

# Hepatitis B Surface Antigen (HBsAg) seroprevalence in a senegalese “prevent mother-to-child transmission of HIV” cohort

## Abstract

**Introduction:** Senegal is classified by WHO among the countries where the prevalence of HBV is high ( $\geq 8\%$ ). To better address the management and prevention in both HBV-infected and -uninfected patients in decentralized areas of Senegal, we investigated the prevalence of chronic hepatitis B infection in a Prevent Mother-to-Child Transmission of HIV (PMTCT) for Dried Blood Spots in Senegal.

**Objective:** The objective of our work is to find the frequency of hepatitis B infection in both HIV-positive and -negative patients from a PMTCT cohort. From Dried Blood spot in Senegal.

**Materials and Methods:** We analyzed 930 patients from a PMTCT cohort, among whom 24 were HIV-positive, 905 were HIV-negative and 1 was questionable HIV-positive. The samples were submitted to the test kit Determine HBsAg→, the ELISA kit Microscreen HBsAg→ and HBsAg ELISA Qualitative Architect II→ kit for the detection of HBsAg.

**Result:** The average age was 26.5 weeks and the sex ratio was M/F = 1.27. Patients were predominantly male with 520 (56.0%). The overall frequency of HBsAg was 3.09% (0% in HIV patients and 3.09% in HIV-negative the highest prevalence was in HIV-negative patient's under 6 weeks, which was 11%. The second highest prevalence was in HIV-negative patients 18-24 weeks with 5% positive for HBsAg, followed by 3% prevalence rate in patients 12-18 weeks. In the group of HIV-negative patients, HBsAg was more prevalent among women (3.66%) than in men (2.50%) (Table 1 & 2). In addition, the overall analysis of HIV prophylactic status showed that the majority of the mothers used the combination AZT + 3TC + NVP. Finally, HIV-negative patients are more likely exposed to HBV infection.

**Conclusion:** The incidence of hepatitis B is high in children not infected with HIV, with the prophylactic status of mothers showing a majority use of the combination AZT + 3TC + NVP. Finally, HIV-negative patients are more likely exposed to HBV infection.

**Keywords:** DBS, Hepatitis B virus, HIV, ELISA, Vaccination, WHO, HBV infection, HIV-negative, Transmission, Prevention, HBsAg, Risk factors

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**Abbreviations:** VHB, Virus De L'hépatite B; PTME, Programme De Transmission Mère-Enfant; DBS, Dried Blood Spots; WHO, World Health Organization; HBV, Hepatitis B virus; PMTCT, Prevent Mother-to-Child Transmission of HIV

## Introduction

Infection with hepatitis B virus (HBV) is a public health problem, especially in sub-Saharan Africa. In 2010, the World Health Organization (WHO) estimates that more than 2 billion people have been in contact with 350 million suffering from chronic HBV infection. Over one million of them die each year from complications related to this infection, particularly cirrhosis and Hepatocellular carcinoma, HBV being the second cause of death after tobacco. The risk of chronicity is 90% in children less than one year, 25-30% in children aged 1 to 5 years as part of a Family transmission.<sup>1-4</sup> In West Africa, the prevalence of viral hepatitis B is high. The transmission of HBV from mother to child occurs mainly during the perinatal period. It is particularly high (70 to 90%) when the mother of HBV replication markers. In the absence of active replication, the risk of transmission is now only 10-40%.<sup>5</sup>

In Senegal, vaccination is carried out from 6 to 8 weeks with the hexavalent vaccine (Diphtheria, Tetanus, Pertussis, Polio, Haemophilus influenzae b and hepatitis B) in a comprehensive scheme of 3 injections<sup>1,6,7</sup> [www.hepatitesafrique.org / index.php / 1-initiative/ support-of-pnlh]. The low prevalence of HIV and the risk of coinfection HIV / Hepatitis B in Senegal accentuate its socio economic and health situation. His association with HIV promotes its chronicity and accelerates degeneration of the liver. No data is available nationally on HBsAg The frequency in HIV-positive mother of children born from the paper Blotter, to better address the management and prevention both in infected patients that uninfected in decentralized areas from the Blotter paper where the interest of this study aims to investigate the importance of both hepatitis B infected patients than uninfected PMTCT from blotting paper in Senegal.

## Materials and methods

This cross-sectional, descriptive and analytical study was conducted from July 2007- November 2012 conducted on DBS samples collected in decentralized sites of the mother to child transmission program (PMTCT) of HIV in Senegal. All valid DBS collected in children aged 2 weeks to 15 years old and born to HIV-

positive mothers were included. The study population of 930 patients aged 2 weeks to 15 years, divided into two groups: 24 patients infected with HIV and 877 non HIV-infected patients followed in the various decentralized health centers in Senegal. All patients infected or not by HIV in the heart of our study were set treatment of the first patients of the Senegalese initiative of access to antiretroviral (ISAARV) which was facilitated and supervised by projects like ANRS 1215.

A venous sample dry tube allowed seeking HBsAg by a rapid test Determine the AgHBs→ (Abbott Diagnostics Japan), and ELISA Kit ELISA Microscreen HBsAg (Span Diagnostics Ltd.) and the ELISA kit Architect HBsAg Qualitative II → (Abbott Diagnostics Japan). The HBV infection was predicated on the basis of positive HBsAg antigenemia. Data were analyzed by the Epi-Info software and kappa test was used to measure the degree of concordance between tests with the grid of interpretation of Landis and Koch.<sup>8</sup> And also utilized for the comparison of Variables with a significance level <0.05.

## Results

During the study period 930 patients we tested PMTCT. The HBs antigenemia was not positive in PHAs. The average age was 26.5 weeks and the sex ratio was M / F= 1.27 for males with 520 men and 409 or 56% women 44%. All 930 children infected with HIV PMTCT, 24 were positive and on antiretroviral therapy to HIV-1. The overall frequency of HBsAg was 3.09% (0% in HIV patients and 3.09% in HIV-negative). The highest prevalence was in patients under 6 weeks HIV-negative, which was 5, 04 with 11% positive for HBsAg followed by 1.22% for patients 12-18 weeks. In the group of patients not infected with HIV-1 against, HBsAg was more prevalent among women (3.66%) than in men (2.50%) from the blotting paper (DBS) (Table 1 & 2). In addition, the overall analysis of prophylactic status mothers shows majority use of the combination AZT + 3TC + NVP and found that HIV-negative patients are more exposed significantly to hepatitis B (p= 0.61) on blotting paper (DBS) in the heart of our study. On found that HIV-negative patients are more exposed so.

## Discussion

The prevalence of HBsAg highest was in patients under six weeks who was HIV- negative 5, 04 with 11% positive for HBsAg followed by 1.22% for patients 12-18 weeks. In the group of non-HIV-1 patients, HBsAg was more prevalent among women (3.66%) than in men (2.50%) from the blotting paper (DBS) Men (2.50%) from the blotting paper (DBS) (Table 1 & 2) by cons according to a study, the prevalence of HBsAg were 12.7% in a cohort of patients living with HIV in Burkina Faso.<sup>9</sup>

**Table 1** Characteristic of the study population

Regions	Effective	Percentage
Dakar	320	34,4
Diourbel	45	4,8
Fatick	36	3,9
Kaffrine	2	0,2
Kaolack	57	6,1
Kédougou	15	1,6
Kolda	50	5,4
Louga	40	4,3
Matam	14	1,5
Saint-Louis	58	6,2
Sédhiou	63	6,8
Tambacounda	44	4,7
Thiès	46	4,9

Table Continued...

Regions	Effective	Percentage
Ziguinchor	132	14,2
Non precise	8	0,9
<b>Sex (Ratio M/F=1,27)</b>		
Masculine	520	56,0
Féminine	409	43,9
Non precise	1	0,1
<b>Age Brackets (Age Median 20 Weeks)</b>		
< 6 Weeks	218	23,4
6 - 12 Weeks	163	17,5
18-Dec Weeks	74	7,9
18 - 24 Weeks	109	11,7
24 - 30 Weeks	64	6,9
30 - 36 Weeks	101	10,8
36 - 42 Weeks	35	3,8
42 - 48 Weeks	53	5,7
> 48 Weeks	95	10,2
Non precise	18	2,0
<b>HIV Status</b>		
Negative	905	97,3
Positive	24	2,6
Doubtful	1	0,1
Total	930	100,0

**Table 2** Distribution of the results of HBsAg tests according to the characteristics of the population

Characteristic	AgHBs Reactive	Non- Reactive	Total
<b>AAge Brackets (N=912)P=0,415</b>			
< 6 Weeks	11	207	218
6 - 12 Weeks	2	161	163
18-Dec Weeks	3	71	74
18 - 24 Weeks	5	104	109
24 - 30 Weeks	1	63	64
30 - 36 Weeks	2	99	101
36 - 42 Weeks	0	35	35
42 - 48 Weeks	2	51	53
> 48 Weeks	2	93	95
<b>Sex (n=929) p=0,302</b>			
Masculine	13	507	520
Feminine	15	394	409
<b>HIV Status (n=930) p=0,671</b>			
Negative	28	877	905
Positive	0	24	24
Doubtful	0	1	1

## Conclusion

The incidence of hepatitis B is high in non-HIV-infected children with prophylactic status of mothers showing a majority use of

the combination AZT + 3TC + NVP. Moreover, we find that the prevalence of hepatitis B in children aged less than 6 weeks from the paper Blotter (DBS) rose 5% .This leads us to say that preventive measures such as screening and vaccination should be strengthened at birth in children regardless of HIV serostatus. In order to achieve more substantial results, further work is needed to investigate the risk factors for hepatitis B and other markers of hepatitis B in paired samples DBS/Serum from DBS.

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## Conflicts of interest

None.

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