DESCRIPTIVE ANALYSIS OF IRAQI HIV-INFECTED PATIENTS

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Abstract

A total of 100 Iraqi individuals were included in this study, 50 individuals fifty of them were infected with HIV (patients group). The patients were 42 males and 8 females with age range 18-70 years. While the others 50 apparently healthy Iraqi subjects were the control group, 32 males and 18 females with the same age range as in patients group range. In the present study, HIV infection was more frequent in male than females and the difference between them was statistically significant ($P < 0.05$), and more frequent in 20-29 years group (32%) followed by 40-49 years group (30%) and (30-39) years group (18%) than other groups. The differences between age groups were statically significant ($p < 0.01$). There is no association between HIV infection and ABO blood group in Iraqi patients. However, The differences between HIV mode of transmission in patients was statistically significant ($P \leq 0.01$). The HIV patients in present study were infected with HIV virus through different routes; most of them infected by sexual contact (66%), followed by homosexual routes (20%), surgery (10%) and finally transmission from mothers to their infants (4%).

Keywords : Descriptive analysis, HIV infection, Iraqi patients.

Introduction

Human immunodeficiency virus (HIV) regards one of the serious public diseases in the world, and it estimated that 37.9 million people were living with HIV in 2018. In Iraq 393 new HIV positive cases were detected from 2008 to 2018, 124 of them in 2018. Most of them were male from Baghdad province; there age ranged from 25 years or more. The new cases in Iraq was increased each year from 2008 (5 cases) to 124 cases in 2018 (MOH, 2019).

The prevalence of HIV in Iraq is currently less than 0.1% of the population (low level epidemic), but associated vulnerability and risk factors continue to increase as a result of liberalized trade relations, unsafe sex and increased drug use. Like many developing countries of the world, Iraq faces a high risk of HIV as a result of poverty, low literacy, gender-related discrimination and inadequate knowledge of modes of transmission. There is underestimation of HIV/AIDS as a major problem for public health. Social stigma prohibits people with risky behaviors from seeking HIV testing or disclosing a positive status. Limited human and financial resources at central and governmental level, limited nongovernmental organization involvement in the programme, out-of-date guidelines, migration to urban centres, sociocultural barriers and weak prevention efforts are also contributing to the spread of HIV/AIDS (WHO, 2014).

Materials and Methods

Study groups

A total of 100 individuals were included in this study, fifty of them infected with HIV (patients group); they were referred for diagnosis and treatment to the Ibn Zuhur Hospital in Baghdad during the period October 2018 to May 2019. Anti -HIV antibody was detected in their sera by ELISA technique and confirmed by Western blot test and real time PCR analysis to expose the viral genetic material. This investigation with the diagnosis was made by the advicer medical staff in the previous hospital. Primary data were collected for each patient using a special form, all subjects agreed to provide blood samples for this work.

Specimens collection

Patients and controls blood were collected by venipuncture; 4 ml of blood was drawn using disposable syringes. The blood was distributed into two aliquots. Aliquot (2 ml) has been transferred to the EDTA pipe and frozen at -20 ºC for use.

Statistical analysis

The statistical analysis was carried out by using the statistical package for social sciences (SPSS) program, version 22 of the windows program (SPSS INC., Chicago IL, USA). Results have been expressed as ± SD mean. Using T test for categorical results, correlations were made between two classes. It was found that the P value of < 0.05 suggests statistical significance.

Results and Discussion

Findings of this work revealed that the patients were 42 males and 8 females with age range 18-70 years. While the others 50 apparently healthy Iraqi subjects were the control group, 32 males and 18 females with age range similar with patients group range.

Distribution of patients according to Sex

Human immune deficiency infected patients were distributed as 84% males and 16% females, while in control, males represented 64% and females presented 36%, as shown in Table 1. According to this result, HIV infection was more frequent in male than females and the difference between them was statistically significant ($P < 0.05$).

Table 1: Distribution of HIV infected patients and control according to sex.

Gender	Controls		Patients	
	No.	%	No.	%
Male	32	64	42	84
Female	18	36	8	16
Total	50	100	50	100
P value				< 0.05

Differences in the communal environment and the lifestyles of men and women may be involved in the essential mechanisms underlying the sex- associated differences in infection with HIV (Gregson et al., 2002).

The result of current study was agreed with Utba (2006) results who found that from a total 267 cases of HIV in 2005; HIV was more frequent in males (73%) than females (27%) in Iraq and with Akbari et al. (2019) results who found that majority of HIV infected patients in Iran were male (84.3%) and (15.7%) were female. In addition, it agreed with Benzaken et al. (2019) report when they reported that the immense developing South American country was hit hard by the HIV/AIDS pandemic in the 1980s when the first AIDS case was identified. From 1980 to June 2018, over 900,000 AIDS cases have been notified in Brazil—around 559,000 men, and 307,000 women. In 2017, men made up 81% of the 38,739 new HIV diagnoses in the United States and dependent areas. Most of new diagnoses (86%) among men were among gay and bisexual men while adult and adolescent women made up 19% (7,401) of the 38,739 new HIV diagnoses (CDC, 2017). In China, a higher HIV prevalence among males than females (Gao et al., 2019).

However, the present result was not agreed with Girum et al. (2018) when they reported that HIV is 1.62 times more prevalent among adult women than men in Ethiopia. Furthermore, it's not agreed with Addo and Altfeld, (2014) who investigated the prevalence of HIV infection in sub-Saharan Africa, the epicenter of the global epidemic, women account for approximately 60% of all people living with HIV-1, and young women aged 15–24 years represent a particularly vulnerable population for HIV-1 acquisition, accounting for more than a quarter of new infections. They attributed such high risk of HIV infection in females to several biological mechanisms; women are more vulnerable than men to infection because of the greater mucus area exposed to HIV during penile penetration. Women under age 17 years are at even greater risk because they have an underdeveloped cervix and low vaginal mucus production. Concurrent sexually transmitted diseases increase the risk of HIV transmission. Women's risk is also related to their exposure to gender inequalities in society. The social and economic pressures of poverty exacerbate women's risk (Mahathir, 1997).

Gender inequalities include vulnerability to rape, sex with older men, and unequal access to education and economic opportunities. In comparison to men, women are more likely to acquire HIV-1 at an early age, resulting in a global HIV-1 prevalence among girls and young women that is double or greater than that among males of the same age (UNAIDS, 2014).

The reason for the higher prevalence of HIV infection in males compared to females in Iraq in this study could be attributed to the social and religious aspects; as in Iraq there is a general misunderstanding of relating all HIV infections to fornication and loose morals; hence, once females are infected with HIV in any possible rout of infection they are generally unable to visit specialized health care centers for follow up; otherwise, they are subjected to persecution and domestic violence. In general, both sexes have limited understanding about this disease and awareness organizations have not been highly efficient to provide the best solution for the prevention and treatment of such infection.

Distribution of patients according to age :

As shown in Table 2, the patients were distributing into five age groups (10-19, 20- 29, 30-39, 40-49 and ≥50 years). The HIV infection was more frequent in 20-29 years group (32%) followed by 40-49 years group (30%) than other groups. The differences between age groups were statistically significant ($p < 0.01$)

Table 2: Distribution of HIV patients and control according to age.

Age group/ years	Controls		Patients	
	No.	%	No.	%
10-19	37	14	2	4
20-29	18	36	16	32
30-39	12	24	9	18
40-49	11	22	15	30
≥50	2	4	8	16
Total	50	100	50	100
P value				< 0.01

The HIV was more frequent in the ages of 20-29 and 40-49 years groups in this study because these ages are sexually active in addition to the fact that ages 40-49 are physically empowered as mixing and traveling is the main reason for the transition. While the lower HIV frequent of ages 30-39 years group in this study although they sexually active because of small samples size, this is not represented completely comprehensive for people with immunodeficiency.

The result agree with the result of WHO, (2014) report in Iraq which mentioned that the large majority HIV infected patients were males, with more than half between 15 and 29 years of age. Also with Al-Ibadi and Jaleel (2007) results in Iraq when they reported that the HIV infected cases were most frequent within the age group (< 20 yrs) and less frequent within the age group (≥ 50 yrs), with the bulk of cases occurring up to the age of (below 40 yrs). Also, it agreed with Utba, (2006) who reported that HIV was more frequent with 20-29 (34.9%), 30- 39 (32.6%) and 40-49 (14%) years age groups in Iraqi HIV infected patients. In Iran, HIV was more frequent in two age groups; 16-30 (40%) and 31-45 (50%) years than others (Akbari et al., 2019).

A European study published in 2013, in which new HIV-positive cases among young MSM (20–29 years) nearly doubled over the years 2003–2012, despite the fact that HIV cases remained stable in the general population of the European Union (Pharris et al., 2014). Similarly, a recent study from Turkey showed that there was a male predominance among newly diagnosed HIV-positive individuals, with further increases in the proportion of males in recent years, and the mean age was lower at the end of the study. Considering the high proportion of MSM among HIV-positive individuals, it appears that there has been an increasing trend of younger MSM newly diagnosed with HIV in Turkey over the last few years (Sargina and Goktasb, 2017). However, in Iraq the new cases include (20-29) years and > 40 years who have a good income to travel outside the country and have sex with HIV infected women.

Centers for Diseases Control and Prevention (2000) stated that early in the epidemic, Human Immunodeficiency Virus (HIV) infection primarily affected young adults; later on, it occurred with increasing frequency in middle-aged and

in older individuals. In fact, a rate of 12.3% of AIDS patient's aged 50 years or older, with subject's ≥ 60 years equaling 3.2%. Older subjects present with more severe HIV infection, the use of HAART allow them to achieve the same viro-immunological response as younger individuals.

At present, there is an increasing number of older subjects living with HIV either because of new HIV diagnosis in older population or because who have previously acquired HIV infection at recent time become older due to Highly Active Antiretroviral Therapy (HAART) improved survival. It is reasonable to predict that the average age of chronically treated HIV-positive patients will progressively increase in the forthcoming years. Based on this reality, ageing with HIV is a newly manifested chronic disease with a complex long-term management in consideration also of the impact of HIV and HAART on the natural history of other chronic diseases typically associated with older age (Skiest *et al.,* 1996).

Blood groups of HIV infected patients:

ABO blood groups for HIV infected patients and controls were distributed as shown in Table 3. The blood group O was more frequent in patients fallowed by blood group A, AB then B. While in control the blood group O was more frequent followed by A, B then AB. The differences between ABO blood groups frequencies were insignificant.

Table 3: HIV infected patient's distribution according to ABO blood groups.

ABO Blood groups	Controls		Patients	
	No.	%	No.	%
O	27	54	20	40
A	12	24	12	24
B	9	18	8	16
AB	2	4	10	20
Total	50	100	50	100
P Value				> 0.05

Table 3 illustrated that there is no association between HIV infection and ABO Blood group and O blood group is more frequent than other groups because O blood group is dominant. Siransy *et al*. (2015) revealed no association between ABO and Rh blood groups and viral infections (HIV infection). However, the highest frequency of infected donors was observed in blood group O with 49.74% while A was 22.51%, B was 23.53%, and AB was 4.40% in Côte d'Ivoire / West Africa.

HIV infection has been reported to occur in selected blood groups in some regions of the world. A study by Sayal *et al*. (1996) in India reported preponderance for infection in group O Rh (D)-positive men and least among groups B positive and D-negative ones. However, a close examination of the results reveals insufficient statistical analysis rendering the differences statistically insignificant. Similar studies by Nneli *et al*. (2004) and Dirisu *et al.* (2011) demonstrated similar deficiencies. In these studies, group O positive individuals were thought to be highly susceptible, but again the studies lacked the statistical rigor to indicate the level of significance and have been contradicted by other investigators (Ukaejiofo and Nubila, 2006). It would then appear that current scientific information does not support a potential role for ABO blood groups in HIV infection. In fact, evidence from other studies would suggest the contrary

for group O individuals. Since HIV virions have been shown to acquire the blood group antigens of the infected individuals, such virions would be neutralized by naturally-occurring antibodies in group O individuals, thus offering protection in blood group-discordant couples (Neil *et al*., 2003). It is noted, however, that this protection will not be available if the source of infection was from a similar blood group. Moreover, given the apparently uniform risk of infection among ABO blood groups, it is doubtful if this neutralization is of any clinical consequence, particularly with reference to HIV-1 infection. It remains to be demonstrated then whether HIV from blood group A or B is able to infect group O CD4 cells (Motswaledi *et al*., 2013).

In a separate study, Abdulazeez and Rebecca (2015) found that HIV-1 and HIV-2 were more frequent in infected patients with blood group O (42.1%), followed with B (19.4%), A (11.1%) and AB (8.7%) in Nigeria, Blood group AB recorded the highest rate of HIV-2 infection (71.4%) and the least prevalence of HIV-1 (7.1%) whereas differed from the results of this study in AB blood group because all patients included in the present study were infected with HIV-1. However, these findings are needed to be confirmed by other investigators.

Erythrocyte antigens may be important in the pathogenesis and epidemiology of many diseases, including HIV. On the other hand, HIV has emerged as one of the major public health concerns of the 21st century. Some genetic factors have been cited as contributors to HIV susceptibility or resistance, among them blood groups such as ABO/Rh (Dirisu *et al*., 2011), Duffy (Ramsuran *et al*., 2011), and Pk (Lund *et al*., 2009). However, the matter has not been without controversy as some investigators have reported findings to the contrary against what appears to be conclusive evidence of red cell interaction with the virus. Blood groups, therefore, appear to have a contribution to the public health, at least in the area of infectious disease, which makes it imperative to synthesize available knowledge in an attempt to decipher the extent to which RBC antigens are involved in HIV epidemiology (Motswaledi *et al*., 2013).

Red blood cells may be important in the pathogenesis of HIV as they enhance viral infectivity by binding free viruses as well as viral immune complexes, and through such binding transfect HIV-susceptible cells (Beck *et al*., 2009).

The lack of direct empirical evidence for ABO blood groups does not, obliterate the possibility of associations in other blood groups. Since secreted blood group substances can be adsorbed onto lymphocyte membranes, the presence of these antigens could potentially alter cell behavior (Neil *et al*., 2003). Blood group antigens, being glycoproteins and glycolipids, are highly charged molecules that are bound to affect their molecular microenvironment, including protein conformation and receptor/CD4 localization and function (Lund *et al*., 2009). Glycosphingolipids and glycoproteins have in fact been demonstrated to facilitate fusion of HIV-1 with CD4 cells by independent investigators, thus, acting as alternative co-receptors for the virus (Hammache *et al*., 1999). There exists a theoretical possibility, therefore, that membrane-bound the blood group substances on CD4-positive cells may thus affect the affinity of viral-binding proteins and viral infectivity, promoting or diminishing cell susceptibility to infection. Apparently, both the promotive

and inhibitory effects of blood groups in HIV infection have been documented (Motswaledi *et al.*, 2013).

HIV mode of transmission in patients

The HIV patients in present study were infected with HIV virus through different routes (Table 4); most of them infected by sexual contact (66%), followed by homosexual routes (20%), surgery (10%) then transmission from mothers to their infants (4%). The differences between HIV mode of transmission in patients was statistically significant (P≤ 0.01).

Table 4 : HIV transmission routes in HIV infected patients.

HIV mode of transmission	Patients	
	No.	%
Sexual transmission	33	66
Homosexual	10	20
Mother to infants	2	4
Surgery	5	10
Total	50	100
P value		≤ 0.01

These results were not agreed with UNAIDS, (2004) report when they reported that number of HIV/AIDS cases to health authorities in Iraq were very low, with 150 cumulative HIV cases reported at the end of 2000, and a total of 124 cases reported at the end of 2001. The majority of HIV infection had been reported among young men with hemophilia through infected blood products, and the mode of transmission among reported AIDS cases was 86.1% via blood products, 9.3% heterosexual, and 4.6% mother to child transmission (MTCT). Cryoprecipitates are now considered safe and produced locally or re-tested if imported (UNAIDS, 2004)

The conflict that began in Iraq in March, 2003, has severely disrupted the health care system and the following description applies to the former system of surveillance. The system of reporting and screening of HIV was tightly monitored by the health authorities.

Also its not agreed with Utba (2006) results who reported that the most frequent mode for acquiring HIV infection in Iraq was contact with blood and blood products (53.5%) followed by sexual contact (44.2%)while the mother to child transmission was reported in only (2.3%) of total cases. these results were differed from the present result, because the blood and blood products were tested for HIV before transfused to the other patients and most of HIV infected patients in this study was infected by having a sex with HIV infected women outside and inside the country after 2003.

Due to gaps in HIV services, 770 000 people died from HIV-related causes in 2018 and 1.7 million people were newly infected.

In 2018, individuals from key population groups (men who have sex with men; people who inject drugs; people in prisons and other closed settings; sex workers and their clients; and transgender people) and their sexual partners accounted for over half of all new HIV infections globally (an estimated 54%). For eastern European, central Asian, Middle Eastern and north African regions, these groups accounted for around 95% of new HIV infections. In addition, given their life circumstances, a range of other populations may be particularly vulnerable, and at increased risk of HIV infection, such as adolescent girls and young women in southern and eastern Africa and indigenous peoples in some communities. Increased HIV vulnerability is often associated with the legal and social factors, which increases exposure to risk situations and creates barriers to accessing effective, quality and affordable HIV prevention, testing and treatment services (WHO, 2019).

In Iraq, WHO revealed that of HIV infected cases, 57% were infected by blood transfusion and blood products, though sexual transmission has become the main reported mode of transmission since 2003. There are no reported cases due to injecting drugs, sex work or men having sex with men. The crisis of internally displaced people poses an increased risk of HIV/AIDS and sexually transmitted disease transmission (WHO, 2014). This result was agreed with the results of this study.

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