

Seroprevalence of Hepatitis B in Blood Donors and Young Recruits at the HMMI of Meknes

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Abstract

Original Research Article

Introduction: The objective of our work is to determine the seroprevalence of viral markers of hepatitis B virus in blood donors and young recruits in a serving military population. **Materials and methods:** This is a retrospective study performed at the HMMI blood transfusion center in Meknes over a period of 4 years (2015-2018). The serological screening of hepatitis B in donors is carried out by immunoenzymatic ELISA (Enzyme-linked immunosorbent assay) on EVOLIS Twin plus BIO-RAD. **Results:** For the patients included in our study, 30 blood donors and 39 young recruits tested positive for Ag Hbs of Hepatitis B. The seroprevalence for this virus is 3.4 % for donors and 1 % for young recruits. We note a male trend (100% of cases). **Conclusion:** At the Meknès HMMI blood transfusion center, the seroprevalence of the hepatitis B virus is lower than in the general population. Low seroprevalence levels of the viral marker show improved preventive measures with regard to donor selection and screening tests.

Keywords: Seroprevalence, HBV, blood donation, young recruits.

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INTRODUCTION

Despite advances in transfusion safety, blood transfusion is still a risk of direct contamination by infectious agents through the passage of body fluids from one person to another. The 4 most implicated pathogens are HIV, hepatitis B and C viruses, and syphilis because the latter represent a major public health problem throughout the world [1].

According to Moroccan blood transfusion legislation, screening for these 4 pathogens has become mandatory for all blood donors or blood derivatives [2].

Subjects infected with the hepatitis B virus have a significant risk of a transition to chronic disease with the possibility of complications such as liver cirrhosis and hepatocellular carcinoma.

According to the latest WHO statistics, 2 billion people are carriers of HBV, of whom more than 240 million are carriers of chronic hepatitis B and between 500,000 and 700,000 people die each year because of the infection from this virus [3].

The objective of this study is to determine the seroprevalence of HBV among donors and young military recruits at the blood transfusion centre of the Moulay Ismail military hospital in Meknes from 2015 to the end of 2018 in order to compare them with other populations and thus assess local epidemiology.

MATERIALS AND METHODS

This is a retrospective study covering a 4-year period from January 2015 to December 2018, involving 8639 blood donors and 38240 young recruits of active and healthy military personnel.

The data were collected and processed from the records of the transfusion service of the Moulay Ismail Military Hospital in Meknes. A questionnaire and a complete physical examination are systematically carried out before each donation to select at-risk subjects; this is a crucial step in determining donors who are suitable or unfit to donate.

Samples are taken from military establishments: At the time of donation and for each suitable donor, three tubes are taken:

- An Ethylene tetraacetic acid diamine or EDTA tube for the immunological qualification of the donation (Blood group Abo/Rh phenotyping cc Ee / hemolysin research and RAI).
- Two dry tubes (one tube for HBC, HCV and HIV serologies and one tube for serum library) for serological qualification of the donation.

The detection of surface B virus antigen (HBsAg) in blood donors is performed by the Enzyme-Linked Immunosorbent Assay (ELISA) technique on the EVOLIS Twin plus BIO-RAD system. If the test is positive, the bag is systematically incinerated and the donor is called for another check and a confirmation test. If the latter is positive, the donor is referred to a gastroenterologist.

RESULTS

Of the 8639 military donors, 8466 are male (98%) and between the ages of 18 and 55. The 38240 young recruits are all male and have a age ranging from 18 to 23 years old.

30 patients were positive for HBV (0.34% of the total number of blood donations n=8639), and no association between HBV and another virus was detected.

All carriers of the hepatitis B virus are male. For the young recruits, 39 patients were found positive for HBV (0.10%) of the total number of samples (n=38240), and no association between HBV and another virus was detected.

The distribution by year is as follows: 13 cases in 2015, 8 cases in 2016, 6 cases in 2017 and 3 cases in 2018 for blood donors. 11 cases in 2015, 10 cases in 2016, 9 cases in 2017 and 9 cases in 2018 for young recruits (Figure 1).

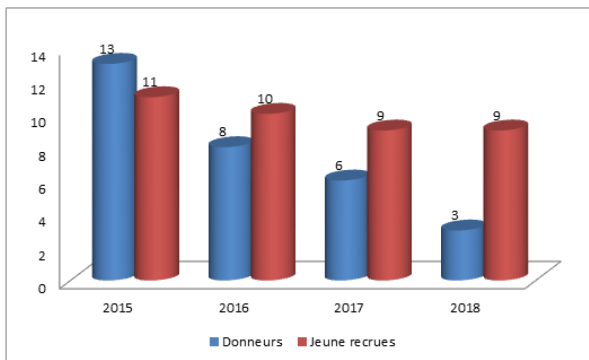


Fig-1: Number of the positives case per year

DISCUSSION

The distribution of donors by gender varies from one country to another; there is a male predominance in our study as in Burkina Faso, Tanzania and Greece [4-6]. In other countries, the predominance is female as in the United Kingdom [7].

This male predominance is explained in our study by the fact that our sample is essentially composed of male donors and young adult military recruits, and in other African studies by typical beliefs that men are more robust than women [8]. Gynecological and obstetrical factors, such as menstrual cycles, pregnancy and breastfeeding, can also prevent many women from donating blood, which would explain this trend [9].

The average age is ranging between 18 and 56 years for donors and between 18 and 23 for young recruits, which is the working age group in the military population. This result is identical to a Moroccan study of blood donors at the Mohammed V Military Hospital in Rabat [2]. On the other hand, a Malagasy study has objectified that the average age of volunteer donors tends to increase over the years, It is 37 ± 12 years [10].

In our study, the seroprevalence of HBV has decreased since 2015 when 15 cases were found, compared to 3 cases in 2018 for donors, and 11 cases in 2015 compared to 9 cases in 2018 for young recruits, even an objective finding in studies conducted at the Rabat Military Hospital where prevalence dropped from 21.7 % in 1991 to 3.97 % in 2016[2]. And compared to the general Moroccan population, the HBV prevalence rate found in our study is 4 times lower (16.6%)[11].

These data reflect the importance of the pre-donation phase and the effectiveness of blood donor screening at the Meknes MCH Blood Transfusion Centre, and the value of educating young military recruits about the main risks of hepatitis and STIs in general.

The following table compares the seroprevalence of HBV among our donors compared to donors in the Maghreb, Sub-Saharan Africa, France and the USA.

Table-3: Seroprevalence of HBV among blood donors worldwide

Pays	Seroprevalence of HBV %
Libya	12-24
Tunisia	50-100
Mauritania	107-183
France	0,73
USA	0,078
Cameroun	121,4
Ethiopia	47
Our study	3,4(donors) et 1% (youngrecruits)

From the result of Table 3, we conclude that the seroprevalence of HBV among blood donors in the Maghreb and sub-Saharan Africa is higher than ours; whether in Libya, Tunisia, Mauritania, Cameroon or Ethiopia. This may be explained by the lack of access to serological screening techniques; however, the rates obtained in France and the USA is significantly lower than those observed in our countries [2]. So Morocco is an intermediate endemic area between these 3 continents. Despite the encouraging figures in our study, it would be appropriate to strengthen efforts to raise awareness and inform the Moroccan military population.

CONCLUSION

Blood transfusion exposes recipients to the risk of transmission of infectious agents by blood despite advances in transfusion safety. Infection and complications due to hepatitis B virus (HBV) are a major public health problem worldwide. Increased awareness, screening and vaccination are needed to prevent new infections among blood donors. The prevalence of this viral marker observed in our study is significantly lower than that of the general Moroccan population, which indicates the effectiveness and improvement of preventive measures with regard to the selection of blood donors in the military population.

REFERENCES

- Ott JJ, Stevens GA, Groeger J, Wiersma ST. Global epidemiology of hepatitis B virus infection: new estimates of age-specific HBsAg seroprevalence and endemicity. *Vaccine*. 2012; 30(12):2212-9
- Jean Uwingabiye, Hafidi Zahid, Loubet Unyendje, Rachid Hadeb: Séroprévalence des marqueurs viraux sur les dons du sang au Centre de Transfusion Sanguine, Hôpital Militaire d'Instruction Mohammed V de Rabat. *Pan African Medical Journal*. 2016; 25:185.
- Flichman DM, Blejer JL, Livellara BI, Re VE, Bartoli S, Bustos JA, Ansola CP, Hidalgo S, Cerda ME, Levin AE, Huenul A, Riboldi V, Treviño EM, Salamone HJ, Nuñez FA, Fernández RJ, Reybaud JF, Campos RH, Flichman. Prevalence and trends of markers of hepatitis B virus, hepatitis C virus and human immunodeficiency virus in Argentine blood donors. *BMC Infect Dis*. 2014;14:218.
- Nagalo MB, Sanou M, Bisseye C. Seroprevalence of human immunodeficiency virus, hepatitis B and C viruses and syphilis among blood donors in Koudougou (Burkina Faso) in 2009. *Blood Transfus*. 2011; 9: 419-24.
- Mecky INM, Pius MM, Eligius FL. Seroprevalence of human immunodeficiency virus, hepatitis B and C viruses and syphilis infections among blood donors at the Muhimbili National Hospital in Dar Es Salaam, Tanzania. *BMC Public Health*. 2006; 6: 21
- Kyriakis P, Foudoulaki LE, Papoulia EI. Seroprevalence of hepatitis B surface antigen (HBsAg) among first-time and sporadic blood donors in Greece: 1991±1996. *Transfus Med*. 2000; 10, 175-80.
- Lefrère J, Rouger P. *Pratique Nouvelle de la Transfusion Sanguine*. Paris: Masson. 2006.
- Nébié KY, Olinger CM, Kafando E. Lack of knowledge of blood donor in Burkina Faso (West Africa); Potential obstacle to transfusion security. *Transfus Clin Biol*. 2007; 14: 446-52.
- Tagny CT, Owusu-Ofori, Mbanya D. The blood donor in sub-Saharan Africa: a review. *Transfus Med*. 2010; 20: 1-10.
- Rakotoniaina AI. Seroprevalence of HIV, HBV, HCV and *Treponema pallidum* infections among blood donors at the National Center of Blood Transfusion Antananarivo from 1992 to 2010. *Rev. MÉD. Madag*. 2013; 3(2): 264-268
- Sbai A, Baha W, Ougabrai H, Allalia T, Dersi N, Lazaar F, Ennaji MM, Benjouad A, El Malki A, Hassar M, Benani A. Prévalence de l'infection par le virus de l'hépatite B et l'évaluation des facteurs de risque au Maroc. *Pathol Biol (Paris)*. 2012;60(5):e65-9.
- Jegoura F. seroprévalance de l'hépatite B, C et VIH chez les donneurs du sang à l'hôpital militaire de Rabat: Thèse soutenue pour l'obtention du doctorat en pharmacie. Année. 2018.