

Epidemiological aspects of Hepatitis B cases in the state of Pernambuco

Aspectos epidemiológicos dos casos de Hepatite B no estado de Pernambuco

Aspectos epidemiológicos de los casos de Hepatitis B en el Estado de Pernambuco

RESUMO

Objetivo: descrever o perfil epidemiológico dos casos de hepatite B no estado de Pernambuco notificados no Sistema de Informação de Agravos de Notificação. Método: estudo epidemiológico, ecológico, retrospectivo, quantitativo, a partir de dados secundários de notificações dos casos de Hepatite B, do estado de Pernambuco. A população alvo foi composta por todos os casos de hepatite B confirmados no período de 2011 a 2020. Resultados: Houve 6.001 casos de hepatites no estado de Pernambuco, desses, 1.854 (30,89%) foram do tipo B. Houve um maior predomínio de indivíduos do gênero masculino (57,55%), dos 20 aos 39 (45,74%), raça/cor parda (61,00%), de ensino fundamental incompleto (24,16%). As variáveis clínicas mostraram a do tipo crônico (77,40%), modo de transmissão ignorado/branco (66,77%) com a HBsAg reagente (97,79%) e com o AntiHBcIgM não realizado (72,82%). Conclusão: constata-se que a hepatite B ainda apresenta alta prevalência em Pernambuco, também foi evidenciado uma grande deficiência das notificações.

PALAVRAS-CHAVE: Hepatite B; Saúde Pública; Epidemiologia.

ABSTRACT

Objective: to describe the epidemiological profile of cases of hepatitis B in the state of Pernambuco notified in the Notifiable Diseases Information System. Method: epidemiological, ecological, retrospective, quantitative study, based on secondary data from notifications of Hepatitis B cases in the state of Pernambuco. The target population consisted of all cases of hepatitis B confirmed in the period from 2011 to 2020. Results: There were 6,001 cases of hepatitis in the state of Pernambuco, of which 1,854 (30.89%) were type B. There was a greater predominance of males (57.55%), from 20 to 39 (45.74 %), mixed race/color (61.00%), with incomplete primary education (24.16%). The clinical variables showed the chronic type (77.40%), ignored mode of transmission/blank (66.77%) with reagent HBsAg (97.79%) and with AntiHBcIgM not performed (72.82%). Conclusion: it appears that hepatitis B still has a high prevalence in Pernambuco, a great deficiency of notifications was also evidenced.

DESCRIPTORS: Hepatitis B; Public health; Epidemiology.

RESUMEN

Objetivo: describir el perfil epidemiológico de los casos de hepatitis B en el estado de Pernambuco notificados en el Sistema de Información de Enfermedades de Declaración Obligatoria. Material y método: estudio epidemiológico, ecológico, retrospectivo, cuantitativo, basado en datos secundarios de notificaciones de casos de hepatitis B en el estado de Pernambuco. La población objetivo consistió en todos los casos de hepatitis B confirmados entre 2011 y 2020. Resultados: Hubo 6.001 casos de hepatitis en el estado de Pernambuco, de los cuales 1.854 (30,89%) fueron del tipo B. Hubo mayor predominio de hombres (57,55%), entre 20 y 39 años (45,74%), de raza/color pardo (61,00%), con enseñanza primaria incompleta (24,16%). Las variables clínicas mostraron el tipo crónico (77,40%), modo de transmisión ignorado/blanco (66,77%) con HBsAg reactivo (97,79%) y con AntiHBcIgM no realizado (72,82%). Conclusión: La hepatitis B aún tiene alta prevalencia en Pernambuco, y también hubo un déficit significativo en las notificaciones.

PALABRAS CLAVE: Hepatitis B; Salud Pública; Epidemiología.

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Carlos A. L. Filho, Josenildo A. S. Júnior, Andressa B. T. N. de Carvalho, Heloisa M. Campos, Arthur M. e Silva, Ana L. M. dos Santos, Wagner G. Horta, Amanda O. Bernardino, Maria C. C. de Lira.
Epidemiological aspects of hepatitis b cases in the state of pernambuco



Carlos Antonio de Lima Filho

Nursing student at the Federal University of Pernambuco - Academic Center of Vitória (UFPE-CAV)
ORCID: 0000-0001-5517-0347



Josenildo Alves da Silva Júnior

Nursing student at the Federal University of Pernambuco - Academic Center of Vitória (UFPE-CAV)
ORCID: 0009-0008-0337-8590



Andressa Barros Tenório Nunes de Carvalho

Medical student at the Faculty of Medicine of Olinda (FMO)
ORCID: 0009-0007-2828-0963



Heloisa Melo Campos

Student of Medicine at the Faculty of Medical Sciences of Jaboatão dos Guararapes (AFYA)
ORCID: 0009-0009-3426-6054



Arthur de Moraes e Silva

Student of Medicine at the Faculty of Medical Sciences of Jaboatão dos Guararapes (AFYA)
ORCID: 0000-0003-1673-5282



Ana Luiza Melo dos Santos

Student of Medicine at the Faculty of Medical Sciences of Jaboatão dos Guararapes (AFYA)
ORCID: 0009-0009-4260-3612



Wagner Gonçalves Horta

Graduated in Medicine and Physiotherapy from Estácio de Sá University (UNESA). Master in Human and Experimental Biology by the Graduate Program in Human and Experimental Biology at the State University of Rio de Janeiro (UERJ) and PhD in Neurology by the Graduate Program in Neurology at the Federal University of the State of Rio de Janeiro. Adjunct Professor of Neurology at the University of Pernambuco (UPE)
ORCID: 0000-0002-3349-8656



Amanda de Oliveira Bernardino

Graduada em Enfermagem pela Universidade Federal de Pernambuco - Centro Acadêmico de Vitória (UFPE-CAV), Departamento de Enfermagem. Mestre em Enfermagem pelo Programa de Pós-Graduação em Enfermagem da UFPE e Doutora em Enfermagem pelo Programa Associado de Pós-Graduação em Enfermagem da UPE-UEPB
ORCID: 0000-0002-1011-8964



Maria da Conceição Cavalcanti de Lira

Graduated in Nursing from the Higher Education Foundation of Olinda (FUNESO). Master in Environmental Technology from the Pernambuco Institute of Technology (ITEP) and PhD in Pharmaceutical Sciences from the Graduate Program in Pharmaceutical Sciences at the Federal University of Pernambuco (PPGCF-UFPE). Associate Professor at the Federal University of Pernambuco, assigned to the Bachelor's Degree in Nursing at the Academic Center of Vitória (UFPE-CAV)
ORCID: 0000-0001-5788-6728

INTRODUCTION

Hepatitis is a set of viral infections that cause necrosis and consequently inflammation of Kupffer cells, which are specialized macrophages present on the surface of the liver, causing clinical, metabolic and cellular changes in the organ.¹ These infections are caused by a variety of infectious agents, which have in common the tropism for the liver, the main viruses involved are Hepatitis A

(HAV), Hepatitis B (HBV), Hepatitis C (HCV), Hepatitis D (HDV) and Hepatitis E (HEV).^{1,2}

Among the various types of hepatitis, HBV is considered the most serious type, due to its high transmission rates and the possibility of generating chronic liver disease.³ Transmission can occur in several ways, the main ones being unprotected sexual intercourse, skin and/or mucous membrane injuries, blood transfusion and/or blood products, surgical and/or dental procedures, vertical transmission

or by sharing syringes and needles.⁴

The signs and symptoms of HBV are misleading and variable, the main ones being dizziness, tiredness, nausea and vomiting, however, other less common signs such as fever, abdominal pain, jaundice, hepatomegaly and splenomegaly may appear.¹ Authors such as Nicolau et al.¹ state that symptoms tend to appear one to six months after infection with the virus. Diagnosis of the disease is often performed by laboratory tests.

According to the World Health



Organization (WHO), approximately two billion of the world's population have had contact with HBV, among these, about 400 million remain infected by the virus, being considered chronic carriers.⁵ The disease is the tenth cause of death in the world, responsible for about 780,000 deaths annually. In Brazil, it represents the second highest rate of deaths among viral hepatitis.³

Immunity to HBV can happen from two different mechanisms, through previous infection or through vaccination. Vaccination began in the country in the late 1990s, for people under one year old, and from 2013 onwards, the target audience expanded, including people under 49 years old.^{5,6} In this perspective, Taui et al.⁶ states that vaccination was responsible for the reduction in the prevalence of HBV from the 1990s onwards. Vaccination has an efficiency of 90%, however, its performance decreases from the age of forty, even so, a reduction in prevalence is observed in countries that implemented the vaccine properly.⁵

Despite this, according to Santos et al.⁶, in Brazil, the occurrence of HBV varies according to the region, as a result of economic and social conditions, where in the North region there is a high prevalence of the disease, and the Southeast, Midwest and Northeast regions have an intermediate prevalence. Due to its epidemiological importance, in 2002 the Ministry of Health (MH) created the National Viral Hepatitis Program, where Sousa et al.⁷ states that its main objective in its elaboration was based on the creation of guidelines and strategies for the prevention and combat of hepatitis.

The Pan American Health Organization (PAHO) and the WHO have developed strategies for the elimination of HBV as Public Health, the main guidelines were to treat eight million people by the year 2020 and reduce incidence and mortality by 90% and 65%, respectively.⁸ In this logic, Borges et al.³ discusses that epidemiological studies

make an important contribution to assessing the impacts of HBV and the results of control policies.

In view of the above, in association with the silent specificities of HBV and the absence of current research on the prevalence of the disease in the state of Pernambuco, The aim of this study is to describe the epidemiological profile of cases of hepatitis B in the state of Pernambuco notified in the Notifiable Diseases Information System (SINAN).

METHOD

This is an epidemiological, ecological, retrospective, quantitative study, based on secondary data from notifications of Hepatitis B cases in the state of Pernambuco. The target population consisted of all cases of hepatitis B confirmed in the period from 2011 to 2020, in the state of Pernambuco, notified in SINAN, which is a database belonging to the Department of Informatics of the Unified Health System (DATASUS).

According to data from the Brazilian Institute of Geography and Statistics (IBGE), Pernambuco is one of the nine states that form the northeast region of Brazil, comprising 184 municipalities plus the Fernando de Noronha Archipelago, distributed in an area of 98,067,877 km², with a population of 9,058,155 inhabitants.⁹

Data collection took place between June and July 2023, with access to SINAN/DATASUS, available on TabNet (<http://tabnet.datasus.gov.br/>). The variables used to describe the reported cases were: gender, age group, race, education, infection mechanism, clinical form, HBsAg and AntiHBcIgM serology. The distribution of cases during the time frame studied and by age were also analyzed.

At first, the collected data were entered into a database and tabulated, then the relative and absolute frequencies of the variables were calculated and graphs and tables were created using Microsoft Excel and Microsoft Word Versions 2019. Google Scholar, Latin American

and Caribbean Literature in Health Sciences (LILACS), Scientific Electronic Library Online (SciELO) and CAPES Portal de Periódicos databases were used for the bibliographic search.

Because it is a study based on secondary data, with free access, without identifying the participants, it was not necessary to apply informed consent and it was not necessary to submit this study for consideration by a Research Ethics Committee (CEP) involving human beings.

RESULTS

In the period studied, there were 6,001 confirmed cases of hepatitis in the state of Pernambuco, of which 1,854 (30.89%) were caused by HVB. Graph 1 shows the distribution of cases related to HVB in the analyzed period, with an average of about 185 cases per year, the highest percentages occurred in 2019 (15.32%) and 2014 (12.62%), and the lowest in 2015 (6.63%) and 2011 (7.28).

In the distribution of cases by Geres in the State of Pernambuco, shown in Table 1, it can be seen that Geres Recife concentrates a significant portion, corresponding to 70.98% of notifications. Geres Salgueiro was the area with the lowest notification of cases, with 0.59% of notifications.

Table 2 presents the sociodemographic characteristics of the notified cases. A higher prevalence was found in males (57.55%), aged 20-39 (45.74%), followed by 40-59 (39.10%). with a high percentage of brown individuals (61.00%). Regarding education, it was possible to identify a reporting weakness, since 45.31% of cases were reported as unknown/white.

Table 3 shows the clinical characteristics of the notifications. With regard to the infection mechanism, a weakness is noticeable, since there was a high prevalence of cases reported as ignored/blank, in the clinical form variable, acute cases were more prevalent, accounting for 66.77% of notifications. Regarding the performance of serology,

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it is observed that there was confirmation in 97.79% of the cases, unlike the AntiHBCIgM serology, which was not performed in 72.82% of the cases, even so, it is observed that in 20.01% of the cases, it was not reagent.

DISCUSSION

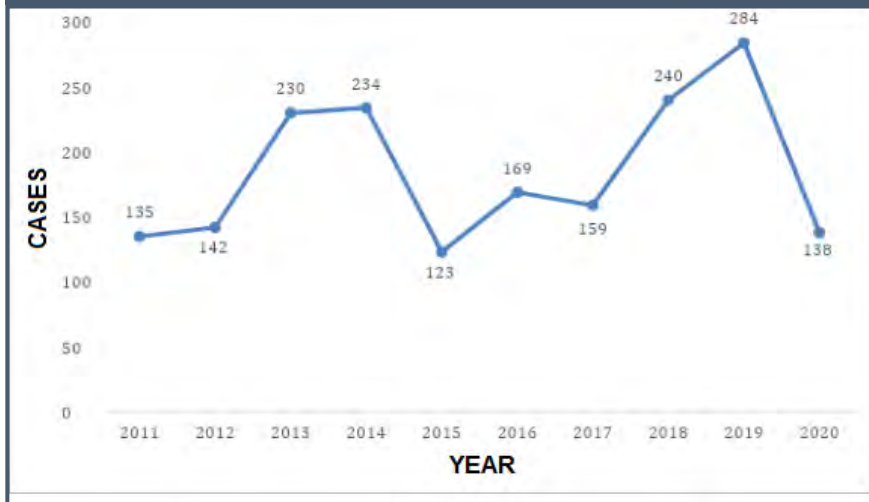
Viral hepatitis is a notifiable disease, therefore, all suspected or confirmed cases of the disease must be notified and registered at SINAN.⁸ The MH points out that about 15% of the population has previous contact with HBV, and about 1.5% are carriers of the chronic form of the disease and are unaware of this condition, which influence the greater spread of the disease.¹⁰

As in other studies, a variation in the prevalence of cases is notorious, with an increase in the years between 2018 and 2019.¹¹ It is clear that despite the growing trend, there is a variation in notifications, with a difference between the years studied, this fact may be associated with underreporting of cases, which happens when the case meets the established criteria and was identified by the health professional, but was not notified to the public health service.¹²

The sharp drop observed in 2020 may in addition be the result of serious underreporting, but also due to the pandemic caused by COVID-19, since Gleriano et al.¹³ states that the pandemic has drastically affected referral services for hepatitis. The highest percentage of cases in Geres Recife is in line with the studies by Ribeiro et al.¹¹, where he reports that a greater notification of cases in large urban centers is mainly due to the resources present in these places, where residents find health services more easily, to carry out routine or preventive exams.

In the identification of cases related to gender, it was seen that males were the most affected compared to females, other studies in the literature are in line with this finding.^{1,3,5,12} Studies point to a higher prevalence of hepatitis, mainly HBV, linked to lifestyle factors more prone to the male gender, such as alcoholism, smoking, injecting drug use and unprotected sex.^{4,10,14} Meanwhile,

Graph 1. Distribution of notified cases of hepatitis B in the state of Pernambuco, from 2011 to 2020



Spource: Authors, 2023. According to data collected from SINAN/DATASUS

Timóteo et al.¹² presents another perspective on this fact, where he says that, for cultural reasons, men seek less health services, thus, many of them rarely have medical appointments or adopt preventive measures, leaving them more exposed to HBV infection.

Regarding the age group, it is shown that, in the time frame under study, the

most affected group was individuals from 20 to 39 years old, followed by 40 to 59 years old, data also similar to the results of the research by Mendes et al.¹⁴ and Luz et al.¹⁵ HBV affects more individuals in this age group, presumably due to transfusional transmission and mainly through sexual transmission, where individuals in this age

Table 1. Distribution of notified cases of hepatitis B in the state of Pernambuco, by Regional Health Management

GERES	CASES	%
I RECIFE	1.316	70,98
II LIMOEIRO	86	4,64
III PALMARES	79	4,26
IV CARUARU	108	5,83
V GARANHUS	29	1,56
VI ARCOVERDE	39	2,10
VII SALGUEIRO	11	0,59
VIII PETROLINA	53	2,86
IX OURICURI	19	1,02
X AFOGADOS DA INGAZEIRA	13	0,70
XI SERRA TALHADA	19	1,02
XII GOIANA	82	4,42
TOTAL	1.854	100

Spource: Authors, 2023. According to data collected from SINAN/DATASUS



Table 2. Distribution of reported hepatitis B cases in the state of Pernambuco, according to sociodemographic data

GENDER	CASES	%
MALE	1.067	57,55
FEMALE	787	42,45
AGE GROUP	CASES	%
<1	19	1,02
1-4	3	0,16
5-9	2	0,11
10-14	4	0,22
15-19	36	1,94
20-39	848	45,74
40-59	725	39,10
60-69	141	7,61
70<	76	4,10
RACE/COLOR	CASES	%
IGNORED/BLANK	334	18,02
WHITE	223	12,03
BLACK	152	8,20
YELLOW	8	0,43
BROWN	1.131	61,00
INDIGENOUS	6	0,32
EDUCATION	CASES	%
IGNORED/BLANK	840	45,31
ILLITERATE	59	3,18
INCOMPLETE ELEMENTARY SCHOOL	448	24,16
COMPLETE ELEMENTARY SCHOOL	81	4,37
INCOMPLETE HIGH SCHOOL	82	4,42
COMPLETE HIGH SCHOOL	245	13,21
COMPLETE HIGHER EDUCATION	31	1,67
COMPLETE HIGHER EDUCATION	46	2,48
DOESN'T APPLY	22	1,19
TOTAL	1.854	100

Spource: Authors, 2023. According to data collected from SINAN/DATASUS

group have an active sex life, evidenced by high rates in reproductive age.^{1,16}

This characteristic may also be linked to vaccine delay, where Santos et al.⁵ reports that since vaccination started in 1998 only covered people younger than one year, these individuals were not vaccinated when they were children, adolescents or young adults, making them more susceptible to HBV today. Despite having a low prevalence compared to other age groups, children and adolescents have a high risk of contracting HBV, especially those who live with high rates of social vulnerability, requiring firm action by vaccination programs in schools and the proper conclusion of the vaccination schedule.¹⁰

In identifying race/color, it was seen that, as in the research by Agostinho et al.¹⁷ and Luz et al.¹⁵, a higher prevalence in brown individuals, but other studies available in the literature point to a higher prevalence in white individuals, such as that by Mendes et al.¹⁴ The 2022 Epidemiological Bulletin of Viral Hepatitis showed that, a minimal majority, about 40.4% of HBV cases in Brazil were in self-declared brown individuals, followed by whites, with 37.6% of cases.¹⁸

A high increase in the proportion of HBV was observed in self-declared brown individuals, from 8.5% in 2000 to 39.1% in 2012, the literature does not indicate a biological issue for this characteristic, even so, some studies indicate that this fact may be associated with the precarious living conditions that affect this population group.^{5,15,17,18}

Regarding the schooling variable, Santos et al.⁵ reports that it is an important epidemiological indicator, serving as a tool for assessing the socio-economic condition of the studied population, in which the lowest levels of education are associated with the poorest social levels. In the present study, data demonstrate that most cases were reported as ignored/blank, a characteristic also present in other studies carried out in Brazil.^{15,18}

Analyzing only the level of education

Table 3. Distribution of reported hepatitis B cases in the state of Pernambuco, according to clinical data

MECHANISM OF INFECTION	CASES	%
IGNORED/BLANK	1.435	77,40
SEXUAL	267	14,40
TRANSFUSIONAL	18	0,97
INJECTION DRUG USE	9	0,49
VERTICAL	2	0,11
WORK ACCIDENT	8	0,43
HEMODIALYSIS	3	0,16
DOMICILIARY	20	1,08
SURGICAL TREATMENT	9	0,49
DENTAL TREATMENT	38	2,05
PEOPLE/PEOPLE	11	0,59
FOOD/WATER	6	0,32
OTHERS	28	1,51
CLINICAL FORM	CASES	%
IGNORED/BLANK	54	2,91
ACUTE HEPATITIS	438	23,62
CHRONIC/CARRIER HEPATITIS	1.238	66,77
FULMINANT HEPATITIS	2	0,11
INCONCLUSIVE	122	6,58
HBsAg SEROLOGY	CASES	%
REAGENT	1.813	97,79
NON REAGENT	17	0,92
INCONCLUSIVE	1	0,05
NOT PERFORMED	23	1,24
AntiHBcIgM SEROLOGY	CASES	%
REAGENT	120	6,47
NON REAGENT	371	20,01
INCONCLUSIVE	13	0,70
NOT PERFORMED	1.350	72,82
TOTAL	1.854	100

Source: Authors, 2023. According to data collected from SINAN/DATASUS

of the individuals, it was observed that, as in the research by Luz et al.¹⁵, a higher prevalence of individuals with incomplete primary education. The low socioeconomic and cultural level of the population influences their understanding of the health-disease process and quality of life, thus, in this perspective, it is clear that individuals with lower education have a certain lack of information about Sexually Transmitted Infections (STIs), and how to prevent them, this characteristic being crucial factors for the prevalence of diseases such as HBV.⁵

With regard to the infection mechanism, a marked reporting failure is noticeable, where most cases were reported as ignored/blank, a situation also found nationwide, reaching a total of almost 60% of notifications, however, this situation becomes more alarming in the present study, reaching almost 80%.¹⁷

Although, sexual transmission has a certain prevalence compared to the others, as also present in the studies by Borges et al.³ and Agostinho et al.¹⁷, when associated with the aforementioned information, and the fact that other studies, such as Cerqueira et al.¹⁹ present that drug use was the most frequent mechanism, it is noticeable that it is not possible to faithfully assess the main mechanism of infection in the state of Pernambuco. Authors such as Agostinho et al.¹⁷ points out that a higher rate of sexual transmission may be associated with the high rates of cases in men, a characteristic present in the current study.

HBV is one of the main STIs present in the country.¹⁰ The individual's autonomy can aggravate risk behaviors for HBV, mainly, the early onset of sexual activity, sharing objects and intimate intercourse without a condom, it is important to recognize that the work of health professionals regarding sex education needs to overcome stigmas and prejudices related to the heteronormative conceptions imposed by society, in order to single out health care, and raise awareness about STIs.^{3,10}

Regarding the clinical form, the most

common was HBV in its chronic form, as well as in the study by Evangelista et al.²⁰ Soon after the infection, an intense viral replication occurs, which characterizes the acute phase of the disease, who may or may not have symptoms, at this stage the Hepatitis B Surface Antigen (HBsAg) is already detected in the body, after 6 months it is replaced by the Antibody against the surface antigen of Hepatitis B (AntiHBcIgM), if there is persistence of HBsAg for more than 6 months, a chronic condition of the disease is configured. According to Gomes et al.²¹ the younger the individual is exposed to HBV, the greater the risk of progressing to the chronic phase of the disease, due to the immaturity of the immune system.

According to Timóteo et al.¹², nationally about 77% of cases of hepatitis are diagnosed in the chronic phase, since many cases are asymptomatic, causing individuals to seek medical assistance only in the chronic phase. Luz et al.¹⁵ points out that currently the chronic phase of the disease has no cure. To contain the evolution of the chronic form of HBV, an early diagnosis and adequate treatment are necessary in the early stages.¹⁵

HBsAg is the protein present on the surface of HBV viruses, while AntiHBcIgM is associated with the recovery of immunity, also found in individuals who have been immunized against the disease. According to Silva et al.²² in a study carried out in Acre, found that the reactivity of HBsAg and AntiHBcIgM was related to alcohol abuse, male gender, older age group, presence of tattoos and previous surgery. The diagnosis is carried out mainly through the rapid test and laboratory examination, the diagnosis is based mainly on the analysis of HBsAg and AntiHBcIgM.

As main limitations of the present study, possible failures in the reporting of cases were observed, due to the high prevalence of cases reported as "ignored/blank", which made it difficult to efficiently analyze some variables, as well as the fact that this is a study with

secondary data, which are prone to reporting errors. Despite this, the data presented proved to be an important HBV tool in Pernambuco, which still has scarce information about the condition in the state.

CONCLUSION

The present study demonstrated that HBV is still a serious public health pro-

blem in the state of Pernambuco, from the analyzed data, it was observed a growing trend of notification of cases, with a prevalence of cases in men, in young adult individuals, of brown race, with varied education. Clinical variables demonstrated high prevalence of chronic cases, HBsAg serology reactive, and AntiHBcIgM serology not performed, with a large number of infection mechanisms reported as ignored and/or blank.

The present work presents the perspective of contributing to the elaboration and improvement of public policies aimed at HBV control, mainly in the identification of individuals more exposed to the condition, underreporting and reporting problems are important limitations. It is expected that the results obtained will serve to contribute to the survey of new research on the condition, mainly in relation to the study of the infection mechanism.

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