

## Hematological Profile of Patients with Hepatitis B Aged 18 To 60 Years

Tariam Djibangar Agnès<sup>1\*</sup>, Mayanna Habkreo<sup>2</sup>, Adil Abdraman Madary Ourbo<sup>3</sup>, Mahamat Issa Gnoroty<sup>3</sup>, Abdelaziz Abdelkerim<sup>3</sup>, Ousman Fager Malick<sup>1</sup>, Nonhoungar Rodrigue<sup>1</sup>, Doudje Kondy<sup>1</sup>, Bessimbaye Nadlaou<sup>3</sup> and Abdelsalam Tidjani<sup>3</sup>

<sup>1</sup>Laboratory Department, National Reference University Hospital Center (CHU-RN), CHAD.

<sup>2</sup>Internal Medicine and Gastroenterology Department, National Reference University Hospital Center, N'Djamena, CHAD.

<sup>3</sup>Faculty of Human Health Sciences (FSSH)

### \*Correspondence:

Tariam Djibangar Agnès, Laboratory Department, National Reference University Hospital Center (CHU-RN), CHAD, Tel: (00235) 68845580.

Received: 29 Nov 2024; Accepted: 23 Dec 2024; Published: 02 Jan 2025

**Citation:** Tariam Djibangar Agnès, Mayanna Habkreo, Adil Abdraman Madary Ourbo, et al. Hematological Profile of Patients with Hepatitis B Aged 18 To 60 Years. Clin Immunol Res. 2025; 9(1): 1-4.

### ABSTRACT

Hepatitis B is a diffuse liver disease characterized by inflammatory hepatocellular damage and degenerative hepatocyte alterations, such as cytolysis, fibrosis, and necrosis. It evolves in acute or chronic forms with clinical manifestations linked to immune mechanisms. The present study aimed to analyze the hematological profile of adult hepatitis B patients.

**Materials and Methods:** This was a cross-sectional descriptive study conducted on 43 hepatitis B-positive patients at the CHU-RN from March to May 2024 (a 3-month period). Blood samples were collected from the elbow crease in EDTA tubes for complete blood count (CBC) analysis using an automated analyzer.

**Results:** The study revealed that the age group 18–29 years was the most represented, with 19 patients (44.2%), predominantly male (67.4%). Urban areas accounted for 60.5% of the patients (26 individuals). Variable anemia, progressing toward chronicity, was observed among the patients.

**Conclusion:** Hepatitis B reflects cirrhotic and hepatocellular complications. Prevention is essential to maintain health and well-being.

### Keywords

Patients, Hepatitis B, Hematological parameters, Cirrhosis.

### Introduction

Hepatitis B is a widespread liver condition characterized by inflammatory hepatocellular damage and degenerative alterations such as cytolysis, fibrosis, and necrosis. It evolves in either acute or chronic forms. Globally, approximately 360 million people (5% of the population) suffer from chronic hepatitis B infections, predominantly in Asia and Africa. Over one million deaths occur annually due to complications such as cirrhosis and hepatocellular carcinoma.

In Chad, as in other high-endemic regions, hepatitis B remains a

significant public health concern. Data from 2019–2021 indicate a 19% prevalence of hepatitis B in the general population. The implementation of WHO-recommended vaccination programs and the availability of cost-effective antiviral treatments have improved management protocols. However, the disease's evolution involves numerous complications, including notable hematological manifestations.

This study aimed to determine the hematological profile of patients diagnosed with hepatitis B.

### Methods

#### Study Design and Location

This was a cross-sectional descriptive study conducted over

three months, from March to May 2024. Patients were recruited from the Gastroenterology Department at the National Reference University Hospital Center (CHU-RN) in Chad. Informed consent was obtained from all patients or their guardians.

### Study Population

The study focused on adult patients of both sexes aged 18 to 60 years with hepatitis B who had undergone at least one hematological analysis.

### Blood Sampling

Blood was drawn via venipuncture using EDTA tubes to perform a complete blood count (CBC) aimed at assessing hematological parameters.

### Complete Blood Count Technique

#### Principle

The technique was based on counting blood cells by size, granularity, and hemoglobin measurement using colorimetry.

#### Procedure

- Turn on the device.
- Wait for the device to initialize completely.
- Mix the blood sample by inverting the tube.
- Uncap the blood tube.
- Position the sample at the aspiration needle.
- Press the START button.
- Remove the sample.
- Recap the tube.
- Place it on the rack.
- Wait for the results.
- Verify that the values obtained fall within the range provided by the manufacturer.

### Statistical Analysis

Data entry and analysis were performed using Microsoft Excel software.

### Ethical Considerations

The study was conducted following informed and written consent from patients. Anonymity and confidentiality of the information obtained were guaranteed.

### Results

#### Prevalence

During the study period, 43 out of 121 samples analyzed tested positive for hepatitis B, yielding a prevalence rate of 36%. Of these, 41 patients (95.35%) were solely infected with hepatitis B, while 2 patients (4.65%) had co-infection with HIV. All 43 patients underwent hematological examinations.

### Sociodemographic Variables

#### Gender

Male patients represented the majority, with 29 individuals (67.4%).

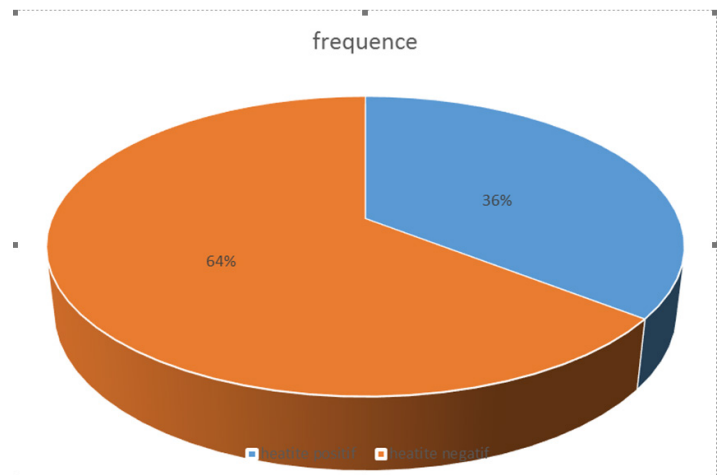


Figure 1 : Hepatitis B prevalence.

Table 1: Distribution of hepatitis B infected patients according to their gender.

GENDER	Nb.	Frequency
Male	19	44,2%
Female	12	27,9%
TOTAL OBS	43	100%

#### Age

The study showed that the age group from 18 to 29 was more represented, at 44.2%.

Table 2: Distribution of the infected patients according to their educational level.

Age range	N	Frequency
18 to 29 years old	19	44,2%
18 to 29 years old	12	27,9%
18 to 29 years old	12	27,9%
TOTAL OBS	43	100%

Minimum = 19; Maximum = 58; Average = 36,7.

Table 3: Distribution of the infected patients according to their educational level.

Educational level	Nb.cit.	Frequency
Primary	9	20,9%
Secondary	19	44,2%
University	9	20,9%
Non educated	6	14%
TOTAL OBS	43	100%

#### Educational Level

Among the study population, 6 patients (14.0%) were illiterate, 9 (20.9%) had primary-level education, 19 (44.2%) secondary-level, and 9 (20.9%) university-level education.

#### Marital Status

In this study, the most represented patients were married people with a number of 24 patients or 55.8%.

**Table 4:** Distribution of the infected patients according to their Marital Status.

Marital status	Nb.	Frequency
Single	16	37,2%
Married	24	55,8%
Divorced	3	7,0%
TOTAL OBS	43	100%

## Biological Variables

### Acute Hepatitis B

In this study, the baseline hemoglobin level was between 7 and 11.8 g/dl with an average of  $10.20 \pm 5.55$  g/dl. The MCHC, MCHC were  $30.64 \pm 3.25\%$  and  $26.52 \pm 3.84$  pg, respectively. Anemia was observed in 93% of patients. The degree of anemia was very variable, patients had moderate anemia.

**Table 5:** Distribution of patients with acute hepatitis B according to hematological parameters.

Setting	Average	standard gaps
Leukocyte	8,68	5,84
Hematocrit	28,52	6,58
hemoglobin	10,20	5,55
TCMH	26,52	3,84
MCHC	30,64	3,25
VGM	87,04	9,39
Folder	219,36	154,01

### Chronic Hepatitis B

In this study, the baseline hemoglobin level was between 7 and 11.8 g/dl with an average of  $10.20 \pm 5.55$  g/dl. The MCHC, MCHC were  $30.64 \pm 3.25\%$  and  $26.52 \pm 3.84$  pg, respectively. Anemia was observed in 93% of patients. The degree of anemia was very variable, patients had moderate anemia.

**Table 6:** Distribution of patients with chronic hepatitis B according to hematological parameters.

Leukocyte	8,61	3,71
Hematocrit	28,50	6,30
hemoglobin	8,78	2,05
TCMH	27,06	4,61
MCHC	44,33	65,11
VGM	87,67	17,23
Folder	212,94	192,33

## Discussion

This study explored the hematological aspects of hepatitis B virus (HBV) infection among patients admitted and followed up at CHU-RN. Based on data, we gained insights into the hematological profile of these patients. From the 121 samples analyzed, 43 patients tested positive, resulting in a prevalence rate of 36%. Despite the availability of an effective vaccine, hepatitis B remains a public health issue. This high prevalence could be attributed to a lack of awareness about vaccination and limited understanding of the disease among the population. This rate is higher than those reported in studies by Katile in Mali (11.1%) [6], Kakisingi in the Democratic Republic of Congo (8.01%) [7], and

other African researchers like Buseri in Nigeria (18.6%) [8], Kra in Abidjan (15.6%) [9], and Nagolo in Burkina Faso (13.4%) [10]. Differences in prevalence may result from variations in sample size and study type.

Hepatitis B affects both genders, with a predominance in males at 67.4%, compared to 32.6% in females, yielding a gender ratio of 2.07. This finding aligns with the studies by Dembélé in Mali [1] and Ankouane et al. in Cameroon [12], who reported male predominance rates of 72.8% and 74.6%, respectively. Similar results were observed by Ntagirabiri et al. [13], Traoré [14], Sombié et al. [15], and Diallo et al. [16], with male predominance rates of 52.4%, 63.6%, 66.9%, and 71.6%, respectively. This predominance could be attributed to lifestyle factors, as men are more frequently exposed to risk factors such as alcohol, tobacco, and risky sexual behavior.

In our study, the age group of 18 to 29 years was most represented, accounting for 43.75%. The average age was 36.7 years, with extremes ranging from 19 to 58 years. This average aligns with findings by Katile et al. in Mali ( $36.9 \pm 10.8$  years old) [6] and Dembélé (35.11  $\pm$  11.12 years old) [11]. The young age group's high representation could be attributed to early vertical and horizontal transmission as major modes of infection [12], as well as increased sexual exposure.

Table 3 shows that patients with a secondary education level were most affected, at 44.2%. This could be due to a lack of information and awareness about the disease. Regarding marital status, the study revealed that married individuals were more affected. This could be explained by the infidelity of one partner. Hematological Analysis among patients with acute hepatitis B, baseline hemoglobin levels ranged from 7 to 11.8 g/dL, with an average of  $10.20 \pm 5.55$  g/dL. MCHC and MCH were  $30.64 \pm 3.25\%$  and  $26.52 \pm 3.84$  pg, respectively, indicating normocytic hypochromic anemia. The degree of anemia varied, with 93% of patients presenting moderate anemia. These findings differ from those of Nacoulma, who reported microcytic hypochromic anemia in 20% of cases.

For patients with chronic hepatitis B, baseline hemoglobin levels ranged from 5.2 to 9.86 g/dL. MCHC and MCH had average values of  $44.33\% \pm 65.11\%$  and  $27.06 \pm 4.61$ , respectively, suggesting normocytic anemia with suspected spherocytosis. Severe anemia was observed in 98% of patients. These results exceed those found by Denie [17], who reported 88% for hemoglobin levels below 12. The discrepancy may arise from differences in inclusion criteria, as their study focused on the influence of anemia on changes in cirrhotic patients. Thrombocytopenia was not observed in our study, contrasting with a series from Burkina Faso by Nacoulma [18], which reported a rate of 59.5%. HBV infections often progress to chronicity, which can be explained by delayed consultation and the typically silent nature of HBV-associated liver disease.

---

## Conclusion

Hepatitis B remains a global health concern, and Chad continues to experience high endemicity. However, uncertainty persists regarding the interpretation of hematological profiles, leading to ambiguities in preventive strategies. Prevention, early identification, follow-up, and therapeutic management of hepatitis B are crucial measures to prevent cirrhosis and hepatocellular carcinoma. Additionally, the highly effective HBV vaccine, recommended in early childhood, should also be offered to at-risk individuals. Thus, our study on the hematological profile allowed us to evaluate the form of anemia during each phase of hepatitis among patients admitted to CHU RN.

## References

1. De Franchis R, Marcellin P, Neil McIntyre, et al. EASL International Consensus Conference on Hepatitis. B. J Hepatol. 2003; 39: S3-S25.
2. Kramvis A, Kew MC. Epidemiology of hepatitis B virus in Africa, its genotypes, and clinical associations of genotypes. Hepatol Res. 2007; 37: S9-S19.
3. Dyèvre P, Leger D. Maladies infectieuses et risques biologiques en Médecine du travail. Approches de la santé en travail. 3rd edition. Paris: Masson; 2003.
4. Mahamat Moussa Ali, Aguid Mahamat Nour, Tomonta Guy Ndabna, et al. Knowledge of Hepatitis B and seroprevalence of HBsAg, Anti-HCV, and HIV among sex workers in Ndjamen. ICASA 2017 – The 19th International Conference on AIDS and STIs in Africa. December 4-9.
5. Mahamat Moussa Ali, Abdel Salam Saleh, et al. Prevalence of Accidents Involving Potentially Contaminated Biological Products in Healthcare Workers in Ndjamen. Health Sci Dis. 2018; 19.
6. Katilé D, Konate I, Goita D, et al. Prevalence of HBs Antigen and Serological Profile of Hepatitis B Virus in General Medicine Consultations at Kayes Regional Hospital in Mali. Health Sci Dis. 2018; 19.
7. Kakisingi CN, Mukuku O, Matanda SK, et al. Epidemiological profile and seroprevalence among blood donors at university clinics in Lubumbashi, Democratic Republic of Congo. Pan Afr Med J. 2016; 23: 9.
8. Buseri FI, Muhibi MA, Jeremiah ZA. Sero-epidemiology of transfusion-transmissible infectious diseases among blood donors in Osogbo, southwest Nigeria. Blood Transfus. 2009; 7: 293-299.
9. Kra O, N'dri N, Ouattara B, et al. Prevalence of HBs Antigen in a Population of Gendarmerie Recruits in Côte d'Ivoire, 2008. Med Sante Trop. 2012; 22: 219-220.
10. Nagalo BM, Bisseye C, Sanou M, et al. Seroprevalence and incidence of transfusion-transmitted infectious diseases among blood donors in Burkina Faso, West Africa. Trop Med Int Health. 2012; 17: 247-253.
11. Dembélé R. Epidemiological and serological profile of hepatitis B virus in an urban setting in Bamako [Thesis]. Public Health: Bamako. 2011; 62.
12. Ankouane F, Kowo M, Njoya O, et al. Chronic HBe Antigen-negative Hepatitis B in Yaoundé Cameroon. Health Sci Dis. 16: 5.
13. Ntagirabiri R, Munezero B, Nahimana C, et al. Genotypes of Hepatitis B Virus and Evolutionary Markers in Chronic HBsAg Patients in Bujumbura. Pan Afr Med J. 2016; 23: 95.
14. Traoré O. Epidemiological profile of chronic viral hepatitis B at CHU HASSAN II Fes [Thesis]. Epidemiology Fes. 2016; 58.
15. Sombié R, Bougouma A, Diallo O, et al. Chronic Hepatitis B: Epidemiological, Diagnostic, Therapeutic, and Evolutionary Aspects at Yalgado Ouédraogo University Hospital Ouagadougou. J Afr Hepato Gastroenterol. 2010; 4: 3-10.
16. Diallo S, Bassène ML, Gueye MN, et al. Hepatitis B Virus: Clinical, Paraclinical, and Evolutionary Aspects at the Hepatology and Gastroenterology Department of Aristide Le Dantec Hospital: A Study of 728 Cases. Pan Afr Med J. 2018; 31: 82.
17. Denie C, Poynard T, Gadano A, et al. Influence of Anemia on Hemodynamic Changes in Patients with Cirrhosis. Gastroenterol Clin Biol. 1997; 21: 29-31.
18. Nacoulma EW, Zongo S, Drabo YJ, et al. Different Types of Anemia in Cirrhosis at Yalgado Ouédraogo University Hospital Ouagadougou (Burkina Faso). Cahier Santé. 2007; 17: 87-91.