



The Demographic Impact of HIV Infection in Thi-Qar Province/ South Of Iraq

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ABSTRACT

The study extended from February 2022 to February 2023 in the main blood bank in Thi-Qar Province, with the aim of identifying HIV among blood donors, as the blood is one of the main ways of transmission of the virus. ELISA assay was used to screening 43,850 males and females blood donors. Thirty nine infections were recorded, all of them were males. The age group between 18 and 59 years, most of the cases of infection ranged between 30-39 years, with an infection rate of 0.12%. Most of the infection were from urban areas 0.09%. Blood group O was the highest percentage infection among the donors as it was recorded 0.12%. Also found highest infections among Rh+ with rate 0.09%.

Keywords: HIV, ELISA, Blood group, Thi-Qar, Rh phenotype

INTRODUCTION

Human immunodeficiency virus (HIV) infection is a foremost overall health worry and social difficult (Yu et al.,2019). In 2019, more than 38.0 million persons were living with HIV, and more than 1.7 million persons acquired HIV. Practically 61% of the persons recently infected with HIV living in sub-Saharan Africa (WHO,2021). In 2010, it was assessed that 68% (22.9 million) of all HIV circumstances and 66% of all deaths (1.2 million) befell in this area (Creel et al.,2011).

In Iraq the Human immunodeficiency virus was discovered for the first time in 1986, in hemophiliacs after giving them a fouled clotting factor ready from the French pharmaceutical company Merieux (now Aventis Pasteur) (Arnold, 2003). Ago that time to the ending of 2004, 260 individuals was found to be infected with HIV (AIDS Studies and Researches Center, Ministry Of Health (MOH), unpublished data).

Since 1986-2005 the number of cases was 247 (Al-Ibadi & Jaleel, 2007).as well as of 1987-2005 the cases was 448 (IRIN, 2005). The reacted of number 539 than 2010 - 2019 (Al-Koubaisy et al., 2020). Then 892 case of infection were recorded of 1986-2019 (Saleh et al., 2021). As for the studies conducted on blood donors, in the National Blood Bank in Baghdad no cases of infection were recorded of 2008 -2009 (Al-Kaysi & Ali, 2010).As for in Salah al-Din Governorate in Balad Hospital, only two cases were registered in the period from January 2017. by examining 32,942 serum samples (Mohammed et al.,2019).But Al-Nafakh et al., (2019) which recorded 23 cases among blood donors in Najaf Governorate from 2017 – 2018.

With the UNAIDS objective in mind, steps have been taken to eradicate AIDS by 2030 (Brostrom et al., 2014). However, despite the recommendation of more sensitive tests like the nucleic acid test (NAT), the ELISA test has mostly

been employed as a routine procedure. In some nations, anti-HIV antibodies may be detected with great sensitivity and specificity (Duri et al., 2011 ;Uneke et al.,2007).

The state of infection is shown by the appearance of HIV antibodies. Studies had demonstrated a correlation between the quantity, strength, and order of HIV antibodies in blood and the stage of HIV-1 infection (Tuailon et al.,2017; Huang et al.,2018).

In clinical specimens, the enzyme-linked immunosorbent test (ELISA) is frequently employed for the detection and identification of viruses and viral antigens. This test makes use of certain monospecific or monoclonal antibodies that have been produced against particular viral antigens. Both HIV-1 and HIV-2 antibodies can be found in the serum thanks to the excellent sensitivity and specificity of this test (Parija , 2013).

The first widely used HIV screening test was the Enzyme Linked Immunosorbent Assay (ELISA). The sensitivity ranges from 99.3% to 99.7%. For laboratories that process 100 or more specimens per day or more, ELISAs are most effective (Van de Perre et al.,1991).

The aim of the current study is to assess the number of HIV infections among blood donors by ELISA assay, as Iraq is one of the countries with low HIV infection.

MATERIALS AND METHODS

Collection of Samples

Two ml of blood was collected in a gel tube and 1 ml in an EDTA tube. The sample in the gel tube is separated by a centrifuge at 4000 rpm for 20 minutes to obtain the serum for the ELISA assay (using the fourth generation ELISA Foresight kit, San Diego, CA 92121,USA). Samples in EDTA Tube for blood group test in slide and tube method by use (blood group reagent, Licence No.141-P.O Box 9939,Jeddah 21423,K.S.A.) .

Statistical analysis

Chi-square test used for testing of significant association between different variables at considered if p-value equal or less than 0.05.

RESULTS

This study was conducted in the main blood bank in Thi-Qar province, Thi-Qar Health Department from February 2022 to the end of February 2023, during which 43850 donor was examined to investigating HIV infection among blood donors, who was screened by the ELISA assay. Recorded 39 (0.09%) cases of HIV infection, all of them were males as in (Table 1). And no infection recorded among females donors. The results of the statistical analysis showed that there was no significant difference between infection rate and gender at p.value 0.05.

It was found that the highest percentage of blood donors among the age group (30-39) years and the rate of infections among them (0.12%), followed by the age group (40-49) years 10(0.09%), then the both age group (20-29) and (50-59) years recorded an infection rate of 5 (0.04), while the age group less than 20 years, no recorded of infection, as in (Table 2). The results of the statistical analysis showed that there was no significant difference between infection rate and age group at p.value 0.05.

The current study also recorded a higher infection rate among blood donors in urban areas than in rural areas, where it was 32(0.09%) and 7(0.07%), respectively as in (Table 3). The results of the statistical analysis showed that there was no significant difference between infection rate and residency at p.value 0.05.

Blood group O among donors recorded the most infection, reaching 19(0.12%), followed by blood group B was 12 (0.09%), then blood group A was 7 (0.06%), while blood group AB recorded only one infection (0.02%), as in (Table 4). The results of the statistical analysis showed that there was no significant difference between infection rate and blood group at p.value 0.05.

Record Rh+ the highest percentage of donors with the rate of infection 35(0.09%) While the Rh- were the percentage of infection rate 4(0.07%) as in (Table 5). The results of the statistical analysis showed that there was no significant difference between infection rate and Rh phenotype at p.value 0.05 or less than.

TABLE 1: Distribution of HIV infections according to gender:

Gender	Blood donation	Infected
Male	43515	39(0.09%)
Female	335	0
Total	43850	39(0.09%)

CaLX2 0.58 TabX2 3.84 df 1 p.value 0.3

TABLE 2: Distribution of HIV infection according to age groups:

Age groups	18-20	20-29	30-39	40-49	50-59	Total
No.of blood donors	181 (0.4%)	11789 (26.9%)	14996 (34.2%)	10987 (25.1%)	5897 (13.4%)	43850
Infected	0	5(0.04%)	19(0.12%)	10(0.09%)	5(0.08%)	39

CaLX2 0.24 TabX2 9.49 df 4 p.value 5.44

TABLE 3: Distribution of HIV infection according to residence:

Residency	Urban	Rural	Total
No. of blood donors	34139(77.9%)	9711(22.1%)	43850
Infected	32(0.09%)	7(0.07%)	39

CaLX2 0.52 TabX2 3.84 df 1 p.value 0.39

TABLE 4: Distribution of HIV infection according to blood groups

Blood groups	A	B	AB	O	Total
No. of donation	11855 (27.0%)	12958 (29.6%)	3653 (8.3%)	15384 (35.1%)	43850
Infected	7 (0.06%)	12 (0.09%)	1 (0.03%)	19 (0.12%)	39

CaLX2 0.18 TabX2 7.81 df 3 p.value 4.83

TABLE 5: Distribution of HIV infection according to Rh Phenotype

Rh Phenotype	Rh+	Rh-	Total
No. of donation	38676 (88.2%)	5174 (11.8%)	43850
Infected	35 (0.09%)	4 (0.07%)	39

CaLX2 0.76 TabX2 3.84 df 1 p.value 0.09

DISCUSSION

Acute HIV infection and late-phase HIV infection perhaps negative or uncertain for HIV antibody test (Liu et al.,2016). Prior studies have proven that the serial emergence of HIV-1 antibodies contacts with the progress of HIV-1 infection (Kong et al.,2019).consequently the

laboratory diagnosis of HIV infection is useful for understanding the resident epidemic and might partly reveal the effectiveness of HIV/AIDS intermediation (Liu et al.,2020). ELISA technique is useful in identifying infections in large samples (Al-Moussawi et al.,2022).The primary mission of the blood bank

is to provide blood to patients and emergency situations while ensuring the safety of blood products and making them safe for recipients.

In the current study, 39 cases of HIV infection were recorded among blood donors in Thi-Qar Province, representing 0.09% of the total number of 43850 examined. This is close to the results of Al-Nafakh et al.,(2019) in Najaf, which recorded a percentage of infection (0.06%) and it differs with Mohammed et al., (2019), which recorded 2 cases of infection with a percentage of (0.03%) in Balad hospital.

The highest number of donors were males, and all infection between them this agrees with Okoroiwu et al.,(2018) in Nigeria, Who mentioned that all infection were among males.

Because males are more active than females and most of their time at work, in addition to some high-risk and arduous professions where male workers and small number of women donating blood is due to the physiological nature of women such as pregnancy, lactation and menstruation.

The age group 30-39 years was recorded the infection rate was 0.12% and this agrees with Numan & Khalil,(2021) in Baghdad which and Al-Nafakh et al.,(2019) in Najaf, those who recorded the highest percentage of infections among this age group, and differs with Dodd et al.,(2020) in America who mentioned in his study that the highest percentage of infection was for the age group 18-25 years, and in India found age group 18-30 years highest infection rate (Makroo et al.,2011).This age group is more effective than other groups, which makes the possibility of being infection is possible.

Eighty percent of blood donors were the urban and the infection among them 0.09% as for the rural, it was the donors 19.2% and the rate of infection 0.07% This result agrees with Al-Nafakh et al.,(2019) in Najaf, who recorded an infection rate among the urban and rural (0.05%,0.01%) respectively, and differs with Yambasu et al.,(2018) in Sierra Leone, who recorded (2.1%) in rural and (0.6%) in urban. As for Garcia-Calleja et al.,(2006), they recorded (1.6%) as an infection rate for both urban and rural residents.

Because the rural population has less contact with other classes of society and is less exposed to dangerous factors, as well as being far away from donation centers, which makes them the smallest numbers among donors, and this hinders the possibility of testing the largest number of them.

The blood group was recorded O a percentage 35.3% between the donors, and the infection rate was among the carriers of this blood group 0.12% this is agrees with Hroob et al.,(2020) in Jordan and Al-Nafakh et al.,(2019) but it differs with Batool et al.,(2017) in Pakistan, who mentioned the highest percentage of blood group B, and the highest percentage of infection was with blood group A. And Onsten et al.,(2013) in Brazil, the blood group B mentioned the highest rate of infection.

This may be due to the fact that carriers of blood group O have factors that contribute to the development of infection, or perhaps this group is less resistant than other blood groups (Siransy et al.,2015).

This may be due to the fact that the blood type is the general donor, and it is often given to other groups in certain cases.

Recorded current study that Rh+ was the most among the donors, and the infection rate compare with Rh-.

This agrees with Siransy et al.,(2015) and Banu et al.,(2011) India, Perhaps the reason is the large number of Rh+ blood donors, which increases the chances of detecting infection among them.

CONCLUSION

The results of the current study showed that the percentage of infection with HIV was 0.09%, and all infections were recorded among males, and the age group 30-39 years recorded the highest infection rate and among urban residents, as well as blood type O and Rh +.

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