

# What are the particularities of hepatitis B virus awareness, among care workers and medical Students in an endemic country?

## **Abstract :**

The hepatitis B virus is well known for its contagiousness, especially among healthcare workers due to their direct contact with blood products, affecting both healthcare personnel and patients. This highlights the importance of our study, which sheds light on the underestimation of the seriousness of this virus's spread and emphasizes the significance of vaccination by sampling students starting from the third year, interns, and residents.

**Aims:** To assess knowledge about hepatitis B virus (HBV), its infectious risk, vaccination against HBV, and the vaccination coverage rate within our population.

**Study design:** We conducted a descriptive cross-sectional study

**Place and duration of the study:** The study was conducted from October 2022 to July 2023, in Hassan II regional hospital in Agadir, Morocco.

**Methodology:** We were using an anonymous questionnaire that was completed by 267 participants as our foundation.

**Results:** Less than half (48.3%) were aware that complete vaccination requires at least 3 doses, with only 27.3% reporting being fully vaccinated. 40% were aware of the existence of anti-HBV Ig. Regarding practical attitudes towards Blood borne exposure incident, 25% of our study population had been exposed, with causes of non-reporting including underestimation of risk in 59% of cases and administrative difficulties in 49% of cases.

**Conclusion:** Our study highlighted the lack of information regarding basic HBV knowledge and the severity of its transmission, leading to a very low vaccination rate among healthcare personnel. This underscores the importance of thorough awareness campaigns targeted at those affected.

**Keywords:** *Hepatitis B vaccine, medical students, health care workers, accidental exposure to blood.*

## **Introduction:**

The extent of the endemicity of hepatitis B virus (HBV) infection poses a major challenge for global public health, given its natural progression from acute hepatitis to chronic hepatitis, cirrhosis, and hepatocellular carcinoma (HCC) [1].

In the Moroccan context, our country is classified as having a moderate level of endemicity. According to the latest national seroprevalence survey on viral hepatitis conducted in 2019 by the National Ministry of Health, the prevalence of hepatitis B in general population was 0.7% [2,3].

Healthcare personnel, including medical students, represent a population at high risk of contamination by the virus, particularly through contact with contaminated materials and blood exposure incidents (BEI). A national multicenter study revealed a higher prevalence of 2.2% among physicians [2], this suggests several reflections: is it due to insufficient awareness despite the availability of the vaccine? Or is it a negligence of the infectious risk?

## **Materiel and Methods:**

-We conducted a descriptive cross-sectional study from October 2022 to July 2023, including medical students from the third to the seventh year of medical studies (externs), interns, and residents from all medical and surgical specialties, practicing at Hassan II Regional Hospital in Agadir.

-We calculated the sample size using a prevalence of vaccinated professionals in Cameroon at 18%, an alpha risk of 5%, and a precision of 0.05. The minimum sample size required was 227 [4-6].

-Data collection was done using an anonymous online questionnaire, and statistical analysis was performed using Excel and Jamovi software. Participants were asked for consent before filling out the questionnaire.

-Our questionnaire consisted of 25 questions, organized into three main chapters:

- ✓ Sociodemographic and professional data,
- ✓ Assessment of knowledge and practical attitudes related to the risk of HBV infection, especially during a Blood Exposure Incident (BEI),
- ✓ Evaluation of knowledge about HBV vaccination and verification of vaccination status, suggestions and proposals to improve the awareness and its vaccination among hepatitis B virus

-To assess the level of general knowledge about the virus, its infectious risk, and vaccination, we calculated the average of correct responses. Knowledge level was noted "Good" if the average of correct answers was 75% or higher; "Moderate" if correct responses were between 50% and 75%; and "Low" if the knowledge level did not exceed 50%.

## **Results :**

-Our population consisted of 267 individuals who completed the questionnaire, with a median age of 23.7 years ranging from 19 to 36 years. Most of our participants were female (65%), and 35% were male, resulting a sex ratio (M/F) of 0.5. Among the respondents, 152 were medical externs, accounting 57% of the sample, while 23.2% (n=62) were residents. There was a lower representation of interns, with 52 participants accounting for 19.5%.

### ***Knowledge about HBV:***

-The first question focused on the virus transmission routes: we observed that the contamination through blood, sexual fluids, and vertical routes were mostly mentioned by 98%, 93%, and 89% respectively. However, the salivary route was only known by 23.6% of participants, primarily among interns, and 29% responded that the virus has an oro-fecal transmission.

-Overall, the level of knowledge about HBV transmission routes was good.

### ***Knowledge about HBV Vaccination:***

-In this section, we asked 4 questions regarding:

- ✓ The World Health Organization's recommendation of this vaccination for healthcare personnel,
- ✓ The necessity of 3 doses for complete vaccination,
- ✓ The vaccine's efficiency,
- ✓ The existence of immunoglobulins against HBV.

-We concluded that less than half (48.3%) knew that complete vaccination requires at least 3 doses, and only 40% were aware of the existence of anti-HBV immunoglobulins, indicating a low level of knowledge regarding these two points. 66.3% (n=177) responded that vaccination is mandatory for medical professionals, and 77.5% (n=207) knew that HBV vaccination is effective.

-Regarding knowledge about vaccine adverse effects: the two main answers were allergic reaction and multiple sclerosis, respectively at 35% and 34% (Figure 1).

-For vaccine contraindications, we included among the choices: pregnancy, Human Immunodeficiency Virus (HIV) co infection, multiple sclerosis, history of severe allergic reaction, and elderly status. The majority response was a history of severe allergic reaction at 38%, followed by HIV coinfection at 27% (Figure 2).

-The level of knowledge for both vaccine adverse effects and its contraindications was poor, among our population study.

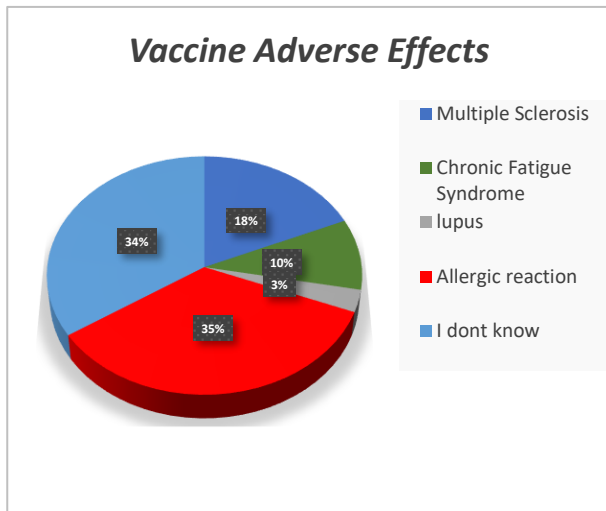


Figure 1: Knowledge about Vaccine Adverse Effects

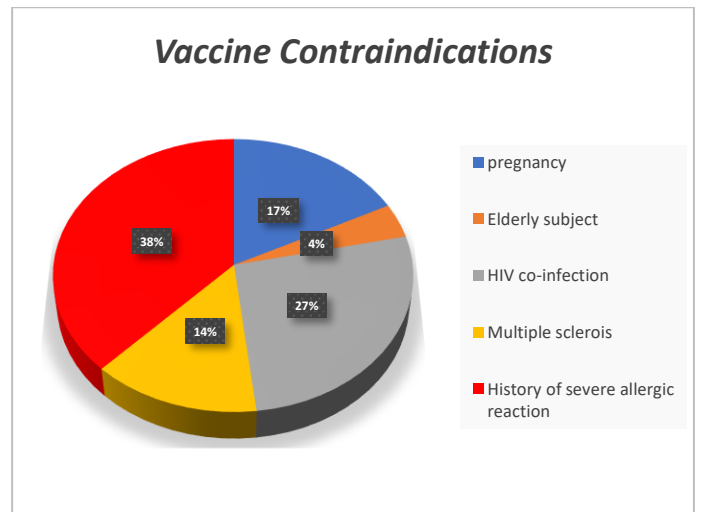


Figure 2: Respondents' Knowledge about Vaccine Contraindications

### Vaccination Status

-Out of the total 267 individuals surveyed, only 27.3% (n=73) reported being fully vaccinated, while 38% were incompletely vaccinated and 25% were not vaccinated at all. Among those vaccinated, vaccination was done through the national immunization program in 56.3% of cases, during a mass campaign in 32.5% of cases, and personally for 10.7%.

-The main reason for non-vaccination among the unvaccinated was negligence in 82% of respondents (142 individuals), followed by fear of adverse effects in 9.4% (16 individuals). The remaining 13 respondents were distributed among vaccine cost (6.4%) and HBV infection concerns (1.2%) (Figure 3).

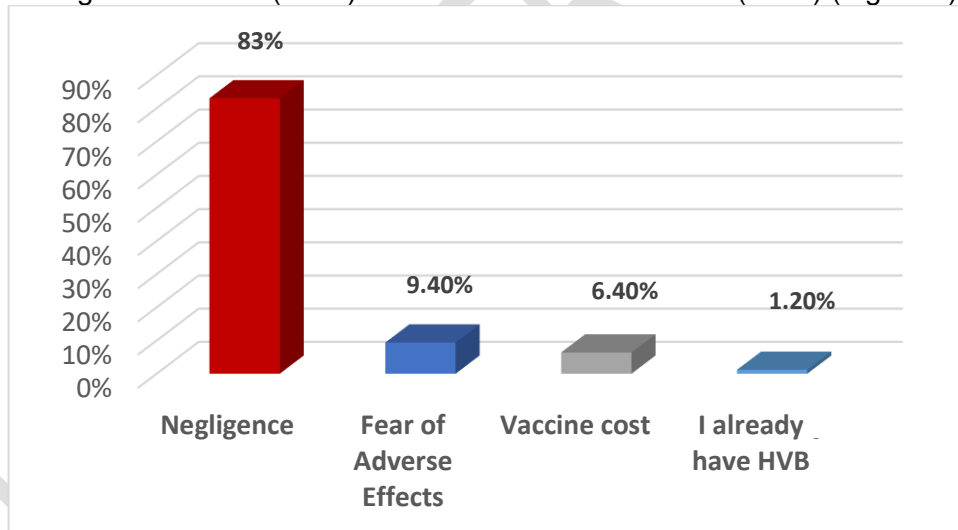


Figure 3: Reasons for Abstaining from Vaccination among the Unvaccinated

### Practical Attitudes during Blood Exposure Incidents (BEIs):

-Regarding practical attitudes during a BEI, which represents the main risk of contamination among health care professional: we noticed that 25% of our study population had already been exposed; residents were the most exposed accounting for 48.4% of cases? However, only 25% of individuals who experienced a BEI reported it to the occupational health physician.

-The reasons for non-reporting were attributed to underestimating the risk in 59% of cases and administrative difficulties in 49% of cases.

## Discussion:

-HBV is a DNA virus, posing a serious public health problem on a global scale. Its risk lies in the progression towards severe and deadly complications. 5 to 10% of infected adults become chronic carriers, with about 20% developing cirrhosis or HCC due to continuous virus replication.

-The virus reservoir is human, and its transmission occurs interpersonally. In infected individuals, the virus is present in blood and its derivatives, semen, vaginal secretions, breast milk, saliva, and to a lesser extent, tears, sweat, and urine.

-Healthcare professionals are the most exposed to HBV infection due to direct contact with infected patients' fluids and medical equipment. Understanding the infectious risk of HBV and the importance of vaccination is crucial for reducing infection rates.

-In our study, the level of knowledge regarding HBV transmission routes was good, the majority recognized the blood (98%), sexual (93%), and vertical (89%) routes. However, a minority mentioned the possibility of oro-fecal transmission. These figures are almost similar to those reported in the study conducted by Fortes Déguénonvo et al. in Senegal [7].

-Hepatitis B immune globulin is an injection of immunoglobulin G (IgG) to protect against infection and disease progression. The administration of immunoglobulins may be used in certain situations, such as post-exposure prophylaxis after contact with contaminated blood or in newborns of HBV-positive mothers to prevent vertical transmission. These immunoglobulins provide temporary protection against infection and are often used in combination with the hepatitis B vaccine to boost short-term immunity. However, it is important to note that the effectiveness of immunoglobulins decreases over time, and complete vaccination remains necessary to ensure long-term protection against HBV.

-The World Health Organization (WHO) states that there is no causal link between the HBV vaccine and demyelinating neurological conditions such as multiple sclerosis, autoimmune diseases, diabetes, and chronic fatigue syndrome. The only confirmed adverse effect of the vaccine is the occurrence of mild allergic reactions within 24 hours of injection. Regarding contraindications, the WHO confirms that the only contraindication to the vaccine is a history of severe allergic reaction. Neither pregnancy, HIV co-infection, age, nor other comorbidities are contraindications to the vaccine, which is considered to have high safety and efficacy [8].

-Regarding BEI, one-quarter of our target population had already been victim of at least one blood exposure incident. A study conducted at the hospital in Casablanca in 1998 targeting healthcare workers found that 81% of participants had been exposed to blood at least once [2]. Thus, the knowledge about post-exposure management is crucial.

-Regarding vaccination, only 27.3% were fully vaccinated in our study, which is a very low rate. In Nepal, in 2020, 60.8% of students were vaccinated, with 60.9% of them receiving at least 3 complete doses, but in Saudi Arabia, 38% had received all 3 doses of the vaccine; and in Cameroon, only 18% of participants were fully vaccinated, according to their findings [4,9,10].

-Concerning abstention among the unvaccinated, the predominant reason was negligence in 82% of cases, a common argument with the study by Altamimi et al. conducted at public universities in Riyadh [11]. This underscores the importance of collective awareness about the complete vaccination for healthcare professional, and the necessity of ensuring widespread availability of the vaccine in Moroccan healthcare, and regulating it through Moroccan law.

## **Conclusion:**

-Our study demonstrated a lack of information regarding basic HBV knowledge, particularly a significant unawareness of the existence of hepatitis B immunoglobulins.

-The fear of developing multiple sclerosis remains a concern even among medical personnel, highlighting the need to increase awareness about vaccine adverse effects and contraindications during theoretical training and vaccination campaigns.

-The risk of HBV transmission is underestimated during a Blood Exposure Incident (BEI), and administrative difficulties hinder medical personnel from reporting such incidents.

-There is a low rate of complete vaccination against hepatitis B among the studied population, underscoring the need for increased awareness and initiatives to improve vaccination coverage.

## **Consent :**

All the participants in our study were asked for consent before filling out the questionnaire

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