

## SEROPREVALENCE OF HBsAg, HCV AND HIV ANTIBODIES IN HEALTHY INDIVIDUALS IN MAKKAH REGION, KSA

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*People from all over the world tend to travel to KSA for seeking better jobs in a variety of fields i.e. skilled and unskilled. As per requirement of Saudi Government, all the employees must get themselves screened for HIV; HCV and HBV from the Medical Centers registered with Saudi Consulates in their respective countries prior to endorsement of visa for entering the kingdom. Once these potential employees enter the Kingdom, it is imminent for the employer to get them working permit i.e. Iqama. In the Kingdom, to obtain Iqama, once again all these employees need to get medical fitness certificate from Medical Centers registered with the Ministry of Health. This may be pointed here that HIV co-infection with hepatitis C virus (HCV) or/and hepatitis B virus (HBV) has a growing public health concern. The objective of this study is to determine the positive influx of HBV, HCV and HIV in general population of KSA and to describe associations between risk behaviours and co-infection. This study ensures that none of these new employees should escape the required law of obtaining medical fitness certificate for concealing the infectious diseases if any, and latter on become the source of spreading these diseases in the society. It is suggested that the government may give a thought to enhancing the prevailing system of medical certification to the point where it becomes infallible.*

Hepatitis B virus (HBV) is transmitted haematogenously and sexually.<sup>1-3</sup> The outcome of this infection is a complicated viral-host interaction resulting in either an acute symptomatic disease or an asymptomatic disease. Patients may become immune to HBV or may develop a chronic carrier state. Later consequences may be cirrhosis and the development of hepatocellular carcinoma (HCC).<sup>6-8</sup> Hepatitis B is a worldwide health problem, especially in developing regions. An estimated one third of the global population has been infected with this virus. Approximately 350 million people are lifelong carriers, and only 2% spontaneously sero-convert annually. Ongoing vaccination programs appear to be promising in an attempt to decrease the prevalence of this disease.<sup>7</sup>

The production of antibodies against HBsAg confers immunity and can be detected in patients who have recovered from HBV infection or in those who have been vaccinated. Antibody to HBcAg is detected in almost every patient with previous exposure to HBV.<sup>4</sup> The immunoglobulin M (IgM) is indicative of acute infection or reactivation, whereas the immunoglobulin G (IgG) is indicative of chronic infection; with this marker alone, one cannot understand the activity of the disease. Antibody to HBeAg is suggestive of a non-replicative state, and, the antigen has been cleared from the blood.<sup>9-10</sup>

The prevalence of hepatitis C virus (HCV) infection is increasing worldwide. The World Health Organization estimates that more than 170 million individuals throughout the world are infected with HCV. HCV is predominantly transmitted by means of percutaneous exposure to infected blood. In developed countries, most new HCV infections are related to intravenous drug abuse.<sup>4,5,12</sup> The screening of blood donors for HCV antibody since 1990 has decreased the risk of transfusion-associated HCV to less than 1 case in 103,000 transfused units.<sup>9-11</sup> The risk may be even lower with the use of more sensitive assays with the polymerase chain reaction (PCR) to screen blood. These newer assays have decreased the window after infection, during which the virus may escape detection, approximately for 3 weeks. HCV may also be transmitted by means of acupuncture, tattooing, and sharing razors. Needle stick injuries in the health care setting result in a 3% risk of HCV transmission.<sup>12</sup> However, the prevalence of hepatitis - C among health care workers is similar to that of the general population. Nosocomial patient-to-patient transmission may occur by means of a contaminated colonoscope; dialysis; or surgery.<sup>26,29</sup>

Immunodeficiency associated with HIV infection accelerates the course of hepatitis C.<sup>21,22</sup> In one Spanish series, as many as 25% of patients infected with HIV had cirrhosis within 15 years of

infection with HCV, compared with only 6.5% of those who were HIV negative. Co-infection with the hepatitis B virus (HBV) has also been associated with increased severity of chronic hepatitis C and accelerated progression to cirrhosis. In addition, HBV co-infection seems to enhance the development of hepatocellular carcinoma.<sup>23,24</sup>

#### MATERIAL AND METHODS

In this retrospective study between Jan. 2002 to Dec. 2004, we included all the cases i.e. males and females who visited Umm-Al Qura Gen. Hospital to obtain M.F.C. (Medical Fitness Certificate), required prior to work permit (IQAMA). In the medical center all the individuals submitted the copies of their passport, two recently prepared photographs and ID card of kafeel (sponsor / employer). According to screening program blood samples were collected, centrifuged within two hours after venipuncture, sera were frozen till their analysis. To identify HBsAntigens, Antibodies to HIV and HCV, enzyme linked immunosorbant assay technique was used. The test results were interpreted as negative or positive. All reactive sera of the patients were rechecked by different equipment (Vitros Jhonson and Jhonson Clinical Diagnostic, Buckingham, England). The persons found contracting HIV infection, their sera were referred to Ministry of Health for confirmation by Western blot and Polymerase chain reaction (PCR).

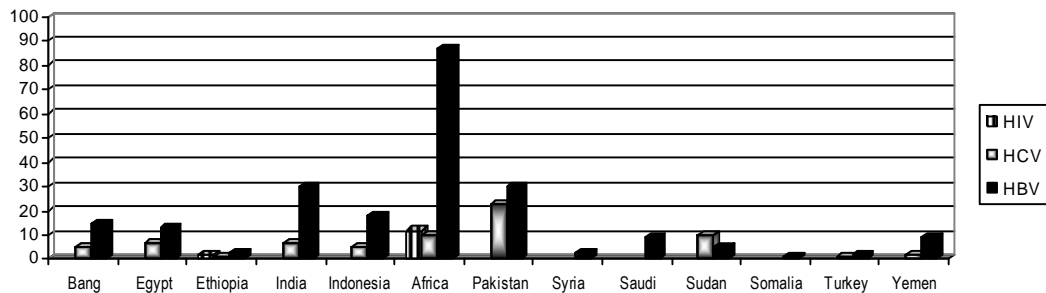
#### RESULTS

During the period of last three years, 12473 individuals visited Umm Al Qura Gen. Hospital Medical Center through their companies, kafeels and sponsors for the screening of infectious diseases. After going through the process of screening as mentioned above, it was found that 227 (1.82%) were suffering from HBV infection. A total of 67 (0.54%) persons were infected with HCV and 15 (0.12%) were positive for HIV (Table 1). As per the analytic result of HIV by nationality, it was detected that 40% (06 out of 15) were Nigerians, 13.3% (2 out of 15) Ethiopians, 6.7% (1 out of 15) from Somalia, 13.3% (2 out of 15) Niger, 6.7% (1 out of 15) Mali, 6.7% (1 out of 15) Burkina Faso, 6% (1 out of 15) Chad and 6.7% (1 out of 15) Kenya. Similarly, HBV infectivity was 38% (86 out of 227) among Nigerians, 13.7% (3 out of 227) were Indians, 13.2% (30 out of 227) were Pakistanis, Indonesia formed 7.4% (18 out of 227), 6.6% (15 out of 227) were from Bangladesh, 5.8% (13 out of 227) were Egyptians, 4% (9 out of 227) were Saudis, 2.2% (5 out of 227) were from Sudan, 0.9% (2 out of 227) were from Ethiopia and 0.4% (1 out of 227) each from Turkish, Syrian and Mali. HCV was more prevalent i.e. 35.8% (24 out of 67) among Pakistanis, 16.8% (11 out of 67) were Nigerians and Sudanese each, 9% (6 out of 67) were Indians, 7.4% (5 out of 67) were from Egypt, 4.4% (3 out of 67) were Bangladeshis and 2.9% (2 out of 67) were from Yemen. (Fig. 1), (Table 1).

**Table 1:** Tabulated data indicating number of infective cases distributed by year and month.

	Jan.	Feb.	Mar.	April	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total	Total	%
<b>Total 2002</b>	267	213	210	216	228	270	546	290	110	250	164	177	2941	
HBV	2	4	3	3	5	6	7	9	0	3	0	6	048	1.60
HCV	3	0	1	0	1	1	2	2	1	1	0	1	013	0.44
HIV	3	0	0	0	0	0	0	0	0	0	0	0	003	0.10
<b>Total 2003</b>	167	183	233	348	308	370	383	847	428	740	700	122	4829	
HBV	2	2	5	12	11	14	13	14	5	12	8	3	101	2.09
HCV	3	2	1	3	2	2	2	1	1	4	1	1	023	0.48
HIV	1	0	0	1	1	1	1	3	0	0	1	0	009	0.18
<b>Total 2004</b>	700	558	788	153	299	260	342	355	371	268	344	265	4703	
HBV	3	5	12	11	6	4	11	5	6	8	4	4	078	1.66
HCV	1	3	2	5	4	1	1	0	11	2	1	1	031	0.66
HIV	1	0	0	0	0	1	0	0	0	0	0	1	003	0.06

### Graphics Presentation of HIV, HCV, HBV



**Fig. 1:** Graphic presentation of result values of infectivity in various countries.

### DISCUSSION:

In the present study, 12473 individuals were investigated for HBV, HCV and HIV. Individuals positive for HIV were 15, all of them being inhabitants of African continents that includes regions such as; Nigeria, Kenya, Ethiopia, Niger, Mali, Chad, Borkenia Faso and Somalia.<sup>18</sup>

The results of the study were analysed and compared with prevalence levels of HIV estimated in various regions of East, West and South Africa by other studies and it was found that results correlate with the results of other studies. Africa is without doubt the region most affected by the AIDS virus. Inhabited by just over 12% of the world's population, Africa is estimated to have more than 60% of the AIDS-infected population. In South Africa 1 in 9 people are infected with HIV. In 1982, Uganda was the first state in the region to declare HIV cases. This was followed by Kenya in 1984 and Tanzania in 1985.<sup>28,29</sup>

Some areas of East Africa are beginning to show substantial declines in the prevalence of HIV infection. In the early 1990s, 13% of Ugandan residents were HIV positive; This has now fallen to 4.1% by the end of 2003. Evidence may suggest that the tide may also be turning in Kenya, where prevalence fell from 13.6% in 1997-1998 to 9.4% in 2002. Data from Ethiopia and Burundi are also hopeful. HIV prevalence in West Africa is lowest in Chad, Niger, Burkina Faso, Mali, Mauritania and highest in Nigeria. Nigeria has the second largest HIV prevalence in Africa after South Africa. In Niger, the adult national HIV prevalence was 1% in 2003, yet surveys of sex workers in different regions found HIV infection rate between 9 and 38%. The high prevalence of HIV rate of infection is recorded in Africa and influx of positive cases from Africa in kingdom of Saudia is not impossible.<sup>19-21</sup>

The seroprevalence level of hepatitis B was identified in the people of Africa (38%), India

(13.7%) Pakistan (13.2%), Indonesia (7.4%), Bangladesh (6.7%), Egypt (5.8%), Saudia (2.2%), Sudan (0.9%), Turkey and Syria (0.4%) each while hepatitis C was 35.8% among Pakistanis, 16.8% were from Africa and Sudan, 9% were Indians, 7.4% were from Egypt, 4.4% were Bangladeshis and 2.9% were from Yemen.

In 1999 and 2000, the World Health Organization, published on the global prevalence of HBV and HCV infection, around 10% of the general population of sub-Saharan Africa and much of Asia have chronic HBV infection while 170 million people were living with HCV worldwide. The highest prevalence is in Asia and Africa; 4-5% of the populations are infected. Globally, about 387 million people are (chronically) HBV infected.<sup>22</sup> However, there are differences in frequency of chronic HBV infectivity from country to country. In a recent analysis of HBV and HIV co infection in Africa reported that as many as 20% of the general population in the Democratic Republic of Congo carry HBV surface antigen.<sup>23</sup> There is also considerable variation between rural and urban settings within countries: in South Africa, for example, the predominantly rural Eastern Cape reports a prevalence of 15.5%, compared to 1.3% in the township of Soweto.<sup>30</sup> There are also dramatic differences in the HCV prevalence among different cohorts within the same country. Madhava et al reviewed data from 160 different cohorts in sub-Saharan Africa and the HCV rates ranged from 0-40%. The highest rates and widest ranges were reported in Cameroon and Burundi, but even once these outliers were excluded, the prevalence ranged between 0-17 percent. Some HCV transmission may come from unexpected sources such as tattooing<sup>12</sup>, scarification, piercing, circumcision or other ceremonial, traditional medical or cultural practices involving blood-blood exposure.<sup>4,5</sup>

In Pakistan several studies showing seroprevalence as 4-4.5% among blood donors,<sup>10-12</sup> in

India 3.4% for HBsAg and 0.28% for a HCV,<sup>30</sup> similarly in Yemen 9.8% for HBsAg and 1.1% anti-HCV<sup>26</sup> in Turkey 1.8% for HBsAg and 3-4% for anti-HCV<sup>25</sup>. In health care workers HBsAg positive were 3.27 and 5.90% positive for anti-HCV. Case-control study of the same population from October 2001 to March 2002 showed risk factors such as past hospitalization, multiple injections especially with glass syringes from general medical practitioners,<sup>4,5</sup> and also multiple sexual partners.<sup>2,3</sup> A study in 2001 among a rural population in Punjab, reported 96 (35.5%) out of 272 randomly selected healthy subjects of all ages were positive for anti-HCV, the highest reported HCV prevalence in the world, while 11 (4%) were positive for HBsAg.<sup>16</sup>

The present study was carried out at Umm Al Qura Gen. Hospital Medical Center, Makkah, to ascertain the facts and figures of HIV, HCV and HBV positive cases among various nationalities in a given time period. Upon analyzing the results of the study it was revealed that the number of infected cases isolated were not substantially high, however; the figures given in the table are still notable. As this is the result of only one medical center, therefore, if data of all medical centers of Makkah region is compiled, the number of positive cases may rise to a noticeable figure.

As a **conclusion**, it can be assumed that the infected people also manage to enter the Kingdom by obtaining false medical fitness certificates from their native countries. This practice of infected people coming to Kingdom does not meet Ministry of Health's goal to control the entry of positive cases in the Kingdom. This underscores the fact that additional steps are required to control the entry of people from the countries where these diseases are prevalent and to protect the non-infected population from these diseases, vaccination on high level will play a role of herd immunity.

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