Insight

Infectious Diseases Detected Among Immigrants in Kuwait

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ABSTRACT

The aim of this study was to detect the infectious diseases prevalent among immigrants and to control their spread in Kuwait. More than 200,000 immigrants come to Kuwait every year for residence or work, and the majority of them (75%) come from developing countries where infectious diseases are endemic. All the immigrants were checked for infectious diseases like, malaria, filaria, tuberculosis, HIV and hepatitis B and C before they were issued a residence permit. These tests were performed between 1991 and 1999. The screened population consisted of 921,012 for malaria and filaria; 1,645,052 for HIV; 326,246 for hepatitis B & C and 1,645,052 for tuberculosis. The total number of persons infected with all the five diseases was 11,545 (0.2%). About 1366 (0.15%) individuals were infected with malaria; 691 (0.08%) with filaria; 591 (0.04%) with HIV; 1194 (0.4%) with hepatitis B; 628 (0.2%) with hepatitis C and 7075 (0.4%) with tuberculosis. All the newly arrived immigrants infected with malaria were treated in the Infectious Diseases Hospital, Kuwait. Those with filaria, HIV, hepatitis B and C were deported to their country of origin because of the risk of transmission of these

KEYWORDS: filaria, hepatitis, human immunodeficiency virus, malaria, tuberculosis

INTRODUCTION

We are standing on the brink of a global crisis of infectious diseases. No country is safe from them and no country can any longer afford to ignore their threat. Nearly 50,000 men, women and children are dying every day from infectious diseases and many of them could be prevented or cured. In the last 20 years, at least 30 new infectious diseases have emerged that further threaten the health of hundreds of millions of people.

All the immigrants in Kuwait are checked for infectious diseases (malaria, filaria, tuberculosis, HIV and hepatitis B and C) at the Medical Center.

Malaria is a public health problem in some 100 countries worldwide, inhabited by over 2.2 billion people[1]. Every year, 350 to 500 million clinical cases of malaria are reported in the world and 90% of these are only from tropical Africa. The mortality due to malaria varies from 1.5 to 2.7 million worldwide every year. One million young children under the age of five years die every year (one child in every 30 seconds). About 120 million people in 76 countries throughout the tropical and subtropical areas of Asia, Africa, the Western Pacific, the Middle East, India, South East Asia and some parts of the Americas are infected with *Wuchereria bancrofti*, *Brugia malayi* or *Brugia timori*, and 40 per cent of the total filaria cases are found only in India[2].

Hepatitis B virus (HBV) is the major cause of the medical liver disease worldwide. About two billion people have been infected with this virus and more than 350 million have chronic infections. Disease associated with HBV infection not only gives rise to much human sufferings, but also places an intolerable burden on public health services, particularly in poor countries. Hepatitis C virus (HCV) is not as infectious as hepatitis B. However, 80% of infected people can become chronically infected and risk serious long term clinical sequelae including cirrhosis and hepatocellular carcinoma. According to a WHO survey 3% of the world population is infected with HCV and there are more than 170 million chronic carriers who are at risk of developing liver cirrhosis and/or liver cancer[3].

Tuberculosis is a disease of the poor and children between the age of 5-9 years living in slums. It is one of the biggest killers, and takes a big toll on AIDS victims. Recently, there has been an increasing number of people infected with drug-resistant strains of TB.

Acquired Immunodeficiency Syndrome (AIDS) is an infection caused by HIV (Human Immunodeficiency Virus) and the infected person may remain healthy for years[4-5]. The seroconversion takes place in infected individuals within six months of infection and anti-HIV

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antibodies appear later. The immune system of the patient becomes so weak that they contract secondary infections[6]. Presently, 42 million people are infected with HIV worldwide.

Our main aim was to control the spread of these infectious diseases in Kuwait. Therefore all the immigrants are checked for these infections before they are issued a residence permit.

MATERIAL AND METHODS

Blood Collection for malaria and microfilaria: Two thick blood films were made from a finger prick on the same slide from all immigrants to detect malaria parasites and microfilaria.

Thick blood film: Thick blood films were stained in 10% Giemsa stain for 10 minutes, dried and screened with microscope to detect the presence of malaria parasites and microfilaria; the species of malaria parasites were also differentiated for treatment purposes using thin blood films.

Chest X-ray for tuberculosis: Chest X-ray is a routine diagnostic method to diagnose mycobacterial infection in the lungs. A chest-X-ray was done to exclude infections of lungs. In the presence of any suspicious lesion in the lungs, the diagnosis of tuberculosis has to be confirmed by sputum examination for acid-fast bacilli using the Ziehl-Neelsen technique, sputum culture, and tomogram.

Blood for Hepatitis and HIV: Venous blood is collected in plain vacutainer for the diagnosis of hepatitis B and C. Hepatitis B is diagnosed by detecting the surface antigen (HbsAg) and hepatitis C by detecting antibodies to HCV (HCVAb) using commercial enzyme immunoassay (EIA) kits from ABBOTT company, Germany. The presence of HBsAg was confirmed by a seroneutralization test of the same company. For HCVAb screening, all specimens with absorbance value equal to or greater than the cut-off value were rechecked and considered as reactive only if both ELISA results were positive. Reactive sera were confirmed by Liatek from Organon. Antibodies to HIV were also tested in Virology Laboratory using commercial enzyme immunoassay (ELISA) kits of ABBOTT, 3rd generation[7]. All positive samples are confirmed by Western blot analysis from Bio-Rad test.

RESULTS

Prevalence of malaria: The immigrants from malaria endemic countries were checked for malaria by Giemsa stained thick blood films, and the infections were detected in 1366/921,012 (0.15%) individuals. The number of malaria cases detected in Kuwait after liberation (1991) is given in Table 1. The majority of the infected individuals were asymptomatic even though the parasitemia was in the range of 16 - 30,000 parasites/µl of blood.

Table 1
Number of malaria cases detected in Kuwait (species-wise) after invasion

Year	Pv	Pf	Pm	Po	Pv+Pf	Pv+Pm	Pv+Po	Total
1991	287	50	0	0	5	0	0	342
1992	1171	127	0	0	21	0	0	1319
1993	1092	211	1	0	74	0	1	1379
1994	713	124	0	1	38	0	0	876
1995	527	88	0	0	39	0	0	654
1996	607	151	1	0	51	1	0	811
1997	573	120	0	2	49	2	2	746
1998	265	85	0	0	30	1	12	393
1999	219	73	0	10	45	2	0	349

Pv - Plasmodium vivax; Pf - Plasmodium falciparum ; Pm - Plasmodium mlariae ; Po - Plasmodium oval

Table 2
Number of malaria and filaria cases detected among immigrants

Year	No. of samples	Malaria	Filaria	Percentage Malaria	Percentage Filaria
1991	47297	36	11	0.08	0.03
1992	99672	213	47	0.21	0.05
1993	153000	376	95	0.25	0.06
1994	94192	173	86	0.20	0.09
1995	96335	117	89	0.12	0.09
1996	106004	177	114	0.17	0.11
1997	101518	157	107	0.15	0.11
1998	114399	83	77	0.07	0.07
1999	108595	34	65	0.05	0.07
Total	921012	1366(0.15)*	691(0.08)*	1.30	0.68

* percentage in parenthesis

Table 3
Detection of tuberculosis, HIV, Hepatitis B and Hepatitis C among immigrants

Year	No. of Samples	T. B.	AIDS	Hep. B	Hep. C
1991	120303	306	62	0	0
1992	244494	996	113	0	0
1993	285898	1314	144	0	0
1994	170673	1353	64	0	0
1995	166529	669	49	0	0
1996	169227	765	37	0	0
1997	161682	737	40	0	0
1998	163326	508	51	452	318
1999	162920	427	31	742	310
Total	1645052	7075(0.43)*	591(0.04)*	1194(0.4)*	628(0.2)*

*percentage in parenthesis

Prevalence of microfilaria: Immigrants coming from filaria endemic countries were checked for microfilaria by Giemsa stained thick blood film. About 921,012 immigrants were checked and 258

(0.08%) were infected with microfilaria (Table. 2). Most of these infected individuals were from India (88%) and Sri Lanka (6.5%) and aged between 20 - 35 years.

Prevalence of HBV and HCV carriers: HbsAg was detected in 1194/326,246 (0.4%) of the individuals with a large geographical variation and the highest prevalence of infection were found among individuals from Egypt, India and Pakistan. Both males and females of 20-30 years of age were carriers of this infection. The rate of HBV infection was slightly higher in men than in women.

The prevalence of HCV infection was found in 628/326,246 (0.2%) individuals from Egypt, India, Sri Lanka and Pakistan and of the same age group like HbsAg. The results of HbsAg and HCV, HIV and tuberculosis are given in Table 3.

Prevalence of HIV: The antibodies against HIV were checked among individuals older than 12 years and the prevalence of HIV infection was detected in 591/1,645,052 (0.04%). All infected individuals were males (aged between 20 -35 years) from India, Philippines and Thailand, and were asymptomatic.

Prevalence of Tuberculosis: Active infection was detected in 7075/1,545,052 (0.4%) individuals and they were mostly from Egypt, Philippines, India and Sri Lanka, and between the age of 20 - 35 years.

DISCUSSION

All the immigrants were screened in their home countries before coming to Kuwait, and after arrival, they are screened again for infectious diseases like, malaria, filaria, tuberculosis, HIV and hepatitis B and C. The majority of these workers were asymptomatic and young, between the age group of 20 - 45 years.

Each year, 300-500 million clinical cases of malaria are reported in the world and 1.5 - 2.7 million people die of it. Of these deaths, 90% occur in sub-Saharan Africa, mainly in children under five years of age. In the Gulf Cooperation Countries, the local transmission of malaria is reported only in Saudi Arabia, whereas in other countries, malaria parasite is reported among immigrants only[8]. Oman and United Arab Emirates are now free from local transmission of malaria, like Bahrain, Kuwait and Qatar. In Saudi Arabia, the southern and south-western regions are still endemic for *Plasmodium falciparum* throughout the year[8]. Malaria in adults has a serious economic impact in terms of both productivity loss and treatment cost.

During screening, about 0.08% of individuals were carriers of microfilariae in their blood and these carriers were checked again by a very sensitive and specific antigen-capture method (immunochromatographic test) to detect the presence of circulating Og4C3 antigens and all were positive for the presence of antigens in their blood circulation[9]. Three per cent of the world population is infected with HCV and around 170 million individuals are chronic carriers at the risk of developing liver cirrhosis and liver cancer[8]. In our study, the infection rate was only 0.4%, whereas in Egypt, Guinea, Cameroon, Mongolia, Burundi and Rwanda, the prevalence rate is above 10%[10]. In the United States, four million people have contracted the disease, four times more than HIV infection; approximately 30,000 new acute infections and 8,000-10,000 deaths occur each year. The HBV infection is a global problem and more than two billion people have evidence of past or current HBV infection. In our survey, the infection rate was 0.02% only. In South-East Asia, vertical transmission has shown to be the major mechanism which accounts for high endemicity of HBV, mainly due to active viral replication in mothers[11]. In the Middle-East, 4-10% population is HBV carrier[12]. In Kuwait, 591 (0.04%) cases of HIV were detected among expatriates after liberation (1991), though they were already checked in their home countries before coming to Kuwait. Infection with HIV may precede the appearance of antibodies by several months[4]. However, some of them may be negative for up to 36 months although HIV could be isolated from blood cells. This delayed sero-conversion may be due to virus latency and lack of viral antigen stimulation, thus escaping the immune surveillance. The potential for continued spread of HIV/AIDS in Asia and the Western Pacific is real and requires determined and sustained prevention efforts.

Three million people are killed every year by tuberculosis, with 7.3 million new cases annually. One-third of these cases in the last five years can be attributed to HIV, which weakens the immune system and makes a person more susceptible to tuberculous infections[13]. The HIV-infected adult most frequently results from reactivation of latent tubercle infection[14]. 7075 (0.43%) positive cases of tuberculosis were detected in Kuwait during the study period. These individuals were sent back to their countries.

In conclusion, an increased incidence of malaria, filarial, HIV, hepatitis B and hepatitis C and tuberculosis were observed among immigrants aged between 25-35 years. The Ministry of Health is making all efforts to control the spread of these infectious diseases by examining the immigrants coming to work in Kuwait.

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