [5].

From these results, it is possible to note that some parasitic diseases result in fatality. Some data on parasitic diseases during the Korean War can be also obtained from participating countries' reports. Over 1,000 cases of malaria were reported in Canadian troops returning to Canada after serving in Korea, and therefore, the troops who stayed in Korea were prescribed 14 days of primaquine [6]. According to the colonial Japanese government, 99,711 patients were diagnosed with malaria, and 959 patients died due to malaria in 1938; corresponding prevalence and mortality rates of malaria likely persisted until the beginning of the Korean War [7].

Before and after the Korean War, the prevalence of ascariasis in South Korea was over 80% [8]. According to a coprological survey of 919 stool samples in 1948, the prevalence of parasitic diseases were as follows: *Ascaris lumbricoides* 82.4%, *Trichuris trichiura* 81.1%, hookworms 46.5%, *Trichostrongylus* sp. 3.6%, *Clonorchis sinensis* 7.1%, *Metagonimus yokogawai* 1.6%, *Enterobius vermicularis* by scotch tape anal swab 20.2%, *Entamoeba histolytica* 5%, *Entamoeba coli* 27.1%, *Endolimax nana* 8.3%, and *Giardia lamblia* 3.5%. From the same study during the same time, 457 blood samples were screened for parasites; 3.3% were positive for vivax malaria, and 2 of 35 blood specimens from the island of Jeju-do (5.7%) were positive for *Wuchereria malayi* (now *Brugia malayi*) [9].

With the United Nation (UN) retreat in the face of the Chi-

nese military intervention in the winter of 1950-1951, UN POW camps became severely overcrowded, sanitation in the camps was very poor, and the individual POW's hygiene deteriorated significantly, despite provisions of safe food and water by the United States-led United Nation Command [10]. Consequently, it was difficult to immediately diagnose and treat patients with infectious or parasitic diseases. Another interesting finding was mortality from renal schistosomiasis because schistosomiasis is not prevalent in Korea. Since the infected private soldier was 20 years old, he might have moved from China or Japan to Korea with his family after 15 August 1945, when independence from the Japanese Colonial Government was declared.

It can be concluded that severe or migrating parasitic diseases may be fatal in extreme conditions such as poor hygiene, malnutrition, extreme stress, cold weather, and other immunocompromised conditions in POWs during the Korean War. Although parasitic diseases such as malaria, paragonimiasis, amoebiasis, and ascariasis were endemic to Korea during the early 1950s, the diagnosis of parasitic diseases in POWs camp was likely to be difficult without mass screening efforts. Although the prevalence of parasitic diseases is high, few parasitic diseases have been reported to cause death.

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CONFLICT OF INTEREST

I have no conflict of interest related to this study.

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