

EPIDEMIOLOGICAL PROFILE OF PATIENTS WITH HEPATITIS B IN RIO VERDE - GO, FROM 2013 TO 2022

Genecy Alves Moreira Neto

Universidade de Rio Verde, Brazil

Rio Verde, Goiás

<https://orcid.org/0009-0007-6671-2747>

<https://lattes.cnpq.br/6773973128357398>

Maria Clara Tassara Gomes

Universidade de Rio Verde, Brazil

Aparecida de Goiânia, extensão Goiânia,
Goiás

<https://orcid.org/0009-0008-8625-8200>

<http://lattes.cnpq.br/4916222516760814>

Patricia Naves Silva

Universidade de Rio Verde, Brazil

Aparecida de Goiânia, extensão Goiânia,
Goiás

<https://orcid.org/0009-0008-8625-8200>

<http://lattes.cnpq.br/3405571652302443>

Luiza Siqueira Mota

Universidade de Rio Verde, Brazil

Rio Verde, Goiás

<https://orcid.org/0009-0001-6905-503X>

<http://lattes.cnpq.br/0781149997858787>

Larissa Molinari Alves de Oliveira

Universidade de Rio Verde, Brazil

Rio Verde, Goiás

<https://orcid.org/0009-0002-7186-6170>

<http://lattes.cnpq.br/3670981709259170>

All content in this magazine is licensed under a Creative Commons Attribution License. Attribution-Non-Commercial-Non-Derivatives 4.0 International (CC BY-NC-ND 4.0).



João Paulo Teixeira Gomes

Universidade de Rio Verde, Brazil
Goianésia, Goiás
<https://orcid.org/0009-0004-7031-5128>
<http://lattes.cnpq.br/6791291302399672>

Ana Beatriz Mota de Carvalho

Faculdade Zarns, Brazil
Itumbiara, Goiás
<https://orcid.org/0009-0000-3087-6191>
<https://lattes.cnpq.br/7612356096708886>

Vitória Fernandes da Silva

Faculdade Zarns, Brazil
Itumbiara, Goiás
<https://orcid.org/0009-0007-5046-7265>
<http://lattes.cnpq.br/2501543075897772>

Thamires Guizzetti

Faculdade Zarns, Brazil
Itumbiara, Goiás
<https://orcid.org/0009-0003-9269-6139>
<https://lattes.cnpq.br/2924450679647412>

Gabriella Guizzetti

Faculdade Zarns, Brazil
Itumbiara, Goiás
<https://orcid.org/0009-0005-2367-8548>
<http://lattes.cnpq.br/0665287597271292>

Denise Glória Silva de Paula da Costa

Faculdade Zarns, Brazil
Itumbiara, Goiás
<https://orcid.org/0000-0003-4457-7824>
<https://lattes.cnpq.br/7489214851505429>

Larissa de Sá Santos

UniAtenas, Brazil
Paracatu, Minas Gerais
<https://orcid.org/0009-0005-1009-9678>
<http://lattes.cnpq.br/1944494438944401>

Abstract: Objectives: discuss the epidemiological profile of patients with Hepatitis B in the city of Rio Verde - Goiás, analyze causes and consequences of the evolution and worsening of the disease and the incidence of adherence and importance given to prevention against viral infection. Methods: analytical cross-sectional study, with a quantitative approach to the epidemiological profile of patients with Hepatitis B in Rio Verde-GO, using the SUS IT Department (DATASUS) for data collection from 2013 to 2022. It was not necessary to submit the work to the Research Ethics Committee (CEP) as it is a study that does not involve human beings. Results: A total of 84,863 patients were registered with the presence of ANTI-HBS, ANTI-HBE, ANTI-HBC-TOTAL, HSAG, HBEAG and, histopathology, PCR and immunohistochemistry, to identify the hepatitis B virus. Conclusion: there was a progressive increase in the disease infection rate due to seropositivity of certain antibodies to the disease and antigens of the B virus in the period from 2013 to 2022. In 2019 there was a rapid increase in contagion, which may indicate a deficient immune system and low vaccination coverage among the population. There is misinformation and poor awareness among individuals regarding the severity and importance of immunization against the disease. Expanding vaccination, computerization and strengthening therapies leads to a reduction in disease rates.

Keywords: Liver, Infection, Contagion, Immunization

INTRODUCTION

Information contained in Chinese literature already referred to the occurrence of jaundice in its population more than five thousand years ago. There have been reports of outbreaks of epidemic jaundice in China for more than 5,000 years and around 2,500 years ago the

Babylonians already made references to these outbreaks among their people, and as early as the 4th century BC, Hippocrates also reported cases of epidemic jaundice, without any idea of causal agent or forms of transmissibility. Thus, for many years, hepatitis remained an unknown for doctors, until in 1865, Virchow described a patient with jaundice, who presented obstruction of the terminal bile duct by a mucus plug, and thus the concept of “catarrhal jaundice” emerged. which has been perpetuated over many generations. (FONSECA, 2010; PARANÁ, 2003)

In the 1960s, Baruch Blumberg, winner of the Nobel Prize for Medicine in 1976, discovered an antigen in the serum of an Australian aboriginal that reacted with the serum of two transfused hemophiliac patients, which was given the name Australia antigen (AgAu). This occasional finding represented a milestone in the study of viral hepatitis. For some years, Blumberg and his team suggested that the high frequency of this antigen in the serum of patients with acute hepatitis could be related to a supposed virus introduced between humans through blood transfusions. This thought was not initially approved by the community, but after intense review it ended up being accepted among the reviewers. Virus B was the first human pathogenic virus to be sequenced. By obtaining such information, together with knowledge of its form of transmission, strategies to prevent the spread of this virus were developed and resulted in a major impact on the evolution of cirrhosis and hepatocellular carcinoma. (PARANÁ, 2003);

Previously, it was established that hepatitis is a condition of liver degeneration. This disease has several variations, including hepatitis A, B, C, D and E, which are related to specific causes. From this perspective, it is seen that hepatitis can originate from infection with hepatotropic viruses, or from excessive use of medicines and other drugs,

in addition to alcohol consumption and autoimmune, metabolic and genetic diseases. These infections cause, annually, more than 1.34 million deaths globally, of which 66% are caused by Hepatitis B. This article will cover the main epidemiological information about hepatitis B, in Rio Verde - GO, from the forms of prevention, causes, symptoms, diagnosis and treatment. (ZOLIN, 2023; DUARTE, 2021)

Hepatitis B is caused by the B virus, also called HBV. Once inside the human body, the virus attacks hepatocytes (liver cells) and begins to multiply, leading to inflammation and damage to the organ. Added to this is the fact that it is a sexually transmitted disease and that if the infection is persistent, it can result in problems such as cirrhosis, liver failure and hepatocellular carcinoma. As the B virus, which causes the disease, is present in blood, sperm and breast milk, hepatitis B is considered a sexually transmitted infection (STI). (GONSALEZ, 2023; FERREIRA, 2000; ZOLIN, 2023). In this context, it is worth highlighting that hepatitis B has two types, which differ according to their two evolutionary phases:

ACUTE HEPATITIS B

The acute phase of hepatitis B infection can last up to six months. Your immune system is probably capable of defending itself against acute hepatitis B and you should recover completely within these six months. Furthermore, it is seen that the majority of adults who become infected with the hepatitis B virus do not develop symptoms at this stage of the disease. However, the inability to eliminate the HBV virus within these six months takes the patient into the chronic phase of the disease. (GONSALEZ, 2023)

CHRONIC HEPATITIS B

The chronic phase of the disease can last years or the entire life of the individual who was unable to eliminate HBV in the initial six months of the disease. This occurs when the patient's immune system cannot fight the infection. The chronicity of the disease can lead to liver cirrhosis and liver cancer (hepatocarcinoma). It is estimated that the risk of developing hepatocellular carcinoma is 100 times greater among HBV carriers compared to those without the virus, and that 15-20% of those with HBV may die prematurely. From this perspective, it is worth highlighting that the risk of the disease becoming chronic hepatitis B depends on the age at which contamination occurs. Children are the most affected. In those less than a year old, this risk reaches 90%; between one and five years, it varies between 30% and 50%. In adults, the rate drops to 5% to 10%. (GONSALEZ, 2023; FERREIRA, 2006; FERREIRA, 2004)

It is estimated that approximately two billion individuals have past or present serological evidence of Hepatitis B Virus (HBV) infection and that chronic infection affects approximately 350 million people worldwide, representing an important public health problem. Evolution can occur symptomatically or asymptotically, being the main cause of Liver Cirrhosis and Hepatocellular Carcinoma (HCC), which results in approximately 500,000-1,200,000 deaths per year. (LIMA, 2023)

Regarding the diagnosis of hepatitis B, it has been demonstrated that Paul Erlich Institute IgM anti-HBc levels >4 IU are diagnostic for the presence of chronic hepatitis B and can be the diagnostic tool to differentiate the inactive carrier without liver disease from anti-HBe positive patients observed in a phase of low HBV replication (BONINO, 2003). Furthermore, it can be done by carrying out a blood test to evaluate liver function and detect

the presence of HBV in the circulation, as well as its quantity, these data being important so that the doctor can recommend treatment. The condition is confirmed if there are high levels of transaminases, ALT, AST, alkaline phosphatase, gamma GT and bilirubin. Elevated transaminases characterize the condition of acute hepatitis, and serological markers are used to identify the type of hepatitis:

Antibody to HBsAg (AntiHBs): a positive result means that the person was infected and eliminated the virus, or was vaccinated against hepatitis B.

Antibodies to hepatitis B antigen (Anti-HBc): a positive result means that you have had contact with the virus, recently or in the past.

Antibodies to hepatitis B core antigen of the IgM class (Anti-HBc IgM): a positive or reactive result indicates a recent acute infection.

Hepatitis B surface antigen (HBsAg): A positive result means the person carries the B virus.

Hepatitis E surface antigen (HBeAg): a positive result means that there is hepatitis B infection and that this person is more likely to pass the infection to other people, as the virus is multiplying. (GONSALEZ, 2023)

Liver biopsy can also be used to assist in diagnosis, assess liver involvement, assess the evolution of the inflammatory process and fibrosis, the need for treatment and serves as an important risk factor for the progression of cirrhosis. (FERREIRA, 2000; BURNS, 2014). Regarding treatment, it varies according to the stage of the disease, with acute hepatitis recommending rest, hydration and dietary care, while in chronic hepatitis treatment is normally carried out with medicines prescribed by a hepatologist, infectious disease specialist or general practitioner. (HINRICHSEN, 2024). Furthermore, the

hepatitis B vaccine is the best way to prevent infection. The hepatitis B vaccine is safe and effective and is usually given in 3-4 doses over a 6-month period. (GONSALEZ, 2023) After receiving three doses, the hepatitis B vaccine provides more than 90% protection to babies, children and adults immunized before being exposed to the virus. Thus, the Hepatitis B vaccination schedule is for:

- All children should receive the first dose of hepatitis B vaccine at birth and must complete the series of three vaccines by the age of six months
- Young people under 19 who have not been vaccinated should update their vaccinations
- People at high risk of contamination, including healthcare professionals and those who live with someone who has hepatitis B, need to be vaccinated
- Newborns whose mothers are infected with hepatitis B should receive a special immunization, which includes hepatitis B immune globulin and hepatitis B vaccination within the first 72 hours of life
- Screening all donated blood has reduced the chances of hepatitis B contamination in blood transfusions. Mandatory disease notification allows healthcare professionals to track people who have been exposed to the virus. The vaccine is given to those who have not yet developed the disease
- Hepatitis B vaccine or immunoglobulin (HBIG) can help prevent infection if given within 72 hours of exposure
- The hepatitis B vaccine is not recommended for people who have had serious allergic reactions to a previous dose of the hepatitis B vaccine or any part of the vaccine
- Furthermore, it is not recommended for anyone who is allergic to yeast because

yeast is used when making the vaccine. Tell your doctor if you have any serious allergies. And the possible complications of hepatitis B, if left untreated, include:

- Cirrhosis: cirrhosis opens wounds inside the liver, which can lead to organ failure
- Liver cancer: liver cancer results in tumors in the organ and may require surgery
- Liver failure: in these cases, the only viable alternative is transplant (GONSALEZ, 2023)

GOALS

The objective of the article is to discuss the epidemiological profile of patients with Hepatitis B in the city of Rio Verde - Goiás, analyze the causes and consequences of the evolution and worsening of the disease and the incidence of adherence and importance given to prevention against viral infection.

METHODS

The study model selected was analytical cross-sectional, with a quantitative approach to the epidemiological profile of patients with Hepatitis B in Rio Verde-GO. In this way, data obtained from information platforms such as the SUS Information Technology Department (DATASUS) were collected, which had as an outcome of interest to transmit and disseminate data on the topic between the years 2013 to 2022, portraying incidence and prevalence rates on the number of patients with positive serology for the Hepatitis B virus, based on the presence of antibodies against the surface antigen of the Hepatitis B virus (ANTI-HBS), antibodies against antigen and the hepatitis B virus (ANTI-HBE), IGG and IGM antibodies against Hepatitis B core antigen (ANTI-HBC-TOTAL), IGM antibodies against Hepatitis B virus core antigen, Hepatitis B virus surface antigen (HBSAG), hepatitis virus antigen

and B (HBEAG), histopathology, PCR (quantitative) and immunohistochemical methods for identifying the hepatitis B virus.

For the research, the guidelines and regulatory standards contained in Resolution 466/2012 and 510/2016 of the National Health Council were respected and the researchers cited the authors employed in the study and the data was used only for scientific purposes. As this is a study using secondary data and does not involve human beings, it was not necessary to submit the work for consideration by the Research Ethics Committee (CEP).

RESULTS AND DISCUSSION

A total of 84,863 patients were registered with the presence of antibodies against the surface antigen of the Hepatitis B virus (ANTI-HBS), antibodies against the antigen and hepatitis B virus (ANTI-HBE), IGG and IGM antibodies against the central antigen of Hepatitis B (ANTI-HBC-TOTAL), IGM antibodies against Hepatitis B virus core antigen, Hepatitis B virus surface antigen (HBSAG), hepatitis B virus antigen (HBEAG), histopathology, method PCR (quantitative) and immunohistochemistry for identification of the hepatitis B virus during the years 2013 to 2022 in the city of Rio Verde - GO, as shown in figure 1. The year with the greatest predominance of antibodies and antigens for the virus was 2019 (15,361), followed by 2021 (14,790).

This data on the progressive increase in the disease directly correlates with what the Ministry of Health states in 2023 that HBV infection is one of the most common infections in the world, estimated to have infected more than 257 million people and to have caused more than 900 thousand deaths worldwide in 2015.

In the municipality, a total of 13,369 infected patients were identified (figure 2) with the presence of antibodies against the surface

antigen of the hepatitis B virus (ANTI-HBS), with the last year of analysis, 2022, being the year of greatest responsiveness, demonstrating that the number of contagions, elimination of the virus and the rate of immunization against HBV have increased progressively over the years. C.T. Ferreira, 2004 describes the indication of anti-HBS vaccination for immunocompromised people and health professionals, which can certainly explain the continuous increase in immunization and, consequently, the increase in ANTI-HBS.

Furthermore, 867 patients with the presence of hepatitis B antigen and virus (HBEAG) were identified, with 2020 being the year of highest prevalence, with 286 cases (figure 3). This result demonstrates that there was a variably significant improvement in the infection rate, since a constant increase in viral antigen was recorded in patients until 2020, and after this year, a considerable reduction was obtained (84 in 2021 and 119 in 2022), it can be inferred that there was a wider and more widespread immunization against HBV among the population in the last two years of analysis, leading to a reduction in HBEAG.

Regarding the presence of IGG and IGM antibodies against the central antigen of the hepatitis B virus (ANTI-HBC-TOTAL), a total of 24,200 positives were obtained (figure 4), identifying the highest prevalence in 2019, with 5,005 seropositives, followed by the last two years of analysis, 2021 (4,643 positives) and 2022 (4,108 positives).

In addition, research into the presence of antibodies against antigens and the hepatitis B virus (ANTI-HBE) in patients (figure 5) indicated a higher incidence in 2022, with 192 individuals with positive serology in the municipality and later in 2019, with 121 seropositive patients. As a result of this linear increase in individuals with the antibody present, it can be seen that there was a higher incidence of the disease and adherence to

Approved quantity per year of processing, according to the municipality
 City: Rio Verde
 Procedure: 020203636 – Survey on antibodies against hepatitis B virus surface antigen, 0202030844, Survey on hepatitis B virus antigen and antibodies (ANTI-HBE), 020203784, Survey on IGG and IGM antibodies against hepatitis B virus core antigen (Anti -HBC-total), 020203890, research on IGM antibodies against hepatitis B virus core antigen (anti-hbc-igm), 020203970, research on hepatitis B virus surface antigen (HBSAG), 020203989, research on antigen and of hepatitis B virus (HBEAG), 02130135, histopathology for identification of hepatitis B, 0212010208, identification of hepatitis B virus by PCR (quantitative), 0213010356, immunohistochemistry for identification of hepatitis B. Period: 2013 - 2022

City	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total
TOTAL	6.883	5.358	2.013	2.286	3.210	9.124	15.361	11.225	14.790	14.613	84.863
521880 RIO VERDE	6.883	5.358	2.013	2.286	3.210	9.124	15.361	11.225	14.790	14.613	84.863

Source: Ministry of Health – S.U.S. outpatient information system (Unified Health System)

Figure 1. Comparison of the incidence of antibodies and antigens to HBV over the years

Source: DATASUS

Approved quantity per year of processing, according to the municipality
 City: Rio Verde
 Procedure: 020203636 – Research on antibodies against hepatitis B virus surface antigen.
 Period: 2013 - 2022

City	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total
TOTAL	1.771	891	512	326	740	1.607	1.654	1.286	2.072	2.510	13.369
521880 RIO VERDE	1.771	891	512	326	740	1.607	1.654	1.286	2.072	2.510	13.369

Source: Ministry of Health – S.U.S. outpatient information system (Unified Health System)

Figure 2. Incidence of ANTI-HBS infection in patients over the years

Source: DATASUS

Approved quantity per year of processing, according to the municipality
 City: Rio Verde
 Procedure: 020203989 – Research on antigen and hepatitis B virus.
 Period: 2013 - 2022

City	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total
TOTAL	37	38	63	9	57	60	114	286	84	119	867
521880 RIO VERDE	37	38	63	9	57	60	114	286	84	119	867

Source: Ministry of Health – S.U.S. outpatient information system (Unified Health System)

Figure 3. Incidence of HBEAG in individuals over the years

Source: DATASUS

Approved quantity per year of processing, according to the municipality
 City: Rio Verde
 Procedure: 0202030784 – Research on IGG and IGM antibodies against the central antigen of the hepatitis B virus.
 Period: 2013 - 2022

City	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total
TOTAL	2.037	1.707	293	344	835	1.785	5.005	3.432	4.654	4.108	24.200
521880 RIO VERDE	2.037	1.707	293	344	835	1.785	5.005	3.432	4.654	4.108	24.200

Source: Ministry of Health – S.U.S. outpatient information system (Unified Health System)

Figure 4. Incidence of ANTI-HBC-TOTAL in individuals over the years

Source: DATASUS

immunization by the population.

In addition, a total of 5,111 patients were seropositive for IgM antibodies against hepatitis B virus central antigen (ANTI-HBC-IGM) (figure 6) and were identified at a higher prevalence in 2018, with 903 patients positive for the antibody, followed by 2019 with 786 positives. However, in subsequent years, 2020 and 2022, there was a sudden reduction in cases, with 414 and 243 cases, respectively, demonstrating that, in line with the increase in the number of cases, there was an increase in the chronicity of the disease among individuals in recent years. years, since seropositive for the IgM antibody indicates the presence of recent acute infection.

Regarding seropositivity to the surface antigen of the hepatitis B virus (HBSAG) (figure 7), there was a total of 40,690 individuals carrying the B virus in the municipality between 2013 and 2022, with the highest prevalence in the last year, with 7,441 and the lowest in 2017, with 1,044 infected individuals.

The progressive increase in seropositivity to the surface antigen of the Hepatitis B virus (HBSAG) indicates that there has been an increase in the viral load in individuals, which can be correlated with a poor adherence of the population to immunization against the virus. Furthermore, the promotion of this health gap is certainly due to a low level of encouragement and awareness on the part of professionals about the importance of vaccination for the production of antibodies to combat viral infection. Thus, this low population implementation reflects the higher rate of infection with the disease, which is generally asymptomatic at first, and the individual comes to be diagnosed decades after infection, as this is when the disease in an advanced and chronic phase manifests symptom linked to liver dysfunction, such as nausea, vomiting, fever, abdominal pain,

ocular and skin jaundice (Min. da Saúde, 2023).

In addition to this, it is important to highlight that the virus presents hepatotropism, which allows it to bind to the cell surface, internalize, lose its envelope, reach the nucleus and reproduce in a similar way to the retrovirus, which can evolve into a disease. advanced liver disease, which occurs in many cases of individuals with the presence of the hepatitis B virus and antigen (HBEAG), with spontaneous cure in adults exposed to HBV occurring in around 90%. The persistence of the virus or the presence of the HBV surface antigen (HBsAg) in serological tests for more than six months characterizes the evolution to the chronic phase (Min. Saúde, Prot Cli. Dir. Ter. Hep B. Coinf, 2017) and at the heart of HBEAG, when analyzing figure 3, it is seen that there was a sudden reduction in 2020, with 286 seropositives, and 2021, with 84 seropositives, which may indicate an improvement in the immunological response of individuals and a significant reduction in the risk of progressing to the chronic phase, with seropositive tests in more than a semester. However, there was an increase in the population in 2022, with 119 seropositives, demonstrating greater infectivity and probable regression to broad immunization.

In figure 4, when investigating the presence of IGG and IGM antibodies against the central antigen of the hepatitis B virus (ANTI-HBC-TOTAL) in the population of Rio Verde-Goiás, it is clear that the incidence of acute infection (by positive IgM and negative IgG) and chronic (positive IgG and negative IgM) of the virus had its peak in 2019, with 5,005 seropositives, followed by the last two years of analysis, 2021 (4,643 positives) and 2022 (4,108 positives), representing that there was a relative reduction in 2020, with 3,432 cases, however, infection in the area increased in subsequent years. The data in this table is

S.U.S. outpatient production (Unified Health System) – GOIAS – By service location Approved quantity per year of processing, according to the municipality City: Rio Verde Procedure: 02020306444 – Research on antibodies against antigen and hepatitis virus Period: 2013 - 2022												
City	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total	
TOTAL	18	8	7	6	25	62	121	85	102	192	626	
521880 RIO VERDE	18	8	7	6	25	62	121	85	102	192	626	

Source: Ministry of Health – S.U.S. outpatient information system (Unified Health System)

Figure 5. Incidence of ANTI-HBE in individuals over the years

Source: DATASUS

Approved quantity per year of processing, according to the municipality City: Rio Verde Procedure: 020203890 – Research on IGM antibodies against the central antigen of the hepatitis B virus (Anti-hbc-igm) – Period: 2013 - 2022											
TOTAL	478	531	280	242	509	903	786	414	725	243	5.111
521880 RIO VERDE	478	531	280	242	509	903	786	414	725	243	5.111

Source: Ministry of Health – S.U.S. outpatient information system (Unified Health System)

Figure 6. Incidence of ANTI-HBC-IGM in patients over the years

Source: DATASUS

Approved quantity per year of processing, according to the municipality City: Rio Verde Procedure: 020203970 – Hepatitis B Virus Surface Antigen (HBSAG) Research Period: 2013 - 2022											
Município	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total
TOTAL	2.542	2.183	858	1.359	1.044	4.707	7.681	5.722	7.153	7.441	40.690
521880 RIO VERDE	2.542	2.183	858	1.359	1.044	4.707	7.681	5.722	7.153	7.441	40.690

Source: Ministry of Health – S.U.S. outpatient information system (Unified Health System)

Figure 7. Incidence of HSAG in individuals over the years

Source: DATASUS

limited and unfortunately cannot indicate quantitative differences in the rates of acute and chronic infection.

Linked to the presence of antibodies against antigens and the hepatitis B virus (ANTI-HBE), a total of 626 seropositive individuals were obtained, and the highest incidence was in 2022, with 192 individuals with positive serology in the municipality and subsequently 2019, with 121 HIV-positive patients. This result allows us to understand that there was a reduction in vaccination coverage in 2020 and 2021, which, in fact, contributed to the increase in the incidence of the disease in 2022 and, consequently, greater

adherence to vaccination by the population in the year.

Furthermore, it is extremely important regarding its chronicity, characterized by the persistence of the virus for more than 6 months, and related problems, when evaluating in figure 6, the significant reduction in IgM antibodies against the central antigens of the Hepatitis B virus (ANTI- HBC-IGM) over the years, which demonstrate the recent presence of infection in the acute phase. Lok and McMahon, 2007, estimate that approximately 350 million individuals worldwide have chronic infection with the hepatitis B virus, who are at greater risk of developing

hepatocellular carcinoma (HCC) and liver cirrhosis, which may progress to organ failure. Therefore, its increasing chronicity is certainly due to the deficit of antibodies in the acute phase, being unable to combat the virus in the initial phase of the disease.

In connection with the hepatitis B virus surface antigen (HBSAG), of the 40,690 carriers (figure 7), 7,441 manifested the infection in the last year, 2022, 7,153 positives in 2021, 5,722 positives in 2020 and 7,681 positives in 2019, making up the higher infection rates during the analysis period. The highest HBSAG in recent years confirms the idea that the public system's preventive and therapeutic guidelines are insufficient to contain the virus and its contagion.

CONCLUSION

Therefore, with the data collected from this review, it can be inferred that from 2013 to 2022 in the municipality of Rio Verde - Goiás there was a progressive increase in the rate of infection of the disease related to the seropositivity of certain antibodies to the disease and antigens of the B virus. Some limitations of these data persist in detecting the infection in terms of the phase in which it presents, such as the quantitative value of IgG antibodies against virus antigens, which should indicate the presence of infection in the chronic phase.

Furthermore, analyzing the data obtained, it can be seen that there was a small and progressive increase in contagion to the virus and the presence of the antigen in patients during the years 2013 to 2018. From 2019 onwards, there was a broad and rapid growth in contagion, demonstrating greater exposure of individuals to the virus, whether due to a deficient immune system or low vaccination coverage, fostered by insufficient computerization of the population regarding the degree of infectivity of the virus and the

importance of immunization on the part of health professionals.

Furthermore, from the perspective of the continuous increase in HBV infection, when observing the results obtained from epidemiological data it is possible to understand the important need to implement public policies that enable means, such as vaccination campaigns, for individuals to create antibodies in the fight against the viral antigen, there is a reduction in the number of individuals seropositive for Hepatitis B. In addition to campaigns, it is extremely important that professionals make patients aware, through oral information or advertising campaigns, of the likely liver problems that the viral disease can cause, one change offsets the other. In this way, it is possible to elucidate that among the main liver decompensations, there is cirrhosis, which can progress to liver failure, requiring transplantation, and liver neoplasia, which requires surgery.

It is worth pointing out, at the heart of the vaccination schedule, for children it is necessary to be administered after birth, and another three doses until the sixth month, for young people under 19 years of age who have not yet been vaccinated it is necessary to update, people at high risk of contamination must be vaccinated, newborns whose mothers with HBV must be immunized within 72 hours of life. The vaccine is contraindicated for those who have had severe allergic reactions to the vaccine in a previous dose and people allergic to the yeast used to make the vaccine. HBIG can help prevent infection if applied within 72 hours of exposure.

In summary, it can be understood that strengthening therapy against viral disease means inhibiting the evolution of phases of the pathology. Therefore, abundant hydration in conjunction with a regular diet would contribute to a faster recurrence of the disease and make it more difficult for it to worsen.

REFERENCES

- BONINO, F; BRUNETTO, M. R. **Antígeno e da Hepatite B crônica (HBeAg) negativo, Hepatite B anti-HBe positiva: uma visão geral.** *Journal of Hepatology*, v. 39, n. 1, 2003. Disponível em: [https://www.journal-of-hepatology.eu/article/S0168-8278\(03\)00319-2/fulltext](https://www.journal-of-hepatology.eu/article/S0168-8278(03)00319-2/fulltext). Acesso em: 27/10/2023.
- BURNS, G. S, THOMPSON, A. J. **Hepatite viral B: características clínicas e epidemiológicas.** *Cold Spring Harb Perspect Med*, v. 4, n. 12, 2014. Disponível em: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4292086/>. Acesso em: 27/10/2023.
- DUARTE, G, et al. **Protocolo Brasileiro para Infecções Sexualmente Transmissíveis 2020: hepatites virais.** *Rev. Epidemiologia e Serviços Saúde*, v. 30, supl. 1, 2021. Disponível em: <https://scielosp.org/article/ress/2021.v30nspe1/e2020834/>. Acesso em: 27/10/2023.
- FERREIRA, C. T, SILVEIRA, T. R. **Hepatites virais: aspectos da epidemiologia e prevenção.** *Rev. Bras. Epidemiologia*, v. 7, n. 4, 2004. Disponível em: <https://www.scielo.br/j/rbepid/a/Hb5tXY8xRxp8ph8JjVRMXWS/#> Acesso em: 27/10/2023.
- FERREIRA, C. T, SILVEIRA, T. R. **Prevenção das hepatites virais através de imunização.** *Jornal de Pediatria*, v. 82, supl. 3, 2006. Disponível em: <https://www.scielo.br/j/jped/a/9v3T3RvzqYJFdPZHG8YVwTB/#> .Acesso em: 27/10/2023.
- FERREIRA, M. S, **Diagnóstico e Tratamento da Hepatite B.** *Rev. Sociedade Brasileira de Medicina Tropical*, v. 33, n. 4, 2000. Disponível em: <https://www.scielo.br/j/rsbmt/a/3mWxXKfd9fCgJx4DmRjkhfy/#>. Acesso em: 27/10/2023
- FONSECA, J. C. F. **Histórico das Hepatites Virais.** *Rev. da Sociedade Brasileira de Medicina Tropical*, v. 43, n. 3, 2010. Disponível em: <https://www.scielo.br/j/rsbmt/a/9bHf8fzjZTdtc8pvZYfzPv/>. Acesso em: 26/10/2023.
- GONSALEZ, C. R, COSTA, S, **Hepatite B: o que é, sintomas, transmissão e se tem cura,** *Minha vida Saúde*, 2023. Disponível em: <https://www.minhavidacom.br/saude/temas/hepatite-b>. Acesso em: 27/10/2023
- HINRICHSEN, S, **Hepatite B: sintomas, transmissão, tratamento e cura,** *Tua Saúde*, 2023. Disponível em: <https://www.tuasaudecom/hepatite-b/>. Acesso em: 27/10/2023
- LOK, A.; MCMAHON, B. **Chronic Hepatitis B.** *Hepatology*; v.45, n.2, 2007. Disponível em: https://deepblue.lib.umich.edu/bitstream/handle/2027.42/55941/21513_ft.pdf?sequence=1&isAllowed=y . Acesso em: 03/11/2023
- Ministério da Saúde, **Hepatite B,** GOV, 2023. Disponível em: <https://www.gov.br/saude/pt-br/assuntos/saude-de-a-a-z/h/hepatites-virais/hepatite-b>. Acesso em: 03/11/2023
- Ministério da Saúde, **Protocolo Clínico e Diretrizes Terapêuticas para Hepatite B e Coinfeções, Biblioteca virtual em saúde do Ministério da Saúde,** 2017. Disponível em: https://www.gov.br/saude/pt-br/assuntos/saude-de-a-a-z/h/hepatites-virais/hepatite-b/pcdt_hepatite_b_270917.pdf . Acesso em: 03/11/2023
- PARANÁ, R; ALMEIDA, D, **História das Hepatites Virais,** *Sociedade Brasileira de Hepatologia*, 2003. Disponível em: <https://s.bhepatologia.org.br/pdf/historia.pdf>. Acesso em: 26/10/2023
- ZOLIN, B, **Tipos de hepatites virais: causas, sintomas, tratamento e prevenção.** *Drauzio Varella*, 2023. Disponível em: <https://drauziovarella.uol.com.br/hepatologia/tipos-de-hepatites-virais-causas-sintomas-tratamento-e-prevencao/> . Acesso em: 26/10/2023