

*Full Length Research Paper*

# Seroprevalence of syphilis among male blood donors by enzyme linked immunosorbent assay in Thi-Qar province, Iraq during 2007 to 2011

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The prevalence of infectious diseases is increasing in developing countries, and this may threaten the biological safety of donated blood. The present study aimed to investigate the seroprevalence of syphilis among male blood donors in Thi-qar province, Iraq during the period of 2007 to 2011. The study was carried out at the central blood bank of Al-Nasiriyah city, Iraq for a period of five years and screened all male blood donors for syphilis using enzyme-linked immunosorbent assay (ELISA) technique. Results were confirmed by using alternative commercial kits in the Central Health Laboratory in Baghdad. Chi-square ( $\chi^2$ ) test was used to evaluate the study result. From 2007 to 2011, a total of 52,723 male blood samples were analyzed. The overall prevalence rate of syphilis infection was (0.36%) with 192 donors showed positive sera for the five years study period with a high number of infections in 2011 year with 111 donor (57.81%). The age of donors ranged between 18 and 71 years old. The age group of 50 to 59 years showed the highest number of infections with 110 donors (57.29%), while the lowest numbers of infections were recorded in 18 to 28 age group with 9 donors (4.69%). Labourers were the most group infected with syphilis with 131 donors (68.22%), followed by policemen and civil servants with 38 (19.80%) and 23 (11.98%), respectively. According to health sections, Nasiriyah section recorded the highest infections with 146 donor (76.04%), followed by Al-Shatra, Suk-Alshuuk and Al-Refaae health sections with 24 (12.50%), 14 (7.30%) and 8 (4.16%), respectively. The present study finding may suggest that syphilis infections continue to be low in Iraq, but need more follow up programs to improve safety of blood transfusion process.

**Key words:** Blood donors, enzyme linked immunosorbent assay, seroprevalence, syphilis, labourers.

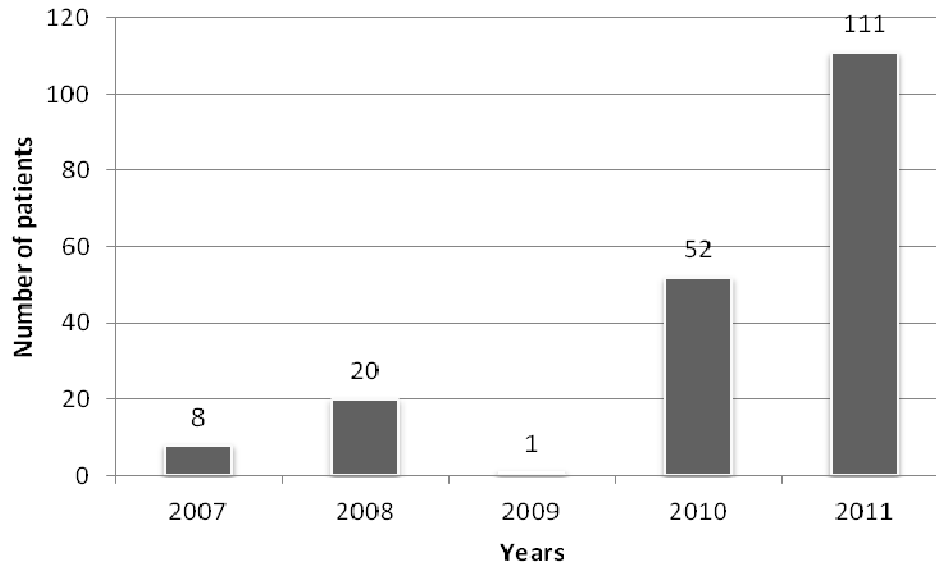
## INTRODUCTION

Transfusion-transmitted infections (TTIs) acquired through the therapeutic blood transfusion process is a major universal health problem in transfusion medicine that should be addressed. Therefore, minimizing this

complication should be encouraged (Salawu et al., 2010). Hepatitis B virus (HBV), hepatitis C (HCV), human immunodeficiency virus (HIV) and syphilis infections are public health problems that share similar routes of

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**Figure 1.** Distribution of syphilis patients according to the study years.

transmission such as sexual contact, exposure to contaminated blood or blood products, the dangerous tradition of sharing needles, intravenous drug use and transfer from mother to child (Mast et al., 2005; Alter, 2006).

Syphilis is classified as a sexually transmitted infection (STI) caused by the *Treponema pallidum* spirochete; if not treated, syphilis can cause serious effects such as damage to aorta, brain, eyes and bones. In some cases, these effects may be fatal (Olokoba et al., 2008). This study aimed to investigate the prevalence of syphilis among male blood donors in Nassyriah city, Iraq during the period of 2007 to 2011.

## MATERIALS AND METHODS

The present study was carried out and supported by central blood bank in Thi-Qar province, Iraq over a period of five years (2007 to 2011). In this duration the blood was collected from apparently healthy 52723 donors. Name, age, sex, occupation and address were recorded from each donor. The sera obtained after blood centrifugation were screened immediately for the detection of syphilis by using enzyme linked immunosorbent assay (ELISA) technique for the qualitative determination of IgG/IgM type antibodies to *T. pallidum* and according to the instructions of manufacturer companies. The study was approved by science college ethics committee.

## RESULTS AND DISCUSSION

A total of 52723 male blood donors were screened for over a period of five years. Of these donors, there were 192 seroactive cases with a percentage of (0.36%). As shown in Figure 1, there was a noticed increase in infected donors with syphilis, except in 2009 year which

showed a low numbers of infected donors with 1 donor (0.52%). The highest number of infections was recorded in 2011 with 111 donors (57.81%) ( $p < 0.005$ ). Timely transfusion of blood saves millions, but unsafe transfusion practices put millions of people at risk of transfusion transmissible infections (Bihl et al., 2007). The increased number of infected donors in recent years was noticed in other similar survey studies (Kaur et al., 2010; Sinha et al., 2012). The age of donors ranged from 18 to 71 years. The age group of 50 to 59 years had the highest prevalence of syphilis positive cases with 110 donors (57.29%). While the lowest positive sera were recorded in 18 to 28 age group with 9 (4.69%) donors ( $p < 0.005$ ). These finding was at variance from other studies (Olokoba et al., 2009; Nwankwo et al., 2012). The differences in the syphilis infection rate among the different studies may be due to differences in geographical locations, age range of blood donors, sample size, the period of the time of the studies carried out and different socio-cultural practices such as sexual behavior and marriage practices (Olokoba et al., 2009).

According to occupation as shown in Figure 2, majority of syphilis infections were recorded in labourers with 131 donor (68.22%), followed by policemen and civil servants with 38 (19.80%) and 23 (11.98%) donors, respectively ( $p < 0.005$ ). The lower or may be the absence of the education levels in most of Iraqi labourers may reflex the high incidence of syphilis in this group. These results were similar to that of what Tessema et al. (2010) found in Ethiopia. In the other hand, Alkoba et al. (2009) found that civil servants donors were more effected with syphilis.

Al-Nasiriyah health section recorded the highest syphilis infections with 146 donors (76.04%), followed by Al-Shatra, Suk-Alshuuk and Al-Refae health sections

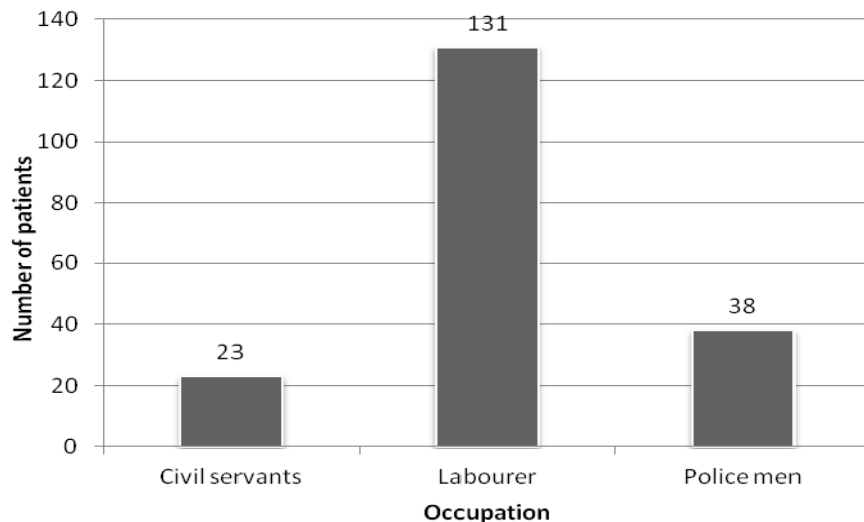


Figure 2. Distribution of syphilis patients according to occupation.

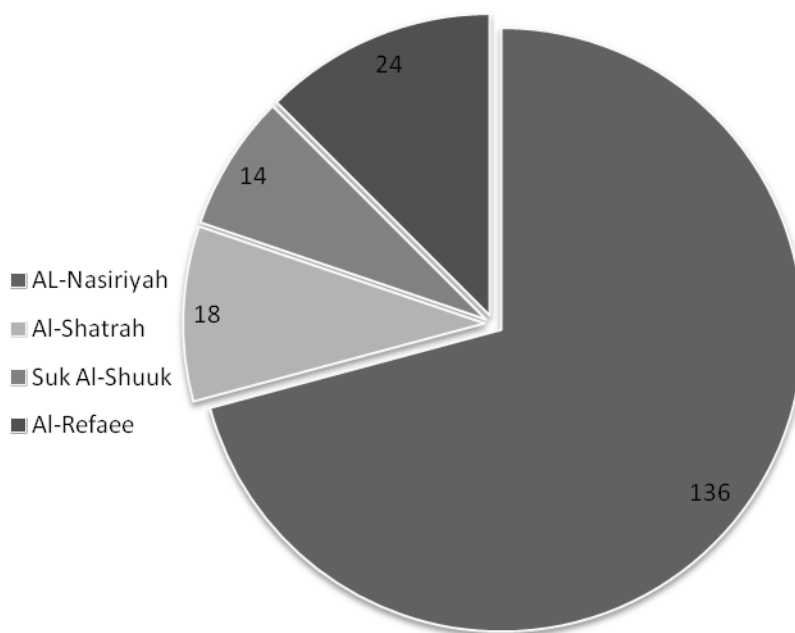


Figure 3. Distribution of syphilis patients according to medical sectors.

with 24 (12.50%), 14 (7.30%) and 8 (4.16%) blood donors, respectively ( $p < 0.005$ ) (Figure 3). Majority of syphilis infections recorded in Al-Nasiriyah section may be explained by the crowded population, in which this city is the center of Thi-Qar province.

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