



SEROPREVALENCE OF HEPATITIS B AND C IN MOROCCO FROM 2017 TO 2022: IT'S TIME TO MOVE ON WITH WHO LOW PREVALENCE COUNTRIES?

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Morocco is ranked, according to World Health Organisation (WHO) data, among the intermediate prevalence countries for viral hepatitis B (prevalence between 2 and 7%) and C (prevalence between 1 and 2.5%) [1, 2]. This classification is based on old epidemiological data. Several recent studies have reported lower prevalence rates of hepatitis B and C in the general Moroccan population. In this sense, and in order to better understand the evolution of the prevalence of hepatitis B and C in Morocco, we carried out a retrospective analysis of data from the Virology laboratory of Mohammed V Military Teaching Hospital (Rabat, Morocco) over a period 6 years (2017-2022). HBs antigen (HBsAg) and hepatitis C antibody (HCVAb) were detected by Chemiluminescent microparticle immunoassay on the Architect i2000SR analyzer according to the manufacturer's recommendations. The results are expressed in S/CO ratio. HBsAg-positive samples with an S/CO ratio superior to 1 were confirmed by the neutralization reaction. Demographic data was extracted from the laboratory information management system (LIMS). Duplicate results or results from non-Moroccan patients were excluded. All these analyses were done for hepatitis diagnosis, and therefore we did not seek ethical approval to use these samples for research purposes and was not required for this study in accordance with national guidelines.

Over the 6 years of the study, 58.314 HCVAb and 59.144 HBsAg tests were performed, 35% of these tests were from hospitalized patients. For hepatitis B virus (HBV), 778 (1.32%) HBsAg tests were positive. The prevalence was 1.67%, 2%, 1.10%, 1.44%, 0.87% and 0.98% for the years 2017, 2018, 2019, 2020, 2021 and 2022 respectively. The average age of infected patients was 45 years (extreme ages: newborn babies to 78 years old) and the M/F sex ratio was 3.52. For the hepatitis C virus (HCV), 557 (0.95%) HCVAb tests were positive. The prevalence was 1.17%, 1.47%, 0.85%, 0.83%, 0.88% and 0.55% for the years 2017, 2018, 2019, 2020, 2021 and 2022 respectively. The average age of infected patients was 34 years (extreme ages: 1 to 86 years old) and the M/F sex ratio was 2.7.

Regarding HBV, several studies conducted in Morocco on the general population have reported HBV prevalence less than 2%. In a Moroccan working population during a free hepatitis B screening campaign in the following 15 Moroccan cities (Rabat, Sale, Kenitra, Casablanca, Eljadida, Mohammedia, Khouribga, Benslimane, Berrechid, kalaat

sraghna, Safi,Settat, Béni Mellal, Marrakech and Agadir), prevalence of HBsAg was 1.66% [3]. In the cross-sectional survey enrolling in the large screening program for hepatitis B and C conducted by the Pasteur Institute of Morocco, prevalence of hepatitis B was 1.81% [4]. Other studies conducted on blood donors in Rabat in 2013 and 2016 have reported the prevalence of 0.8% and 1.34% respectively [5, 6]. Also, according to the results of a systematic review carried out on 2020, HBV prevalence in Morocco was about 1.79% of the general population [7]. In an other study, a total of 20.192 individuals were screened for HBsAg in the Marrakech region, prevalence rate was 0.55% [8]. The pooled prevalence of HBsAg in Health Care Workers of Eastern Mediterranean and Middle East countries was found 1% in Morocco [9, 10]. The last but not the least, a national survey conducted in 2019 performed on 11996 persons, reports an HBV prevalence of 0.7% [11]. This study found that the prevalence of HBsAg was significantly higher in participants with a history of dental treatment, history of blood transfusion, history of traditional bloodletting, history of using traditional barber services and former prisoners. However, high prevalence is noted in at-risk populations, between 1 and 4.25% in patients consulting or hospitalized in tertiary hospital [12, 13, 14].

Regarding HCV, the prevalence of HCVAb is also decreasing according to several studies. Between 2002 and 2005, HCV prevalence was estimated at 4.4% in the general population in Morocco came based on reports including 11 prevalence measures on pregnant women, blood donors, and army recruits, among others [11]. In 2015, HCV prevalence was ranged between 0.2% and 2% with national HCV prevalence at 0.8% [15]. In 2019, national survey, performed on 11991 persons, reported a prevalence of 0.5% [11].

This decline in the prevalence of hepatitis B and C is related to several actions carried out by Morocco in the fight against its diseases. Starting with setting up systematic HBsAg screening of blood donors was introduced in 1994 and HBV vaccination in the 2000s. Vaccination coverage for children under 1 year has increased from 33% in 2000 to 93% in 2005 [16]. In 2022, for people between 5 and 18 years old, 97% of them had received at least one dose of the HBV vaccine and 91% had received 3 doses [17]. Therefore, we can easily assume that in the upcoming years, most adults will be vaccinated leading to a significant decrease in HBV-positive cases. On the other hand, information and

Screening campaigns using rapid diagnostic orientation tests (TROD) are regularly carried out, particularly among populations at risk (prisoners, injection drug users, etc.). Direct Antiviral Agents (DAA) have been introduced with affordable prices on the Moroccan market since 2015 for HCV treatment. An epidemiological surveillance system has been set up for hepatitis which are notifiable diseases in Morocco [2].

In addition, Morocco has implemented a national strategic plan against viral hepatitis (2022-2026), thus contributing to the implementation of the global strategy of the WHO. This plan has two main objectives: first to reduce viral hepatitis-related mortality by 50% by providing universal access to quality prevention and care services, second, to reduce new viral hepatitis infections by 50% by 2026 with a view to eliminate them as a major public health problem in Morocco by 2030. The plan is based on strengthening measures to prevent the transmission of viral hepatitis, screening by innovative methods, diagnosis of chronicity and supported by the safest and most effective molecules. Additional measures will also be implemented to achieve the objectives of the strategic plan, such as strengthening governance and improving strategic information related to viral hepatitis [2].

In Morocco, our survey is one of the longest in time and the most important in terms of the number of patients tested. Also, Our hospital draws patients from all over the country. Our results could constitute a reliable basis for reclassification of Morocco by WHO among countries with low endemicity for HBV and HCV. Indeed, the American CDC, in its last report of March 2023, classifies Morocco among the countries with a low prevalence of hepatitis B (< 1.9%) [18].

Undoubtedly, the objectives of the national plan against viral hepatitis require raising public awareness, strengthening prevention measures, particularly in healthcare settings and group at risk (vaccination coverage, screening campaign, hospital hygiene, management of sharp waste, management of blood exposure, viral genomic screening of blood donations, etc.), improvement of the reporting and monitoring system (computerization of the epidemiological monitoring and reporting system as well as a national registry of viral hepatitis) and finally, the implementation of a simplified circuit for taking charge.

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