

Assessment of knowledge of Senegalese dentists on hepatitis B: A cross-sectional survey

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Abstract

Introduction: Hepatitis B poses serious public health problems worldwide, given its prevalence and associated mortality. The aim of this work was to study the knowledge of dental surgeons about viral B infection.

Method: This was a descriptive, cross-sectional study of a sample of 171 dental surgeons. A probabilistic multistage, stratified and systematic sampling was used. The information collected using a questionnaire included socio-demographic characteristics, variables related to knowledge about hepatitis B.

Results: There were more male dental surgeons (67.3%) and the average of the professional exercise duration was 10 ± 8 years. Nearly 2% of dental surgeons felt that there was no risk of needle sticking already used in a patient with hepatitis B virus; it was the same for more than 8% and 15% for the bite and kissing with a patient with HBV.

Conclusion: It remains important to develop awareness and information programs for dental surgeons on the different risks of HBV transmission.

Introduction

Viral hepatitis is an inflammatory disease of the liver most often due to one of the seven viruses of hepatitis A, B, C, D, E, F and G. These viruses are responsible for acute and chronic infections. The most severe are viruses B and C which are responsible for chronic hepatitis, sources of serious complications such as cirrhosis and liver cancer. Chronic hepatitis B and C pose serious public health problems worldwide, given their prevalence (nearly 500 million people) and their associated mortality (nearly one million deaths a year) [1]. According to the WHO, a good prevention policy is the most effective way to reduce the risk of spreading these viruses and protect people with the disease. Vaccination remains the safest way to be protected [2]. In Senegal, a hepatitis B prevention policy was initiated in 1998. Two successive prevention plans have been implemented since 1999. The last plan emphasizes the importance of measures aimed at at-risk populations, particularly health professionals. Health including those in training. In fact, infection with the hepatitis B virus was recognized in the 1950s as a professional risk for healthcare staff, following the occurrence of group cases of hepatitis after a blood exposure accident. (AES) from a source patient carrying the virus [3].

Health care workers are at risk not only of being infected by the virus but also of transmitting it to patients. Authors have concluded that 6800 unvaccinated health workers in the United States are infected with HBV each year, and about 100 will die of cirrhosis, liver cancer or fulminant hepatitis [4].

Dental surgeons, given the specificity of the care environment, characterized by a high risk of contamination with complex instrumentation and equipment that promotes the spread of infectious agents, are all also exposed to HBV.

There have been reports of viral transmission of 14 surgeons and 9 general dentists and an oral surgeon who transmitted HBV to nearly 55 of his patients [5,6]. In the context of developing countries such as Senegal, contamination could very often be increased mainly because of lack of information, hygiene procedures, asepsis, antisepsis and personal protection. Thus, measures to limit the risk of contamination of patients and odontological practitioners may seem necessary. It is in this perspective that we did a job whose objective was to study the knowledge of dental surgeons against hepatitis B.

Methods

Framework and type of study

The study was conducted nationally and involved surgeons officially serving in a dental office in the country.

The survey was done in collaboration with the College of Dentists and the Ministry of Health of Senegal (Division of Oral Health). Senegal has 338 dental surgeons in 260 dental structures recognized by the Order and the Ministry of Health. Added to this are the cabinets installed in military establishments and other enterprises.

The only region of Dakar has more than 152 dental offices. The study was descriptive and cross-cutting and focused on Senegalese dental surgeons.

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Key words: knowledge, hepatitis b, dentist, Senegal

Published: February 22, 2019

Selection criteria

To be retained in the study, individuals were to be promoted to the rank of doctor in dental surgery, practice or practice dental surgery at the time of the survey, be listed on the boards of the order of the dental surgeons except for the military and agree to participate in the study.

Sample size and sampling

The determination of the size of the sample proceeded from a calculation according to the formula of SCHWARTZ [7]: $n = (\frac{E\alpha}{I})^2 \frac{pq}{I^2}$ which can be used in the transversal studies where E = reduced deviation = 1.96; α = risk of error = 0.05; p = proportion of dental surgeons with no knowledge of hepatitis B. Failing to find a knowledge study, we estimated the prevalence at 10%; q = the complement = 90%; I = accuracy = 5%. These parameters allowed to have a size of 138 individuals. To prevent lost or damaged cards and gain power, we increased the size to 171.

A stratified systematic probabilistic sampling according to Dakar and other regions and by public, private and parapublic firms was carried out.

The first was to draw lots, mainly for material reasons, from seven primary units formed by the regions. From the outset Dakar, the capital was chosen in view of the large concentration of firms (nearly two-thirds of the country's firms). The other six regions were randomly selected by drawing lots across 13 regions. They concerned the regions of Thiès, Ziguinchor, Diourbel, Saint-Louis, Kaolack and Fatick.

Subsequently, secondary units made up of 33 public, 5 parapublic and 109 private firms from the Dakar region were also drawn. For the other regions, the survey enrolled all functional firms at the time of the survey.

Finally, after establishing lists of dental surgeons in the Dakar region as well as in other regions, the statistical units (dental surgeons) were selected according to a systematic random sampling with a sampling rate equal to the size of the population on that of the 'sample.

The rule of proportionality was respected with regard to the distribution of dental surgeons according to whether they were public, semi-public or private and Dakar or other selected regions. In the end, 75 dentists from the private sector and 35 from the public and / or parapublic of the Dakar region; then 45 of the public and / or parapublic and 16 of the private of the other regions were investigated.

Collection of data and variables studied

We administered the questionnaires directly to the dental surgeons selected for the survey.

It should be noted that for dental surgeons in certain regions, we took advantage of a meeting that brought them together in Dakar to administer the questionnaire. Previously, they had been provided with explanations about the objectives and importance of the public health investigation. The survey was conducted from April to June 2014.

The survey form was pre-tested on ten students in a year of dental surgery thesis. This allowed us to observe the reaction of respondents to the survey, to obtain estimates of the time devoted to the different sections. The difficulties and ambiguities encountered were corrected in order to prepare the final investigation.

The information to be collected concerned:

- Socio-demographic characteristics: age, sex, sector of activity, status (generalist, specialist);

- Variables related to knowledge about hepatitis B; knowledge means all relevant information relating to the risk of transmission, elimination and control of HBV.

Ethical considerations

The information contained in the survey card did not identify the dental surgeon who chose to consent or not to answer the questions. The answers were treated confidentially.

Data analysis

The software Epi info 3.4.3 allowed us to enter and process data. The results were expressed as numbers and percentages with their confidence intervals for the qualitative and mean variables followed by their standard deviations for the quantitative variables.

Results

- Distribution of dentists surveyed by socio-professional profile (Table 1)
- Dental Surgeons' Knowledge of Risk Level and Transmission of HBV (Table 2)
- Knowledge of Dental Surgeons on Transmission Fluids, HBV Elimination (Table 3)

Discussion

This study, although it allows us to reach our objectives, could gain more power with a larger size. However, given the size of the population around 400, that of the sample seems satisfactory to highlight a statistical difference. In addition, the multiform nature of probabilistic sampling made it possible to have a representative sample of Senegalese dental surgeons.

Socio-demographic characteristics

More than 67% were male and the average age was 39 years with a standard deviation of 9 years. These results are consistent with those of Diouf et al in 2013 [8], Cissé in 2007 [9] and Mbaye in 2010 [10].

It turns out that there were more dental surgeons in the private sector with more than 4/5 who were general practitioners. This would reflect the reality of the oral health card with a more concentrated professional demographics in the private sector consisting mainly of general dentists. It should be noted that 80% of dentists in Senegal practice in the capital [9].

Risk of HBV related to the wearing or not of gloves or masks

Wearing gloves or masks is a barrier to limit coarse contamination of hands or mucous membranes when contacting body fluids. Gloves should be worn to minimize the risk of transmission of germs

Table 1. Distribution of dentists surveyed by socio-professional profile

Characteristics	Modality	Effective/ Mean (SI)	Percentage (%) [IC]
Age		39(9)	
Gender	Male	115	67.3 [59.7-74.2]
	Female	56	32.7 [25.8-40.3]
Status	General practitioner	145	84.8 [78.5-89.5]
	Specialist	26	15.2 [10.2-21.5]
Sector	Private	98	57.3 [49.5-64.8]
	Public	62	36.3 [29.1-43.9]
	Para-public	11	6.24 [3.3-11.2]

SI: Standard-deviation

Table 2. Dental surgeons' knowledge of risk level and transmission of HBV versus variables

Variables	Level of risk (%) [CI]			
	Any	Low	Medium	High
Wearing glove/mask	5,3 [2,4-9,8]	7,0 [3,7-11,9]	9,9 [5,9-15,4]	77,8 [70,8-83,8]
Touch the instruments	5,8 [2,8-10,5]	14,6 [9,7-20,8]	29,9 [23,1-37,3]	49,7 [42-57,4]
Sting by dirty needle	1,8 [0,4-5]	2,3 [0,6-5,9]	7,6 [4,1-12,6]	88,3 [82,5-92,7]
Patient's bite infected	8,2 [4,6-13,4]	7,6 [4,1-12,7]	32,9 [25,9-40,6]	51,3 [43,4-58,9]
Transmission among:		Existence of a transmission (%) [CI]		
		True	False	Don't know
Pregnancy		41,2 [33,7-49]	27,1 [20,5-34,4]	31,7 [24,8-39,3]
Kissing		76,5 [69,4-82,6]	15,3 [10,2-21,6]	8,2 [4,6-13,4]

Table 3. Means of knowledge of dental surgeons on transmission fluids and means of eliminating HBV

Variables	Modality	Effectives	Proportions (%)
Three main body fluids that can transmit hepatitis B	saliva, sperm, Cerebrospinal fluid	8	4,7 [2,1-9,1]
	blood, urines, tears	5	2,9 [0,4-5,1]
	saliva, blood, genital secretions	158	92,4 [88,7-96,7]
	sperm, breast milk, urines	0	0
Hepatitis B virus can be destroyed by:	Dry heat for 30 minutes	90	52,6 [44,9-60,3]
	70% alcohol	4	2,3 [0,6-5,9]
	Sodium hypochlorite	39	22,8 [16,7-29,8]
	Iodoform	8	4,8 [2-9]
	All the things	30	17,5 [12,2-24,1]

(invasive procedures, mucosal or wound contact) and also to prevent contaminated hands from carrying germs. However, more than 20% of the dentists surveyed considered that the risk of wearing gloves or masks when caring for a patient with HBV was moderate to low or non-existent. In some cases, compliance with the dentist's protection protocol, whether there is a risk or not, becomes a patient's requirement. The Barlean et al. [11] study, which assessed patients' attitudes to the infection control protocol in the dental office, highlighted the patients' demand for the wearing of gloves by the practitioner during treatment (89.2%), masks (61.5%) and goggles (45.5%) in view of the high risk of transmission associated with certain conditions such as hepatitis B.

HBV risk from dirty needle sticks or a contaminated patient's bite

In invasive oral procedures, where the hands of nursing staff, protected by gloves, may come into contact with sharp instruments, needle points or lacerated tissue in a confined anatomical space; in such situations, the dental surgeon is at high risk of involuntary skin injury, whereby the caregiver's blood can come into direct contact with the surgical wound.

More than 4% of the sample considered the needle stick stain to be a low to no risk for contracting hepatitis. Nearly 16% had the same feeling for the bite of an infected patient. These feelings could be translated behaviorally by the non-respect of adequate protective measures with respect to exposure factors.

Transmission of HBV from pregnant woman to her fetus or kissing

If for vertical transmission during pregnancy, 41.2% of dental surgeons did not seem to know the correct answer, it is not the same for kisses where more than ¾ of the sample (76.5%) evoked the possibility of transmission of HBV when one of the individuals was a carrier.

The presence of HBV markers in the cord blood does not constitute evidence of transmission in utero, due to contamination of the cord by the mother's blood during delivery. Indeed, viral DNA has

been detected in fetal hepatocytes examined after abortion without concluding contamination during pregnancy [11,12].

The transmission of the virus is essentially perinatal [13]. At the time of delivery, the child is contaminated during maternal-fetal micro-transfusions that occur during labor by contact with the maternal blood; the virus can enter the body transcutaneously through cutaneous erosions or by swallowing secretions during passage into the genital tract [11,14]. Yet 41.2% of the dental surgeons surveyed found that there was a woman's transmission of HBV to her fetus during pregnancy.

Transmission fluids and means of elimination of HBV

In the literature, the most described transmission fluids are blood, genital secretions (semen, spermine, cervical mucus ...) and to a lesser extent saliva, especially when accompanied by traces of blood. In our study, 92.4% of dentists considered these three fluids to be involved in HBV transmission (Table II). This same trend is confirmed by another study conducted at the Federal University of Piaui (UFPI) in Brazil. It found 98.3% of people who incriminated blood and body fluids [15].

Outside the host, HBV survives in the blood for several weeks, and on surfaces for at least 7 days at 25°C. It is sensitive to many disinfectants: 0.5% sodium hypochlorite, 70% ethanol, 2% glutaraldehyde, formaldehyde. Its stability at 37°C for 60 minutes, 56°C for 30 minutes for years and at -70°C is demonstrated. It is destroyed at a temperature above 60°C. Nearly 18% of dental surgeons considered that HBV could be destroyed by dry heat, 70% alcohol, sodium hypochlorite, and iodoform (Table 2).

Conclusion

The level of knowledge of Senegalese dentists regarding Hepatitis B disease needs to be strengthened. To enable them to fight against any nosocomial infection, it is important to develop awareness and information programs on the different risks of HBV contamination and/or transmission.

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