

Serosurvey of HIV, HCV and HBV in Clinical Laboratory Workers of Karbala (Iraq) Health Care Units

¹Ali Abdul Hussein S. AL-Janabi and ²Amer Ali AL-Masoudy

¹department of Clinical Laboratory, Collage of Pharmacy, University of Karbala, Iraq

²department of Biology, Collage of Education, University of Karbala, Iraq

Abstract: For determining the prevalence of viral infection in professional laboratory workers of Karbala city, A total of 124 clinical laboratory workers of seven health units of Karbala province (Iraq) were investigated for Human immunodeficiency virus (HIV), Hepatitis C virus (HCV) and Hepatitis B virus (HBV) infections in December 2008. IgM and IgG of anti-HCV, anti-HIV and anti-HBsAg were measured by using third generation of ELISA assay. None of laboratory workers was showed a positive result for all viral infections.

Key words: HIV · HCV · HBV · Clinical laboratory workers · Karbala

INTRODUCTION

Workers in clinical laboratories of hospitals are more susceptible to infect with many blood-borne viruses. They are most probable to have viral infection during their direct contact with blood and other body fluids received from infected patients. HIV, HCV and HBV are the most important viruses can be transmitted to these workers. Hepatitis C virus (HCV) is a major cause of chronic viral hepatitis. After an estimated of newly acquired HCV, 2%-4% occurred among health-care personnel who were occupationally exposed to blood [1]. Generally, transfusion of blood products has been a leading cause of transmission of HCV [2]. Among volunteer blood donors in Karachi (Pakistan), the over all seroprevalence of HCV was 1.8% between 1998 and 2002 [3]. In Cairo, two studies found HCV in 26.6% among 188 and 22% among 163 blood donors [4, 5]. While, prevalence rates were lower in Saudi Arabia (1.8%) [6] and Yemen (2.1%) [7].

HIV is a causative agent of AIDS. This disease has killed more than 25 million people since 1981 and an estimated 38.6 million people are now living with HIV [8]. In the most severity affected countries with HIV, average life expectancy is now 49 years which seems to be less than 13 years in the absence of AIDS [8]. Because HIV weaken the immune system, people with HIV can become ill with other serious infections like Leishmaniasis [9] and some types of cancers [10].

Hepatitis B virus (HBV) is another blood-borne and sexually transmission virus [11]. It spread through contact with blood or other body fluids of an infected person, especially when skin bites, cuts or sore [12]. In the United States, chronic hepatitis B virus infection is responsible for about 5000 annual deaths from cirrhosis and hepatocellular carcinoma [13].

From other hand, HCV infection is more serious in HIV-infected persons when 50%-90% of injection drug users with HIV are also infected with hepatitis C [14]. From a total of 1877 adults and young offenders in Ontario (Canada), the prevalence of HCV-HIV coinfection between Feb. 1-2003 and June 20-2004 was 1.2% among men and 1.5% among women [15]. Additionally, because of HBV and HCV share some same modes of transmission, coinfection with the two viruses is not uncommon, especially in areas with a high prevalence of HBV infection and among people at high risk for parenteral infection [16]. Generally, there is no symptoms can be observed in many people with hepatitis C [14] and all people with HIV [10]. Thus, screening with available tests is recommended by United States Preventive Services Task Force (USPSTF) to detect viral infection [17].

Because clinical laboratory workers consider important group of hospital staffs who may infect with viral disease, this survey was performed to detect any HIV, HCV or HBV infections among these workers.

Table 1: Number of clinical laboratory workers in seven Health care units of Karbala city

No.	Health care units	Males	Females	Total No.
1	Pediatric hospital	12	3	15
2	AL-Hyndia hospital	14	6	20
3	AL-Hussein general hospital	21	7	28
4	Obstetrics and Gynecology hospital	6	8	14
5	Central bank	26	5	31
6	Public health center laboratory	1	9	10
7	AL-Hussenya care unit	5	1	6
Total No.		85	39	124

MATERIALS AND METHODS

The blood of 85 males (19-61 years) and 39 females (23-47 years) of clinical laboratory staffs of seven health care units of Karbala province-Iraq were collected in December 2008 (Table 1). Fresh serums of collected bloods were analyzed using third generation of ELISA assay by Bechman coulter instrument (AD 340, Australia). IgM and IgG of anti-HCV were determined using anti-HCV kit (Biokit, Spanish): IgM and IgG of anti-HIV were determined using anti-HIV kit (Biomérieux, Netherlands-France): and IgM and IgG of anti-HBV were determined using anti-HBsAg kit (Biomérieux-Hepanostika-HBsAg ultra, France). Data about employee dates of laboratory staffs were collected in questionnaire design.

RESULTS

After determined the IgM and IgG of anti-HCV and anti-HIV, none of laboratory staffs were show a positive result. IgG anti-HBsAg was found in two males of AL-Hussein general hospital. Employee dates of all staff when they spend in their work places were ranged from 4 months to 28 years.

DISCUSSION

One suggestion of the Centers for Disease Control (CDC) in the United States is screening for viral infections in health care, emergency medical, and public safety workers [3]. This recommendation is based on the main risks that may lead to infect health workers with HIV, HCV and HBV through needle stick or splash injuries [18]. HIV is spread through sexual contact, through blood-to-blood contact, and from an infected mother to her unborn child and not spread by food or drink, coughing or sneezing, share work, and shaking hand [10]. Meanwhile,

the main mode of HBV transmission is through sexual contact or through blood of infected persons [12]. Unlike HIV, HCV is found in high concentrations in filters, spoons, and rinsing liquids that may be used in association with needle drugs use. Otherwise, sexually transmission of HCV is less likely to occur, especially in eastern populations [19] and very low level of HCV infection may transmit to new borne from HCV-positive mothers (6 of 120 children) [20].

Although high level exposure to infected blood is expected during performing laboratory tests, our primary survey of HIV, HCV and HBV infections in laboratory staffs was showed negative results in all involvement persons, except two technician males have past infection with HBV which may related to vaccine response. From the recommendations of Immunization of Health-Care Workers (IHCW), the Hospital Infection Control Practices Advisory Committee (HICPAC), and Advisory Committee on Immunization Practices (ACIP) (2006) [1], the prevalence of anti-HCV among hospital-based health care workers and surgeons is about 1%. Akahane and colleagues (1994) [21] suggested that in view of generally low circulating levels of HCV (in contrast to hepatitis B virus), transmission is more likely to occur if exposure is repetitive and extends over time. It is well accepted that cross-contamination risk within the laboratory setting can be minimized by using universal precautions when handling all samples, whether known to be infected or not [18].

The high risk of HIV infection in laboratory workers may lead to development resistance strain of HIV that able to resist the neutralization by humoral immune [22]. The risk of transmission HIV, HCV and HBV from an infected child or mother to a health worker is very low if sensible precautions are taken, especially methods to reduce the risk of injuries from needles and other sharp instruments, and safe procedures for sterilization, decontamination, handling specimens, and reduced unnecessary laboratory tests [23]. Unfortunately, there is no effective vaccine for HIV or HCV [14] in contrast to the presence of HBsAg vaccine for HBV infection [24]. In some countries, health workers are offered post-exposure prophylactic treatment with antiretroviral drugs, but this is not available in many places [8].

Investigation for HIV, HCV and HBV infections in laboratory workers is very important due to a little or delayed symptoms signs may reveal in them after infection [10, 12]. Moreover, clinical or laboratory evidence of immunodeficiency develops within 10 years in most infected persons with HIV is common, while other

patients show long-term survivors of human HIV for more than 12 to 15 years [25]. For HBV infection, acute or recently acquired infection can be distinguished by the presence of IgM class of anti-HBc, which is detected at the onset of acute hepatitis B and persists for up to 6 months if the disease resolve [11]. Thus, detecting of viral infection in asymptomatic health workers might help prevent spread of disease or decrease the likelihood of progressive disease.

In conclusion, negative results of HIV, HCV and HBV infections in clinical laboratory staffs of health care units of Karbala city may indicate high precautions levels was taken in these places or the prevalence of viral infection is very limited in this geographical area. Other tests may need to confirm our results such as PCR and recombinant immunoblot assay (RIBA).

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