

## Seroprevalence of Viral Hepatitis C on Donations of Blood at Moulay Ismail Military Hospital in Meknes

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### Abstract

### Original Research Article

**Introduction:** Hepatitis C is an infection with hepatocellular tropism, transmitted by the hepatitis C virus via fecal-oral, parenteral or mother-to-child transmission. Her active chronic carriage may be the cause of cirrhosis. **Objective:** The purpose of this study was to determine the seroprevalence of HCV in blood donations collected at the Moulay Ismail military hospital in Meknes in order to protect the recipients. **Material and Methods:** This is a retrospective study of 8639 military blood donors. All donors have gone through a pre-screening stage involving an anamnesis and pre-donation clinical examination associated with a biological screening performed by the 4th generation recombinant ELISA and confirmed on the Abbott Architect system. **Result:** The study is focused on 8639 blood donors, mostly male, with extreme ages of 18 to 56 years. We found an HCV seroprevalence of 0.17%. No case of co-infection has been recorded. **Discussion and conclusion:** The HCV seroprevalence rate in our series remains relatively low in comparison with the data of the literature, this could be related to the campaigns of sensitization, to the exposure of the preventive measures for the military population as well as to the success of the pre-selection stage at Moulay Ismail hospital in Meknes.

**Keywords:** Seroprevalence, blood transfusion, HCV, blood donors, blood transfusion safety.

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## INTRODUCTION

Ensuring better hemovigilance constitutes a major public health objective, particularly in underdeveloped or developing countries [1]. There is a constantly evolving range of tests aimed at reducing the risk of transmission of viral pathologies during transfusion [2]. The hepatitis C virus (HCV) is among the viral agents contracted during the transfusion procedure. This infection represents a major public health problem in Morocco and throughout the world [3].

Hepatitis C is a viral disease with hepatocellular tropism and oral-fecal and parenteral transmission. It can present in an acute or chronic form and it constitutes a major etiology of hepatocellular insufficiency, cirrhosis or even hepatocellular carcinoma [4]. Despite systematic screening for HCV when donating blood; there is always the risk of contracting this viral infection due to samples taken during the serological window. The objective of

this study is to determine the seroprevalence of HCV among blood donors at the transfusion center of the Moulay Ismail military hospital in Meknes in order to improve transfusion safety.

## MATERIAL AND METHOD

This is a retrospective cross-sectional study of serum markers of hepatitis C virus in blood donors; carried out in the immuno-serology laboratory and the blood transfusion center of the Moulay Ismail hospital in Meknes. Our study covers a number of 8639 donors who consulted during the study period.

The collection was carried out over a period of 4 years from January 1, 2019 until December 31, 2022.

The data were recorded from registers and data collection sheets existing within the HMMI transfusion center. The parameters used in our study are: age, sex,

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HCV serological screening and its evolution during the years of study. The taking of the sample from each donor is preceded by a pre-selection stage to screen donors and protect recipients: candidates for donation have benefited from a pre-donation medical interview (Age, sex, ATCD of transfusion, aberrant sexual behavior, contact with material at risk of contamination or infectious pathologies) and a general clinical and physical examination (the donors selected were in apparent good health with a correct weight and hemoglobin level without fever neither jaundice nor signs of cardiovascular damage). Donors who passed the pre-selection stage underwent blood samples in order to carry out the various qualifying analyzes linked to the collection of the donation in possible blood bags. HCV screening was carried out by a recombinant ELISA test Monolisa HCV Ag-Ab ULTRA V2 biorad (enzyme linked immuno sorbent assay) it is a 4th generation combined immuno-enzymatic technique based on the combined detection of anti HCV AC and capsid antigens in human plasma or serum. This test has a sensitivity of 100% with a confidence interval of 95% and a specificity of 98.45%. The Serums reactive to the ELISA test had benefited from a seconde technique : treatment on the Abott system for Architect.

The positivity of the 2 tests or their discordance leads directly to eliminating the donation and directing the donor to the specialized service for better management of his infection.

The data were analyzed using EPI info 3.5 software.

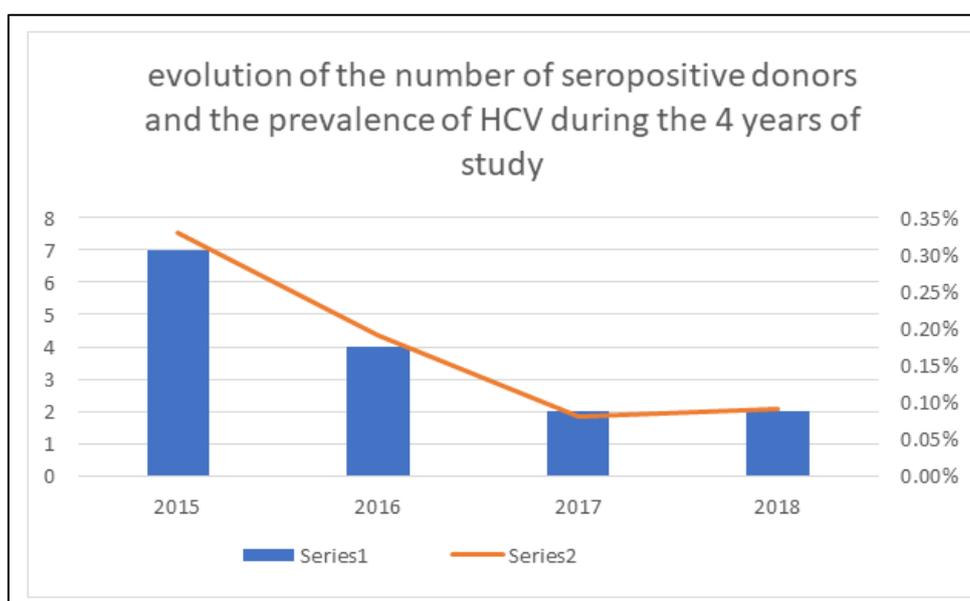
## RESULTS

During the study period we recorded 8639 volunteer blood donors, 98% of whom were male. Among the positive samples, 15 samples were confirmed seropositive for HCV, with a prevalence of 0.17%. The average age of our donors was 37 years with an age range of 18 to 56 years. HCV seropositive donors were all male. We then notice a significant predominance of men among military consultants. The distribution of the number of HCV seropositive donors among the military population who consulted the blood center during the study period was as follows:

We identified seven cases in 2019, four cases in 2020, two cases in 2021 and two other cases in 2022.

**Table 1: The seroprevalence of HCV, during the period 2019-2022**

	2019	2020	2021	2022
Number of blood donors	1918	2098	2515	2108
Number of HCV seropositive donors	7	4	2	2
HCV seroprevalence	0,33 %	0,19%	0,08%	0,09%



**NB: Series 1 represents the number of blood donors seropositive for HCV**

**Series 2 represents the evolution of HCV seroprevalence**

We note a drop in the number and seroprevalence of HCV between 2019 and 2022.No

cases of co-infection (HCV-HBV), (HCV-HIV) have been recorded.

## DISCUSSION

Blood transfusion is a noble medical procedure that saves lives, however, there is always a residual risk

of HCV transmission post-transfusion, due to the fact that the donation may well be made during a so-called silent infectious period; namely the serological window; in which antiviral biological markers are not yet produced. This risk may also exist in the event of technical errors during screening or in the event of the existence of viral variants undetectable by the kits used. The sociodemographic characteristics of our population of HCV seropositive donors were made exclusively from military, young, volunteer and male donors (100%). This result agrees with a national study carried out at the Rabat military hospital [5], this could be explained by a predominant recruitment of males in the military context. This same result is supported by civilian studies carried out in Tunisia [6], Cameroon [7] and Congo [8].

The prevalence of HCV seropositive donors at the Moulay Ismail military hospital in Meknes during the study period was around 0.17%. This percentage is much lower than that found in the total Moroccan population (1.93%) [9]. This can be explained by the effectiveness of the pre-selection stage of blood donors carried out at the HMMI transfusion center and which includes a medical interview coupled with clinical selection and

latest generation biological screening. During our study, we found a seroprevalence of HCV among blood donors of around 0.17%.

At the level of the Maghreb, this result is not very different from that found at the level of Rabat [5], and Tunisia [6]. On the other hand, in Libya, HCV seroprevalence reaches much higher figures [10].

On the international level, at the level of France [11] and the United States [12] we have had very reduced seroprevalences, this can be explained by the success of the awareness campaigns and the pre-selection stages in its governments which are almost succeed in eradicating this transmission. This seroprevalence in Egypt [13], Cameroon [7] and Ghana [14] was respectively 4.3%, 3.2% and 2.8%. There is still a high risk of transmission of HCV at the level of these countries. These data lead us to think about intensifying the level of awareness among the population; notably the military; by exposing the different means of transmission and establishing prevention programs against transfusion-transmitted infections, including HCV.

**Table 2: Percentage of HCV seroprevalence in Maghreb countries**

Studies	Military hospital Rabat [5]	Safer Tunisia [6]	Khammaj <i>et al.</i> , Libye [10]	OUR study
Seroprevalence HCV	0,39%	0,4-1,8%	8,5%	0,17%

**Table 3: HCV seroprevalence in international countries**

Studies	J. Pillonel <i>et al.</i> , France [11]	Zou S <i>et al.</i> , UNITED STATES [12]	F. Ankouane <i>et al.</i> , Cameroon [7]	Ghana [14]	Egypt [13]
Seroprevalence HCV	0,038%	0,033%	3,2%	2,8%	4,3%

The seroprevalence of HCV within our study increased from 0.33% in 2019 to 0.09% in 2020. This drop in HCV seroprevalence was also found during a study carried out at the Rabat military hospital where the HCV seroprevalence increased from 3.5% in 2010 to 1.08 in 2012 [5]. This same result is supported by a series of studies carried out in Tunisia: the seroprevalence of HCV was around 1.09% in 1991 [16], 0.7% in 1997 [17] and reached 0.4% in the year 2016 [6]. This result can be explained by an improvement in the population's awareness of the means of transmission of HCV coupled with a better selection of blood donors, especially by using increasingly efficient screening means, notably the use of reagents. combined, which is also the case for our transfusion center. We noted the absence of co-infections within our study series, something which is not always the case, especially in sub-Saharan African countries [15]; this co-infection is explained by the existence of the same mode of contamination; namely, risky sexual behavior, and intravenous contamination from drug users' syringes.

## CONCLUSION

Blood transfusion is a procedure that can save lives, however the residual risk of viral transmission constitutes a probable danger. Raising public awareness, improving preventive measures and ensuring a careful pre-selection stage makes it possible to considerably reduce the HCV seroprevalence rate among blood donors. The use of combined reagents allows better screening for HCV, which tends to promote transfusion safety. The best way to estimate the seroprevalence of donors remains to carry out prospective studies with serological monitoring of the recipient with a view to detecting seroconversion.

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