SERO PREVALENCE OF HEPATITIS B AND C VIRUS INFECTION AMONG INPATIENTS AT THE FEDERAL NEUROPSYCHIATRIC HOSPITAL, USELU, BENIN CITY, EDO STATE

BY

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BEING A PROJECT SUBMITTED TO THE DEPARTMENT OF MEDICAL LABORATORY SCIENCE IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF BACHELORS DEGREE IN MEDICAL LABORATORY SCIENCE (BMLS) UNIVERSITY OF BENIN, BENIN CITY, EDO STATE.

SUPERVISED BY

DR (MRS) IFUEKO M. MOSES-OTUTU

OCTOBER, 2025

CERTIFICATION

This is to certify that this research work titled "SERO PREVALENCE OF HEPATITIS B AND C VIRUS AMONG INPATIENTS AT THE FEDERAL NEUROPSYCHIATRIC HOSPITAL, USELU, BENIN CITY, EDO STATE" was carried out by OKAFOR ABUNDANCE IHIN-OMA with matriculation number BMS2101518, in the Department of Medical Laboratory Science, School of Basic Medical Sciences, University of Benin in partial fulfillment of the requirement for the award of Bachelor of Medical Laboratory Science (BMLS) degree.

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DEDICATION

I dedicate this project to Almighty God for granting me the Grace, Mercy and Strength to successfully complete this work.

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I give thanks to Almighty God my creator who has granted me grace and strength to finish this work. My profound gratitude goes to my supervisor, Dr.(Mrs) Ifueko M. Moses-Otutu for her genuine concern, support and guidance throughout the course of this study. My very special thanks goes to Dr.(Mrs) Zainab Omoruyi (Head of Department, Medical Laboratory Science), whose counsel and support contributed to the success of this study. I want to thank all my lecturers and medical laboratory scientists (Department of Medical Laboratory Science, University of Benin) who has imparted knowledge in me all through my period in this school.

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ABSTRACT

Psychiatric patients are considered at increased risk for blood-borne viral infections such as Hepatitis B virus (HBV) and Hepatitis C virus (HCV), due to behavioral, social, and health-system factors. This study's aim was to determine the prevalence of Hepatitis B and C virus infection among inpatients at the Federal Neuropsychiatric Hospital, Uselu, Benin City. A cross-sectional assessment was used for this study and One hundred and one (101) in-patients were recruited using simple random sampling technique. Demographic and clinical data were collected using structured forms. Blood samples were obtained from each patients and serum samples were obtained and tested for HBV surface antigen (HBsAg) and anti-HCV antibodies using rapid immunochromatographic assays. Data were analyzed using descriptive statistics and chi-square tests to assess associations between infection status and demographic/clinical variables. Of the 101 participants used in the study, 70.3% were male and the majority (40.6%) was aged 21–30 years. Schizophrenia (38.6%) and mental and behavioral disorders (48.5%) were the leading diagnoses observed in the study. The prevalence of HBV was 2.97% (3/101), while no HCV infection was detected. No significant association was found between psychiatric diagnosis and HBV status. However, ethnicity and marital status were significantly associated with HBV positivity. Age, sex, occupation, and religion were not significantly associated with infection. Psychiatric diagnosis was not associated with HBV, but ethnicity and marital status showed significant associations, suggesting household and community transmission influences. Thus, this study emphasizes the importance of routine HBV/HCV screening of psychiatric in-patients. HBV vaccination for non-immune patients, staff and household contacts, and integration of hepatitis services into psychiatric care are also strongly recommended.

CHAPTER ONE

INTRODUCTION

1.1 Background of Study

Viral infections known as Hepatitis B and C have a serious negative effect on liver health and can cause cirrhosis, chronic liver disease, and liver cancer (WHO, 2024). Hepatitis C, while less frequent, nonetheless provides a public health challenge. . Hepatitis B virus (HBV) and Hepatitis C virus (HCV) are serious global public health hazards, responsible for considerable morbidity and mortality globally. The World Health Organization (WHO, 2024) estimates that 50 million people worldwide have chronic HCV and 254 million have chronic HBV, and that both infections cause over 1.3 million deaths per year. While HCV is primarily blood-borne and linked to unsafe medical procedures, transfusions, and injection drug use, HBV is typically spread through contact with infected blood and bodily fluids, including sexual contact, unsafe injections, and vertical (mother-to-child) transmission (WHO, 2024a; WHO, 2024b). Global initiatives have focused on screening, immunization (for HBV), and therapy to lessen the impact of these infections throughout the last ten years. WHO (2024a) reports that as a result of extensive vaccination campaigns, the prevalence of HBV in children under five has decreased to less than 1%. However, in some areas, particularly in the WHO Western Pacific and African regions, HBV is still very common among adults. Similarly, over 56 million individuals continue to live with a chronic HCV infection, despite a decline in new infections worldwide as a result of enhanced blood screening and harm-reduction measures (WHO, 2024b; Polaris Observatory, 2020).

Due to common ways of transmission, including substance abuse, improper injection techniques, and blood transfusions, psychiatric patients—especially those in inpatient settings—may be at higher risk for

contracting Hepatitis B and C (Dinwiddie *et al*., 2003). Research from different contexts sheds light on this. In the United States, for example, a 2003 study found that the sero prevalence of Hepatitis C virus among psychiatric patients in a public-sector hospital was 8.5%, which is much higher than the prevalence in the general population (Dinwiddie *et al*., 2003). This implies that psychoactive substance use disorders, which can raise exposure to blood-borne infections, may be additional risk factors for mental patients. According to a large-scale Chinese study (Liu *et al*., 2024), mental inpatients had comparatively lower rates of HBV (3.75%) and HCV (0.23%), underscoring the role that successful vaccination campaigns and local epidemiology play in determining infection risks. However, the psychiatric community is still at high risk in low- and middle-income nations with inefficient hepatitis control (Hughes *et al*., 2016; Durotoye *et al*., 2014).

Nigeria has a high prevalence of viral Hepatitis, with Hepatitis B being a major concern due to its high prevalence. In a Nigerian tertiary hospital in Ilorin, 10% of psychiatric patients tested positive for HBsAg and 12.6% for anti-HCV antibodies (Durotoye *et al.,* 2014), higher than the rates among blood donor controls in the same study. Similarly, Omoraegba *et al*. (2013) found that newly admitted patients with psychosis, none of whom had previously been diagnosed, had HBsAg and anti-HCV positivity rates of 3.1% and 4.2%, respectively. This is considered a high prevalence, with sub-group analyses showing a higher rate in rural settings (10.7%) and the North West region (12.1%) (Afolabi *et al.,* 2021).The high prevalence is ascribed to a number of factors, including socioeconomic conditions, cultural practices, and limited vaccination coverage. The Nigeria HIV-AIDS Indicator and Impact Survey, 2018 (NAIIS 2018) reported a hepatitis C virus (HCV) prevalence of 1.1% among adults aged 15–64 years (WHO, 2023), which is in line with estimates that approximately 19 million Nigerians are chronically infected with hepatitis B, C, or both, with over 80% of them being unaware of their status. Sub-Saharan Africa is still a region with high

endemicity for both HBV and HCV; Nigeria in particular is considered hyper endemic, with HBV prevalence ranging from 8% to 12% and HCV prevalence of 1% to 2% (Duru *et al.,* 2016; WHO, 2020; Adekanle *et al*., 2022). According to the Nigerian Federal Ministry of Health's 2018 national hepatitis survey, the prevalence of chronic HBV was 8.1% and that of HCV was 1.1%. With an estimated 20 million Nigerians living with HBV or HCV, these numbers demonstrate a substantial burden (WHO, 2020).

The Federal Neuropsychiatric Hospital, Uselu in Benin City is a key mental health institution serving Southern Nigeria. Therefore, understanding the current sero prevalence of HBV and HCV in this population is crucial for implementing effective infection control, vaccination, and treatment strategies within psychiatric institutions.

1.2 Statement of the Problem

The World Health Organization (WHO) has declared hepatitis B to be highly endemic, with a prevalence of over 8%. This study's reasoning is based on a number of important factors. Given the high prevalence of hepatitis B virus (HBV) and hepatitis C virus (HCV) infections in Nigeria, focused study among high-risk populations, including psychiatric inpatients, is essential. This group is especially at risk because they are frequently missed by standard health screenings and because mental health issues can conceal physical illnesses like hepatitis and related hematological abnormalities.

1.3 Justification

A study on the prevalence of HBV and HCV infections among psychiatric in-patients at Federal Neuro Psychiatric Hospital, Benin City, is necessary due to the high global burden of viral hepatitis. Due to the risk of transmission and complications in this susceptible population, failure to identify and treat these infections can lead to higher morbidity and healthcare expenses. Additionally, more local data is required to inform

interventions in psychiatric settings.The study intends to give crucial knowledge that can guide public health efforts, such as vaccination campaigns, screening procedures, and treatment interventions, by examining the sero prevalence of hepatitis B and C among this particular group. In the end, the results will help to enhance patient treatment, lower the overall burden of the disease, and aid Nigeria's larger national initiatives to prevent and control hepatitis.

1.4 Aim

The aim of this study was to determine the sero prevalence of HBV (HBsAg) and HCV (anti-HCV) antibodies among in-patients at the Federal Neuropsychiatric Hospital, Uselu, Benin City.

1.5 Specific Objectives

The specific objectives of the study are:

1. To determine the prevalence of Hepatitis B and C viral infection among psychiatric in-patients at Federal Neuropsychiatric Hospital, Uselu, Benin City.

2. To determine the relationship between demographic characteristics and the prevalence of Hepatitis B and C viral infection among in-patients at the Federal Neuropsychiatric Hospital, Uselu, Benin City.

3. To identify relationship between demographics characteristics and primary psychiatric diagnosis associated with HBV/HCV positivity.

1.6 Research Question

1. What is the prevalence of hepatitis B and C among psychiatric in-patients in Benin City?

2. Is there a significant association between hepatitis B or C infection and demographic characteristics?

3. What effect does Hepatitis B and C have on the physical and cognitive ability of this psychiatric population?

4. Is there a relationship between demographic characteristics and primary psychiatric diagnosis of the study population?

1.7 Research Hypothesis

1.7.1 Null Hypothesis (H0):

1. There is no significant prevalence of Hepatitis B and C infection among psychiatric in-patients at the Federal Neuropsychiatric Hospital, Uselu, Benin City.

2. There is no significant relationship between demographic characteristics and Hepatitis B and C infection at the Federal Neuropsychiatric Hospital, Uselu, Benin City.

3. There is no relationship between demographics characteristics and primary psychiatric diagnosis associated with HBV/HCV positivity.

1.7.2 Alternate Hypothesis (H1):

1. There is a significant prevalence of Hepatitis B and C infection among psychiatric in-patients at the Federal Neuropsychiatric Hospital, Uselu, Benin City.

2. There's a significant relationship between demographic characteristics and Hepatitis B and C infection at the Federal Neuropsychiatric Hospital, Uselu, Benin City.

3. There is a relationship between demographics characteristics and primary psychiatric diagnosis associated with HBV/HCV positivity

CHAPTER TWO

LITERATURE REVIEW

2.1 Hepatitis B and C Virus

Hepatitis B virus (HBV) was first discovered in 1965 when Baruch Blumberg identified the "Australia antigen" in the blood of an Australian aborigine. This antigen was later confirmed as the hepatitis B surface antigen (HBsAg), a landmark discovery that earned Blumberg the Nobel Prize in 1976. HBV was the first hepatitis virus to be identified, and its discovery paved the way for the development of the first hepatitis B vaccine in 1981. HBV is a small, enveloped DNA virus approximately 42 nm in diameter. Its genome is partially double-stranded, circular DNA (3.2 kb), and it belongs to the Hepadnaviridae family (Seeger and Mason, 2015). The virus replicates via reverse transcription of an RNA intermediate, a unique mechanism among DNA viruses. HBV consists of three major structural proteins: the surface antigen (HBsAg), core antigen (HBcAg), and e antigen (HBeAg) (Block *et al*., 2003). HBV infects only humans and some non-human primates. It is classified under the species Orthohepadnavirus hominis. The virus is genetically diverse and has been divided into at least 10 genotypes (A–J), each with a distinct geographic distribution. For example, genotypes A and E are predominant in sub-Saharan Africa, while genotypes B and C are more common in East Asia (Kramvis, 2014).

In contrast, hepatitis C virus (HCV) remained elusive and was originally referred to as “non-A, non-B hepatitis.” It wasn't until 1989 that Houghton and colleagues successfully cloned the virus using molecular biology techniques, leading to its official identification as HCV. This discovery enabled the development of diagnostic tests and, eventually, direct-acting antiviral (DAA) treatments, which revolutionized HCV management (Alter *et al*., 2020). HCV is a small, enveloped virus of about 50–60 nm in diameter,

containing a single-stranded, positive-sense RNA genome of approximately 9.6 kb (Moradpour *et al*., 2007). It belongs to the Flaviviridae family. The virus encodes a single polyprotein that is cleaved into structural and non-structural proteins (NS2–NS5B), which are essential for replication and assembly (Pawlotsky, 2020). HCV replicates only in the cytoplasm, in contrast to HBV. Humans and, on occasion, chimpanzees are also infected by HCV. It belongs to the Hepacivirus hominis species. With over 90 subtypes and at least 8 genotypes, HCV is a very diverse virus. According to Messina *et al*. (2015), genotype 1 is the most frequent genotype globally, genotype 3 is common in South Asia, and genotype 4 is predominant in several regions of the Middle East and Africa.

2.2 Structure of Hepatitis B virus

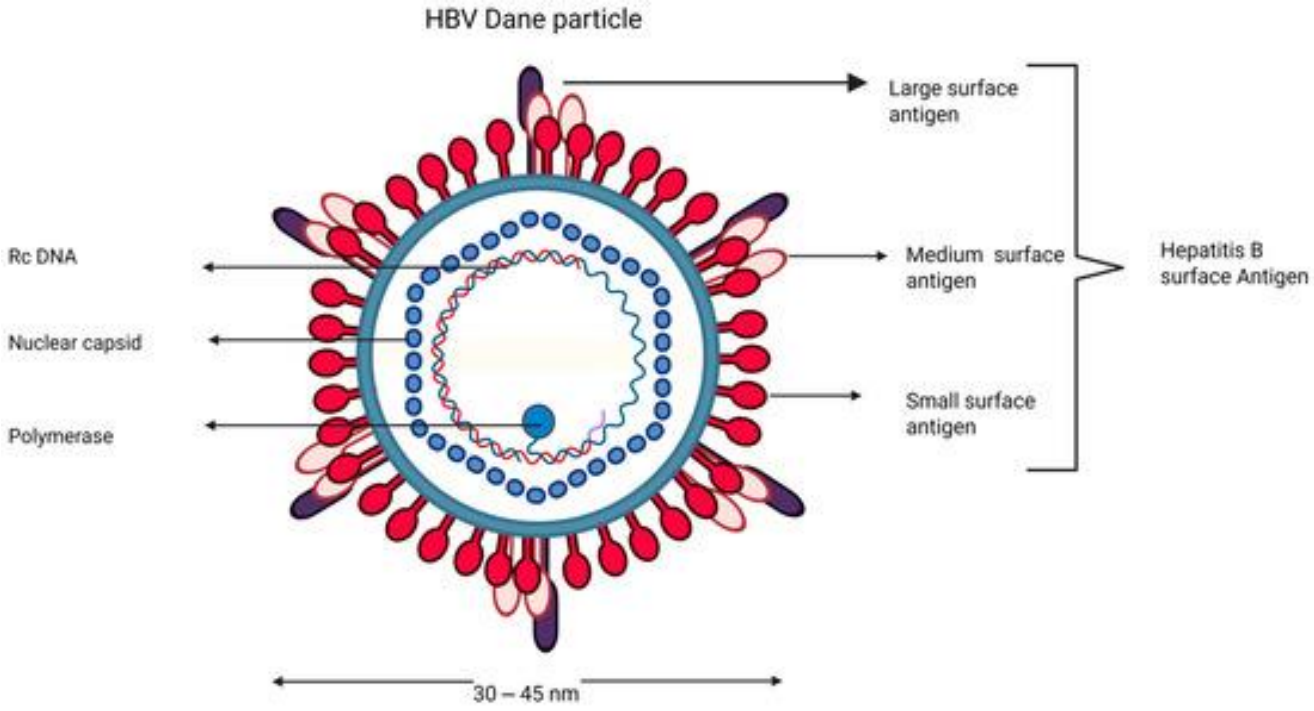

Figure 2.1. Structural representation of infectious HBV virions. HBsAg S, M, and L surface proteins on the lipid envelope. The lipid envelope surrounds the nucleocapsid (containing a relaxed circular DNA (rcDNA) and the viral DNA polymerase. (Sibiya, *et al.*, 2025)

2.3 Structure of Hepatitis C virus

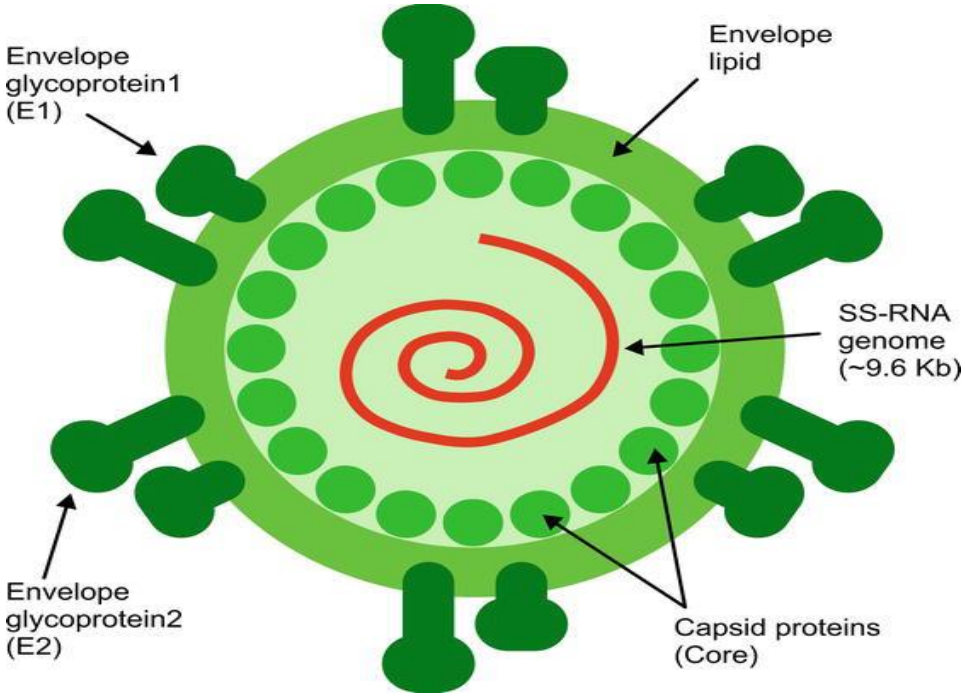

Figure 2.2. Hepatitis C genome structure (Toygar, *et al*, 2023)

2.4 Life Cycle of Hepatitis B and C

2.4.1 Lifecycle of Hepatitis B Virus

Unlike most DNA viruses, the hepatitis B virus (HBV) has a distinct and intricate reproduction cycle that includes reverse transcription. The virus uncoats when it enters the hepatocyte and transports its partially double-stranded relaxed circular DNA (rcDNA) into the nucleus, where host DNA repair enzymes transform it into covalently closed circular DNA (cccDNA) (Revill *et al*., 2020). Host RNA polymerase II uses this cccDNA as a template for transcription, producing a pregenomic RNA (pgRNA) and different viral mRNAs. Together with HBV polymerase, the pgRNA is encapsulated in nucleocapsids in the cytoplasm, where it undergoes reverse transcription into negative-strand DNA and partial synthesis of the positive strand to create new rcDNA (Levrero *et al.*, 2016). Some of these nucleocapsids are released as infectious virions after being encased in surface antigens that come from the endoplasmic reticulum (ER). Others help the virus remain persistent by being returned to the nucleus to refill the cccDNA pool. Since cccDNA can remain in hepatocytes even after serological clearance of HBV DNA, its production and stability pose a significant challenge to cure (Lucifora and Protzer, 2017). This cccDNA reservoir is essential for long-term HBV infection and is responsible for both high-level replication during immune-tolerant or active phases, which are frequently linked to detectable HBeAg and elevated HBV DNA levels, as well as low-level viral protein production and immune modulation in inactive carriers (Seto *et al.*, 2018).

2.4.2 Life Cycle of Hepatitis C Virus

The hepatitis C virus (HCV) replicates cytoplasmically, without the use of a DNA intermediary. Through interactions with lipoproteins and several cellular receptors, such as occludin, CD81, claudin-1, and scavenger receptor class B type I (SR-BI), the virus initially binds to host cells (Yoshimoto *et al*., 2020).

The positive-sense RNA genome is released into the cytoplasm by clathrin-dependent endocytosis, which is followed by the viral envelope fusing with endosomal membranes. An internal ribosome entry site (IRES) in the 5' UTR directs the translation of the viral RNA on rough endoplasmic reticulum (ER) membranes. The single polyprotein produced by this translation is broken down by host and viral proteases into distinct structural and non-structural proteins (Neufeldt *et al.,* 2018). On ER-derived membranous webs, RNA-dependent RNA polymerase NS5B creates a negative-strand RNA intermediate that is used as a template to create new positive-strand genomes during replication. As nucleocapsids bud into the ER lumen, new virions are produced. These virions are tightly linked to very-low-density lipoprotein (VLDL) pathways, which facilitate viral envelopment and release through the host secretory route (Targett-Adams *et al*., 2019).

2.5 Taxonomy and Nomenclature

HBV is classified as follows:

Realm: Riboviria

Order: Blubervirales

Family: Hepadnaviridae

Genus: Orthohepadnavirus

Species: Orthohepadnavirus hominis (International Committee on Taxonomy of Viruses [ICTV], 2023)

HCV is classified as:

Realm: Riboviria

Order: Amarillovirales

Family: Flaviviridae

Genus: Hepacivirus

Species: Hepacivirus hominis (ICTV, 2023)

The molecular and evolutionary differences between the two viruses are highlighted by the classification. While HCV is an RNA virus with high mutation rates that help it avoid immune responses and gain tolerance, HBV is a DNA virus with a pararetroviral replication cycle (Scheel & Rice, 2013; Simmonds *et al.*, 2017).

2.6 Mode of Transmission of HBV and HCV

2.6.1 Hepatitis B Virus (HBV)

Contact with contagious bodily fluids, including blood, semen, and vaginal secretions, can spread the hepatitis B virus. Perinatal (mother-to-child), horizontal (particularly among youngsters in endemic areas), sexual contact, improper injections, transfusions, and sharing of infected needles are the main ways that the disease is spread (World Health Organization [WHO], 2021). A major factor in the worldwide burden of HBV is vertical transmission, particularly in endemic areas like Southeast Asia and sub-Saharan Africa (Schweitzer *et al*., 2015). In underdeveloped nations, nosocomial transmission through non-sterile medical procedures continues to be a public health risk (Kfutwah *et al*., 2015). Furthermore, healthcare personnel have a high risk of transmission through needlestick injuries (Tatsilong *et al*., 2016). Unprotected intercourse, intravenous drug use, and a lack of screening protocols are among the factors that enhance the risk of HBV transmission in psychiatric institutions and correctional facilities (Umeh *et al.*, 2019).

2.6.2 Hepatitis C Virus (HCV)

The main way that HCV is spread is by direct contact with contaminated blood. Sexual and perinatal transmission of HCV is less effective than that of HBV, but it is nevertheless conceivable (Terrault *et al*., 2016). Reusing infected medical equipment, transfusion of unscreened blood products, sharing needles and other drug-injection paraphernalia, and hazardous medical practices are the main ways that the disease is spread (Hagan *et al*., 2015). Injection drug use contributes significantly to the spread of HCV worldwide, especially in high-income nations (Nelson *et al.,* 2017). Unsafe medical procedures and restricted access to sterile equipment are also major contributors to the development of HCV in low- and middle-income countries like Nigeria (Karoney and Siika, 2013). Psychiatric individuals are more at risk, particularly if they have a history of intravenous drug use or risky sexual conduct (Okonko *et al*., 2020).

Although both HBV and HCV are blood-borne, HBV is more likely to spread through sexual contact and pregnancy, whereas HCV is more likely to spread through injections and healthcare settings (WHO, 2021; CDC, 2020). Because HBV can survive outside the body for at least seven days and is roughly 50–100 times more contagious than HIV, the likelihood of indirect transmission is increased (Seeger and Mason, 2015).

2.7 Pathogenesis of HBV and HCV

Hepatitis B virus (HBV) pathogenesis includes both direct viral impacts and—more crucially—host immunological responses. Once in the circulation, HBV uses the sodium taurocholate co-transporting polypeptide (NTCP) receptor to target hepatocytes (Yan *et al.,* 2012). Covalently closed circular DNA (cccDNA), a stable episomal form that acts as a template for viral transcription, is created when the virus's relaxed circular DNA (rcDNA) enters the cell and is carried into the nucleus (Seeger and Mason, 2015). HBV has very little direct cytotoxic effect. The host immune response, in particular the cytotoxic T lymphocyte (CTL) response, which targets infected hepatocytes carrying viral antigens, is primarily

responsible for liver damage (Bertoletti and Ferrari, 2016).Viral clearance during acute infection is usually the result of robust and multispecific CD8+ T-cell responses. Ongoing liver inflammation and sustained viral replication are made possible by a weakened and frequently worn-out immune response in chronic infections (Peppa *et al.,* 2017). Hepatocyte necrosis, regeneration, fibrosis, and ultimately cirrhosis and hepatocellular carcinoma (HCC) are caused by chronic inflammation (Seto *et al.,* 2018). Because of its impact on transcriptional regulation, signal transduction, and cell cycle control, the HBV X protein (HBx) has also been linked to hepatocarcinogenesis (Slagle and Bouchard, 2018). The pathophysiology of the hepatitis C virus (HCV) is distinct. The virus experiences endocytosis upon entering hepatocytes, which is facilitated by a number of receptors such as CD81, claudin-1, and scavenger receptor class B1. This releases the virus's RNA genome for cytoplasmic translation and reproduction. (Moradpour *et al*., 2007). In contrast to HBV, HCV uses immune evasion techniques to create a sustained infection rather than integrating into the host genome. The host immunological response, specifically the lysis of infected cells by CD8+ T-cells, is the primary cause of liver damage in HCV infection (Rehermann, 2013). But in more than 70% of cases, the virus's rapid mutation rate—which is fueled by its RNA polymerase's tendency to make mistakes—allows it to evade adaptive immunity and encourages chronic infection (Simmonds *et al*., 2017). Hepatic cirrhosis, fibrosis, steatosis, and HCC are caused by a persistent HCV infection. Additionally, it causes metabolic syndrome and insulin resistance, both of which worsen liver damage (Lonardo *et al.,* 2015). Hepatic inflammation and fibrogenesis are facilitated by higher levels of proinflammatory cytokines such TNF-α and IL-6 (Bataller and Brenner, 2005).

While immune-mediated hepatocellular damage is a common feature of both HBV and HCV, HBV uses nuclear cccDNA and possible genome integration, while HCV replicates only in the cytoplasm. Stronger acute immunological responses may cause HBV to resolve on its own more frequently than HCV, but

immune evasion and viral mutation cause HCV to develop to chronicity more frequently. Although they do so in different ways, both viruses are linked to hepatocellular carcinoma: HCV primarily causes oxidative stress and chronic inflammation, whereas HBV can directly cause carcinogenesis through oncogenic effects (e.g., HBx) (Arzumanyan *et al.*, 2013).

2.8 Immune Response to Hepatitis B and C Virus

One important factor influencing the course of an infection is the immune system's reaction to HBV. The host's defense systems against HBV infection are coordinated by innate and adaptive immunity. Although HBV is sometimes described to as a "stealth virus" due to its inability to significantly trigger type I interferon responses in infected hepatocytes, innate immunity is the first line of defense (Wieland *et al*., 2015). On the other hand, HBV antigens can trigger the production of antiviral cytokines and chemokines by natural killer (NK) cells, dendritic cells, and macrophages (Xu *et al.,* 2020). Viral clearance depends on adaptive immunological responses, particularly virus-specific cytotoxic CD8+ T lymphocytes (CTLs) (Bertoletti & Ferrari, 2016). A strong, multispecific CD8+ T-cell response is usually seen in self-limited (acute) infections. These CTLs release antiviral cytokines including TNF-α and IFN-γ and destroy infected hepatocytes. According to Ferrari et al. (2020), CD4+ T helper cells aid in the production of neutralizing antibodies against HBV surface antigen (HBsAg) by B cells and boost CTL activity. Immune depletion happens in chronic HBV infections. A tolerogenic hepatic milieu, increased expression of inhibitory molecules (e.g., PD-1), and prolonged antigen stimulation all contribute to the malfunction of virus-specific CD8+ T cells (Peppa *et al*., 2017). Sterilizing immunity is hampered by the preservation of covalently closed circular DNA (cccDNA) in hepatocyte nuclei. Viral neutralization is aided by humoral reactions, which are typified by anti-HBs antibodies. These antibodies, however, are frequently lacking in chronic carriers, and HBsAg stays high for years (Revill *et al*., 2020).

Compared to HBV, HCV triggers a stronger innate immune response. Type I and III interferons, as well as other pro-inflammatory cytokines, are produced when pattern recognition receptors (PRRs), such as RIG-I and TLRs, recognize HCV RNA (Park and Rehermann, 2014). However, HCV quickly creates defenses against these reactions by interfering with JAK-STAT signaling and cleaving MAVS. Adaptive immunity is essential for HCV management. Strong, multispecific CD8+ T-cell responses are correlated with spontaneous viral clearance in acute infection (Grakoui *et al*., 2003). Both maintaining CD8+ responses and supporting B-cell maturation depend on CD4+ T helper cells. Despite this, 70–85% of cases result in chronic HCV infection, frequently as a result of the virus's rapid rate of mutation and capacity for immune evasion (Simmonds *et al.*, 2017). The genetic variety of viral envelope glycoproteins causes CD8+ T lymphocytes to deplete and neutralizing antibody responses to frequently be ineffective or delayed (Hensel *et al*., 2016).

In chronic stages, both viruses cause immunological exhaustion, but HCV exhibits stronger genetic diversity and evasion. In contrast, HBV does not rely on high mutation rates to persist; instead, it uses host tolerance mechanisms and cccDNA.

2.9 Epidemiology of Hepatitis B and C Viruses

2.9.1 Global Epidemiology

Two serious global public health issues are the hepatitis B and hepatitis C viruses. About 296 million people had a chronic HBV infection and 58 million had a chronic HCV infection in 2019, according to the World Health Organization (WHO, 2021). These viruses have caused 1.1 million deaths globally, mostly from hepatocellular carcinoma (HCC) and liver cirrhosis.

In areas like sub-Saharan Africa, East Asia, and the Western Pacific, where incidence rates surpass 8%, HBV is extremely endemic (WHO, 2021). Conversely, Western Europe and North America have lower prevalence rates (<1%). Particularly in nations like China and Taiwan, universal baby immunization programs have made a substantial contribution to the decline in the incidence of HBV (Chang *et* al., 2016).

Egypt has historically had the highest prevalence of HCV because of previous risky medical practices; the highest prevalence is found in Central and East Asia, North Africa, and Eastern Europe (Petruzziello *et al*., 2016). Injection drug use and improper medical injections in some areas are the main causes of the persistently high global incidence of new HCV infections (Degenhardt *et al*., 2017).

2.9.2 Epidemiology in Nigeria

HBV in Nigeria

With an estimated 8.1% incidence in the general population, Nigeria is categorized as a high endemic region for HBV (Nwankwo *et al*., 2018). Prevalence rates vary greatly among subgroups, with psychiatric in-patients at 10–15%, healthcare workers at 4–8%, pregnant women at 6–12%, and blood donors at 10–14% (Ofori-Asenso and Agyeman, 2016). Mother-to-child vertical transmission, risky customs like tattooing and scarification, and low vaccination rates, especially in rural areas, are the main causes of Nigeria's high HBV prevalence (Okonko *et al*., 2020).

HCV in Nigeria

According to Babalola *et a*l. (2016), the total prevalence of HCV in Nigeria is predicted to be 1.1% to 2.2%. Higher rates are noted in high-risk groups, including hemodialysis patients (8–14%), psychiatric patients (4–6%), and intravenous drug users (4–8%) (Olorunfemi *et al.,* 2020).

2.9.3 Epidemiology in Psychiatric Institutions

Studies have shown that individuals with serious mental illness (SMI) and those in psychiatric institutional settings are at a high risk for blood-borne viral infections like Hepatitis B (HBV) and Hepatitis C (HCV).Increased incidence of high-risk behaviors (such as substance misuse and unprotected sex), poor hygiene and shared goods (such as razors), and limited access to and vaccination programs are some of the contributing causes. HBV seroprevalence was 12.5% and HCV was 5.1% in Nigerian mental facilities, according to a study by Agunbiade *et al*. (2020). Other low-income nations have also found similar results, underscoring the necessity of routine viral hepatitis screening in mental health facilities. Durotoye *et al*. (2014) reported an HBV seroprevalence of 10.0% and an HCV seroprevalence of 12.6% among psychiatric patients, compared with 10.9% (HBV) and 1.1% (HCV) in blood donors (Durotoye *et al*., 2014). This pattern (markedly higher HCV in psychiatric patients versus community/blood-donor controls) mirrors findings from other regions where HCV risk is strongly linked to substance use and institutional risk factors. Nigeria's overall HBV endemicity is relatively high (national estimates vary by study and region), which influences the background risk for psychiatric populations; nonetheless, the disproportionately elevated HCV prevalence among psychiatric patients in Durotoye *et al.'s* study indicates an institutional amplification of HCV risk (Durotoye *et al*., 2014; Olayinka *et al*., 2016).

2.10 Risk Factors for Hepatitis B and C Virus Infections

2.10.1 Risk Factors for HBV

The age at exposure has a significant impact on the chance of contracting HBV. Up to 90% of chronic HBV infections in children occur during pregnancy, making perinatal transmission the most prevalent route in high-endemic regions such as Southeast Asia and sub-Saharan Africa (Chen, 2015). On the other hand,

intermediate endemic locations are more likely to experience horizontal transmission during early childhood and adolescence.

Additional risk factors specific to HBV include:

- Lack of HBV vaccination, especially among newborns

- Unprotected sex, especially among men who have sex with men (MSM)

- Chronic renal failure, requiring dialysis

- HIV co-infection (UNAIDS, 2019)

2.10.2 Risk Factors for HCV

Unlike HBV, HCV is rarely transmitted sexually or vertically. It is mainly acquired through percutaneous exposures, particularly among:

- Injection drug users (IDUs)—HCV seroprevalence exceeds 50% in many IDU populations (Degenhardt *et al*., 2017)

- Individuals with unsafe medical procedures (e.g., poorly sterilized surgical tools or injections

- Recipients of unscreened blood transfusions before the adoption of routine HCV screening in the 1990s (Petruzziello *et al*., 2016)

HCV risk is also elevated in:

- Prison populations

- Patients undergoing hemodialysis

- Individuals with HIV infection

2.10.3 Risk Factors Among Psychiatric Patients

Patients with psychiatric illnesses face elevated risk of viral hepatitis due to a convergence of behavioral and institutional factors. These include:

- Substance use disorders, particularly injection drug use

- Sexual promiscuity or risky sexual behaviors, sometimes associated with mania or psychosis

- Poor personal hygiene and shared use of razors or needles

- Inadequate medical attention and neglect in mental health institutions

- Infrequent screening or vaccination for HBV and HCV in psychiatric settings

These factors underscore the vulnerability of psychiatric patients and the need for targeted public health interventions.

2.11 Psychiatric Patients and Hepatitis B and C Infection

The area of medicine known as psychiatry is dedicated to the identification, management, and avoidance of mental, emotional, and behavioral disorders. People with severe mental disorders (SMI) such schizophrenia, bipolar disorder, and major depression are frequently among the people receiving care, sometimes known as psychiatric patients (Bauer-Staeb *et al.*, 2017). These patients are at risk because of interrelated institutional, social, and medical problems. A variety of problems having important cognitive, behavioral, and social ramifications are included in the category of psychiatric disorders. SMI patients are at higher risk for health problems. Compared to the general population, those with SMI in Sweden had 2.29 times the odds of contracting HBV and 6.18 times the odds of contracting HCV; substance abuse was a major contributing

factor (Bauer-Staeb *et al*., 2017). Both HBV and HCV prevalence rates were greater in mentally ill people in Nigerian psychiatric settings—for instance, clinic attendees had 10.0% HBV and 12.6% HCV, while blood donors had significantly lower rates (Suleiman *et al*., 2014). Additional risks may be faced by psychiatric patients in inpatient or custodial facilities. For instance, in Nigeria, behaviors like tattooing, scarification, sharing equipment, and clothing were statistically linked to HCV and HBV among psychiatric inpatients (as well as prison inmates) (Abdullahi, 2016). Hepatitis can spread unintentionally in settings when there is overcrowding in the institution, poor infection control, and irregular screening.

A group with complicated and compounded health vulnerabilities is represented by psychiatric patients, especially those in institutional settings. These include difficulties with judgment, self-care, cognitive function, and a rise in risky behaviors such substance misuse and unsafe sexual practices (Fekadu *et al*., 2016). Physical health care, including the screening and treatment of infectious diseases, is frequently deprioritized in psychiatric facilities due to stigma and systematic neglect, making this population more vulnerable to infections like hepatitis B virus (HBV) and hepatitis C virus (HCV). A distinct set of behavioral, social, and systemic characteristics frequently affect people with severe mental illnesses, making them far more susceptible to hepatitis B virus (HBV) and hepatitis C virus (HCV) infections. This increased vulnerability is largely caused by stigma and neglect, since psychiatric patients often face self-stigmatization and public discrimination, which restricts their access to medical care and lowers their priority in national health initiatives (Bauer-Staeb *et al*., 2017; Suleiman *et al*., 2014). In addition to stigma, psychological stresses including homelessness, poverty, and social exclusion make it harder for them to take preventative actions like regular screenings and vaccinations (Suleiman *et al*., 2014).

These difficulties are made worse in places with low resources, such as Nigeria, by structural obstacles to healthcare. Many people lack protection because hepatitis prevention cannot be integrated into psychiatric

care due to severe underfunding of mental health services and a lack of qualified experts (Wikipedia, 2025). Furthermore, a significant pathway for the spread of HCV is substance use disorder, especially injectable drug use, which is disproportionately prevalent in psychiatric populations (Osibogun *et al*., 2020). People with illnesses including schizophrenia and bipolar disorder have also been shown to engage in sexual risk behaviors, such as having several partners and using condoms inconsistently, which increases their exposure risk (Carey *et al.,* 2017).

2.12 Co-Infection of Hepatitis B and C in Psychiatric Patients

Hepatitis B virus (HBV) and hepatitis C virus (HCV) co-infection is not unusual, especially among groups that are more likely to be exposed to risk factors such intravenous drug use, sexual promiscuity, and subpar medical care (Rizzetto and Shouval, 2020). Because the risk factors, consequences, and treatment requirements for these two infections overlap, they might coexist in psychiatric settings and pose special difficulties. Co-infection is a major yet little-known burden in Nigerian mental communities. According to study conducted in mental hospitals in Nigeria as of 2020, more than half of co-infected people were ignorant of their illness, and treatment plans were frequently insufficient since antiviral medications were expensive and there was a shortage of specialized care (Omoruyi *et al*., 2020). Furthermore, the issue is made worse by inadequate healthcare resources and undertrained medical staff, which exposes co-infected psychiatric patients to serious liver illness and declines in mental health.

2.13 Clinical Manifestations of Hepatitis B and C

Asymptomatic to potentially fatal liver illness are the clinical symptoms of Hepatitis B virus (HBV) and Hepatitis C virus (HCV) infections. Although the liver is the target of both viruses, there can be major differences in their course, symptoms, and complications. Some people with chronic HBV or HCV may exhibit symptoms of acute hepatitis, chronic liver disease, or extrahepatic manifestations, although many may go years without showing any symptoms (Thomas, 2020). The identification of clinical manifestations in mental inpatients is more difficult because of drug side effects, diminished self-reporting ability, and symptoms that overlap with psychiatric illnesses (Mason *et al*., 2018).

2.13.1 Clinical Features of Hepatitis B Infection

a. Acute HBV Infection

Within the first six months following exposure, an acute HBV infection can manifest as fever, fatigue, anorexia, nausea and vomiting, abdominal pain in the right upper quadrant, jaundice (in approximately 30% of symptomatic patients), dark urine, and pale stool (Terrault *et al*., 2018). While most adult acute infections resolve on their own with full recovery, 5–10% progress to chronic infection.

b. Chronic HBV Infection

For years, chronic hepatitis B may go undiagnosed. When symptoms appear, they frequently indicate liver disease that is progressing: Chronic exhaustion, hepatosplenomegaly, Ascites (a buildup of fluid in the belly), jaundice, Edema in the periphery, Hepatocellular carcinoma (HCC) risk, particularly in genotype C infections, and cirrhosis symptoms (such as spider angiomas and palmar erythema) (World Health Organization [WHO], 2021).

2.13.2 Clinical Features of Hepatitis C Infection

a. Acute HCV Infection

Only 20–30% of those with an acute HCV infection experience symptoms such low-grade fever, minor stomach discomfort, malaise, jaundice (less prevalent than HBV), and elevated liver enzymes. Most HCV infections are mild or asymptomatic (Alavi *et al.*, 2020).

b. Chronic HCV Infection

About 80% of HCV patients progress to chronicity. The symptoms of chronic HCV include: mild yet ongoing exhaustion, abdominal pain, Extrahepatic symptoms, such as joint discomfort, skin rashes, glomerulonephritis, and mixed cryoglobulinemia, as well as intermittent jaundice (Sarrazin et al., 2017). Similar to HBV, chronic HCV can develop into liver cancer and cirrhosis, frequently without warning over a 20–30 year period.

2.13.3 Clinical Presentation in Psychiatric In-patients

Due to the possibility of unusual, obscure, or underreported clinical symptoms of diseases like hepatitis B and C, psychiatric patients may pose special diagnostic hurdles. Cognitive deficits linked to illnesses such as bipolar disorder and schizophrenia may make it more difficult for them to properly identify, understand, or express physical symptoms. Similar to this, people with serious mental illnesses may be unable to seek early medical assistance due to a lack of insight and decreased self-awareness. Another level of complexity is introduced by the use of psychotropic drugs, which can disguise the early warning signs of viral hepatitis by causing drowsiness or suppressing symptoms (Fakoya *et al.*, 2019). Furthermore, prolonged clinical suspicion and diagnosis may result from the biases of healthcare providers. Early identification possibilities are lost because patients with mental illnesses are frequently labeled as untrustworthy historians or their medical problems may be downplayed (Fakoya *et al*., 2019). These problems are made worse by the fact

that common somatic symptoms of viral hepatitis, like anorexia, exhaustion, and sleep disruptions, commonly coexist with symptoms of mental illnesses. As a result, rather of being identified as possible markers of hepatitis infection, these symptoms are frequently mistakenly linked to underlying mental disorder. Psychiatric patients are more likely to experience difficulties and have poorer health outcomes as a result of this diagnostic overshadowing, which can cause major delays in diagnosis and treatment.

2.13.4 Complications of Untreated Infection

Both hepatitis B virus (HBV) and hepatitis C virus (HCV) infections can lead to serious and sometimes fatal side effects, such as cirrhosis, liver failure, hepatocellular cancer, chronic hepatitis, and eventually death, if treatment is not received (Terrault *et al.,* 2018; WHO, 2021). These results are especially worrisome because liver disease frequently progresses silently, with many patients showing no symptoms until the disease has progressed to a more advanced stage. This emphasizes how crucial routine screening is for early detection and intervention, particularly for high-risk populations like psychiatric inpatients. In addition to improving individual health outcomes, prompt identification and treatment are essential for lowering transmission and averting long-term consequences in this susceptible group.

2.14. Laboratory Diagnosis of Hepatitis B and C

The detection and treatment of acute and chronic illnesses brought on by the hepatitis B and hepatitis C viruses depend heavily on laboratory diagnosis. In addition to verifying the existence of infection, it also helps determine the disease's stage, directs treatment choices, and tracks the effectiveness of therapy. Additionally, early detection is essential for stopping the spread of the disease, especially in high-risk populations like psychiatric inpatients who frequently have several vulnerabilities (Terrault *et al.,* 2018).

Laboratory testing is essential for precise diagnosis and efficient epidemiological surveillance because HBV and HCV infections are often silent, particularly in the early stages (WHO, 2021).

Diagnostic Methods for Hepatitis B

a. Serological Tests

Serological indicators continue to be the mainstay of HBV diagnosis, assisting medical professionals in identifying the immunological status and infection stage. An active HBV infection, whether acute or chronic, is indicated by HBsAg (hepatitis B surface antigen). HBeAg (Hepatitis B e antigen) indicates high levels of viral replication and greater infectivity, Anti-HBs (antibodies to surface antigen) indicate recovery from a previous infection or successful vaccination, and Anti-HBe (antibodies to e antigen) usually indicates lower infectivity and decreased viral replication. IgM, which indicates a recent acute infection, or IgG, which indicates a chronic infection or previous exposure, are examples of anti-HBc (antibodies to core antigen). By combining these indicators, it is possible to interpret the patient's infection status holistically and differentiate between acute, chronic, resolved, and vaccinated states (Terrault *et al.*, 2018).

b. Molecular Tests

Molecular diagnostics provide more accurate disease progression tracking, which is a useful addition to serological testing. Genotyping identifies the particular viral genotype, which can affect treatment decisions, prognosis, and therapeutic outcomes. HBV DNA PCR measures viral load, which is essential for determining the severity of infection and monitoring treatment response.

Diagnostic Methods for Hepatitis C

a. Serological Tests

Anti-HCV antibody testing (ELISA), which detects antibodies against HCV and suggests previous exposure to the virus, is frequently used for the initial screening for HCV infection. Nevertheless, antibody positivity by itself is unable to distinguish between ongoing instances and previously resolved infections.

b. Confirmatory and Molecular Tests

By directly identifying viral RNA in the blood, HCV RNA PCR testing is the gold standard for verifying a current infection. It facilitates the differentiation of ongoing viral replication from resolved infections (Sarrazin *et al.,* 2017). The precise virus genotype is determined by HCV genotyping, which is crucial for estimating treatment duration, choosing medications, and customizing treatment plans.

2.15 Treatment of Hepatitis B and C

Over the past ten years, there has been a dramatic evolution in the treatment of Hepatitis B and Hepatitis C viruses, with novel antiviral treatments providing better efficacy, tolerability, and results. For mental inpatients, who may be at higher risk of illness development because of immunosuppression, substance abuse, malnutrition, or delayed diagnosis, treatment is especially crucial (Fakoya *et al*., 2019). Direct-acting antivirals (DAAs) can currently cure the majority of patients with HCV, whereas HBV treatment concentrates on viral suppression.

2.15.1 Treatment of Hepatitis B

a. Goals of Treatment

In HBV management, the primary objectives are: To inhibit HBV replication, Stop cirrhosis or hepatocellular cancer (HCC) from developing. Attain seroconversion, which is the elimination of HBsAg or

HBeAg accompanied by the development of matching antibodies. Cut down on transmission and infectivity (Terrault *et al*., 2018)

b. First-line Antiviral Agents

The AASLD and WHO guidelines state that tenofovir disoproxil fumarate (TDF), tenofovir alafenamide (TAF), and tecavir (ETV) are preferable agents. These medications have long-term safety records, good tolerability, and a high barrier to resistance. Once a day, they are taken orally (WHO, 2021).

b. Treatment with Interferon

The use of pegylated interferon-α (PEG-IFN-α) is recommended for certain patients, such as young people and those with low virus loads. Side effects include depression, which might worsen mental health issues, limit its use (Lam *et al*., 2020).

d. Duration of Therapy

Many patients, particularly those with cirrhosis, high viral levels, or immunosuppression, may require lifelong HBV treatment. If HBsAg clearance is obtained, discontinuation might be taken into consideration (Terrault *et al*., 2018).

2.15.2 Treatment of Hepatitis C

a. Goals of Treatment

12 weeks following treatment completion, attain sustained virological response (SVR), which is defined as undetectable HCV RNA (Sarrazin *et al*., 2017). Reduced liver-related morbidity, mortality, and transmission are linked to SVR.

b. Direct-Acting Antivirals (DAAs)

Certain proteins essential to HCV replication are targeted by DAAs. NS5A inhibitors (like ledipasvir and velpatasvir), NS5B polymerase inhibitors (like sofosbuvir), and NS3/4A protease inhibitors (like glecaprevir) are the three categories into which they fall. Among the suggested regimens are the pan-genotypic Glecaprevir/pibrentasvir (Mavyret), the pan-genotypic Sofosbuvir/velpatasvir (Epclusa), and the genotype 1-effective Sofosbuvir/ledipasvir (Harvoni). Cure rates for these regimens are over 95%, and they usually last 8 to 12 weeks (WHO, 2021).

c. Benefits in Psychiatric Patients

Modern DAAs, as opposed to interferon-based regimens, show little neuropsychiatric adverse effects. beneficial for patients who have both HIV and HBV co-infections. Cognitive and mental problems associated with chronic HCV have been seen to improve with treatment (Yarlott *et al.*, 2020).

2.15.3 Treatment Challenges in Psychiatric Settings

The National Hepatitis Strategic Plan (2016–2020) sought to increase access to DAAs and integrate hepatitis care into primary healthcare systems, but full implementation is still pending (Federal Ministry of Health [FMOH], 2016). Psychiatric inpatients face a number of treatment barriers, including: Poor adherence due to cognitive deficits or psychosis; Drug–drug interactions with antipsychotics or mood stabilizers; Limited access to specialists and diagnostics; and Stigma and diagnostic overshadowing by mental illness (Fakoya *et al*., 2019).

2.16 Prevention and Control of Hepatitis B and C

Since hepatitis B (HBV) and hepatitis C (HCV) are so common worldwide, thorough preventative and control measures are required. In order to eradicate viral hepatitis as a public health concern by 2030, the World Health Organization (WHO) established a target of 90% fewer new infections and 65% fewer deaths from hepatitis-related causes (WHO, 2021). Public health education, safe medical procedures, harm reduction for drug users, and immunization (for HBV) are all necessary for effective prevention. Poor hygiene, limited access to healthcare, and high-risk behaviors put psychiatric people at greater risk, particularly in institutional settings (Thio *et al.*, 2020).

2.16.1 Prevention of Hepatitis B

a. Vaccination

The mainstay of HBV prophylaxis is the Hepatitis B vaccine. Three doses of the recombinant vaccine are given at 0, 1, and 6 months. In order to prevent transmission from mother to kid, the birth dose is particularly important. After the immunization series is finished, studies demonstrate >90% effectiveness (Chang and Chen, 2022).

b. Global Coverage

Global coverage of the third dosage of the HBV vaccine was about 82% as of 2021; nevertheless, birth dose coverage is still low in many low-income nations (WHO, 2021).

c. Nigerian Context

In 2004, the HBV vaccination was included to Nigeria's national immunization program. Nevertheless, vaccination rates are still below ideal, particularly in underprivileged and rural areas (Olorunfemi and

Adekanle, 2020). Many facilities do not have a regular immunization program for staff or psychiatric inpatients, which raises the possibility of institutional transmission.

2.16.2 Prevention of Hepatitis C

Since there isn't a vaccine for HCV yet, primary preventative measures are essential. Substance abuse, self-harm, and inadequate infection control procedures make prevention in psychiatric settings even more difficult (Yarlott *et al*., 2020).

2.16.3 Infection Control in Psychiatric Settings

Psychiatric inpatients may be exposed to HBV and HCV through; Shared sharp objects, Sexual activity, Exposure to contaminated instruments due to poor sanitation, Unscreened blood transfusions.

Preventive strategies include:

- Routine screening of all psychiatric inpatients and staff for HBV and HCV

- Immunization of non-immune patients and healthcare workers

- Strict adherence to universal precautions (e.g., gloves, proper disposal of sharps)

- Training of psychiatric health workers in infection control (Fakoya *et al*., 2019)

2.16.4 Role of Health Education

To lessen stigma, raise awareness of the risks of transmission, and encourage vaccination uptake, patient and public education is crucial. Health education in psychiatric settings needs to be customized for each patient's mental state and cognitive ability (Osibogun *et al*., 2020).

2.16.5 WHO Recommendations

- Expansion of testing initiatives and harm reduction services

- Including prevention and treatment for hepatitis in mental health services

- Systems for monitoring and assessing vaccination coverage, screening rates, and treatment results (WHO, 2021).

CHAPTER THREE

MATERIALS AND METHODS

3.1 Study Design

A cross-sectional assessment was used to determine the prevalence of hepatitis B and C viral infection among psychiatric patients in Benin City. The study included blood collection and baseline data collection.

3.2 Study Area

The study was conducted at the Federal Neuropsychiatric Hospital, Uselu and the hospital's permanent site at Idowina, Benin City. Benin City is the capital of Edo State which is situated in the South southern part of Nigeria. The hospital has an elevation of about 94 meters (308 feet). It has the coordinates 6°21'38"N 5°37'12" E.

3.3 Study Population

Psychiatric patients whose psychiatric status was already known and were currently admitted into various wards at the Federal Neuropsychiatric Hospital, Uselu and Idomwina were recruited in this study. The participants ages ranged from 18 years to above 50 years.

3.4 Sample Size Determination

The minimum sample size for the study was determined using the World Health Organization standard formula for the calculation of sample size.

$n=Z^2P(1-P)/d^2$

Where:

n - Sample Size

Z - Z- score for 95% confidence level (1.96)

P - Estimated prevalence (assumed to be 5% based on previous studies)

d - Margin of error (5%)

From the prevalence of Hepatitis B and C of 10% = 0.1 (Durotoye *et al*., 2014)

$n= 1.96\times 0.1\times (1- 0.1)/0.05^2$

$n= 138\approx140$

3.5 Ethical Considerations

Ethical approval for this research was obtained from the Research and Ethics Committee at the Federal Neuropsychiatric Hospital, Uselu, Benin City, with ethical approval number 25CERT/CLN/6.271975 (see Appendix I). This study adhered to ethical principles outlined in the Declaration of Helsinki. Informed consent was gotten from all participants, ensuring they understood the study's purpose, procedures, potential risks and benefits. A structured questionnaire was administered to collect bio-data and medical diagnosis of the patients. The participants confidentiality was maintained, with data anonymized and securely stored.

3.6 Inclusion Criteria

Known psychiatric male and female patients aged 18 years and above, psychiatric in-patients admitted to various wards at the Federal Neuropsychiatric Hospital, Uselu and Idomwina, Benin City.

3.7 Exclusion Criteria

Patients with known liver diseases unrelated to Hepatitis B and C (e.g., alcoholic liver disease). Patients below 18 years of age. Patients unwilling to participate in the study

3.8 Sample Collection

A structured questionnaire was administered to collect bio data and medical diagnosis of the patients. Blood samples were then collected in accordance with ethical and safety standards. The procedure is as follows:

1. Patient recruitment and consent: The psychiatric patients who were recruited in this study were those that were stable at the point of sample collection. The participants were briefed on the purpose of the research and what they stand to gain after the course of the study. The participants had a choice to choose if they wanted to partake in the study or not. Those who wanted to participate were recruited.

2. Administration of the questionnaire : Due to their mental condition, the questionnaire was not gotten from them directly. Instead, their data was gotten from their case notes.

3. Collection of 2ml of venous blood sample from the fore arm of the psychiatric patients into a sterile plain container already labeled

3.9 Sample Processing and Analysis

The obtained blood sample in the container was allowed to clot then centrifuged at 3000 revs per minute (rpm) for five minutes. Then the serum was collected and used for analysis. Hepatitis B surface antigen (HBsAG) and HCV was detected using commercially available rapid chromatographic immunoassays for the qualitative detection. The qualitative assays were performed using one-step test strips manufactured by NARROW-CARE and RAPID LIFE, Australia , for the detection of HBsAG and HCV in serum samples. The analysis was performed within one hour of specimen collection and separation was allowed to take place within a few minutes. The results was read at exactly 15 minutes after. Only clear non-haemolyzed serum samples were used for this analysis.

The HBsAG and HCV test kit used was NARROW-CARE and RAPID LIFE rapid kit respectively. The HBsAG kit (NARROW-CARE) has manufacturer's diagnostic sensitivity, specificity and accuracy of 99.9%, >99.9% and 99.9% respectively. While the HCV kit (RAPID LIFE) has a manufacturer diagnostic sensitivity, specificity and accuracy of >99.9%, 98.6% and 99.3% respectively.

3.10 Serological Detection of Viral Hepatitis

The serum was analyzed for HBsAG using NARROW-CARE HBsAG test strip and anti- HCV antibodies using RAPID LIFE HCV test strip. The kits were used according to manufacturer’s instructions.

3.11 Qualitative Detection of Viral Hepatitis

The serum was analyzed for HBsAG using NARROW-CARE HBsAG test strip and anti- HCV antibodies using RAPID LIFE HCV test strip. The kits were used according to manufacturer's instructions.

3.12 Statistical Analysis

The data was analyzed using SPSS version 27. The descriptive statistics was employed in which the prevalence of hepatitis B and C was expressed as percentages with 95% confidence intervals. Chi-square test was used to check for association between hepatitis status and confounders such as age. gender etc. A p-value of <0.05 was considered statistically significant.

CHAPTER FOUR

RESULTS

Table 4.1: **Demographic Characteristics of the Psychiatric Patients.**

A total of 101 psychiatric patients participated in the study. The data shows that the largest age group comprises of participants aged 21-30 years (40.6%), followed by those aged 31-40 years (26.7%) , then 41-50 years (19.8%) and >50 years (10.9%), while the least age group was participants aged <20 years (2%). Males made up a majority of the participants representing (70.3%), while the females accounted for (29.7%). In terms of marital status, most participants were single (80.2%) , the married were (14.8%), the separated (4%), while the divorced had a relatively small number (1%). In terms of religion , most participants were Christians representing (95.6%), while the Muslims (4.7%). For ethnicity, most participants were from Bini and accounted for (37.6 %), followed by Etsako (20.8%), Others which included Igbo and Yoruba (16.8%) ,

Ijaw (12.9%) and the tribe with the least participants is Esan (11.9%). For occupation, most people were unemployed (38.6%), followed by Self-employed (28.7 %), Student (22.8%), Civil servant (5.9%), and the least occupation was that of the Artisans (4.0%).

Table 4.1: Demographic Characteristics of Study Participants

Variables	Frequency	Percentage
Age		
<20	2	2.0%
21-30	41	40.6%
31-40	27	26.7%
41-50	20	19.8%
>50	11	10.9%
Total	101	100%
Gender		
Female	30	29.7%
Male	71	70.3%
Total	101	100%
Marital status		

Married	15	14.8%
Seperated	4	4.0%
Single	81	80.2%
Widowed	1	1.0%
Total	101	100%
Religion		
Christian	97	96.0%
Muslim	4	4.0%
Total	101	100%

Variables	**Frequency**	**Percentage**
Ethnicity		
Bini	38	37.6%
Esan	12	11.9%
Etsako	21	20.8%
Ijaw	21	12.9%
Others	17	16.8%
Total	101	100%
Occupation		
Artisan	4	4.0%
Civil servant	6	5.9%
Self employed	29	28.7%
Student	23	22.8%
Unemployed	39	38.6%

Total	101	100%
Primary Psychiatric Diagnosis		
Bipolar Affective Disorder(BAD)	6	5.9%
Bipolar Type 1 Disorder (BT1D)	4	4.0%
Mental Behavioral Disorder(MBD)	49	48.5%
Recurrent Depressive Disorder(RD)	3	3.0%
Schizophrenia (SCHY)	39	38.6%
Total	101	100%

Table 4.2: Relationship between Demographic Characteristics and Primary Psychiatric Diagnosis of Psychiatric Patients at Federal Neuropsychiatric Hospital, Benin City.

Different participants with different demographic characteristics had different psychiatric diagnosis. In respect to Age, <20 had BAD(50%),MBD(50%),21-30 had majority MBD(48.2%), 31-40 had majority MBD (48.2%), 41-50 had majority SCHY (55%), >50 had MBD (36.3%). Based on Ethnicity, Bini had majotity SCHY (44.7%), Esan had MBD (41.7%), SCHY (41.7%), Etsako had majoreity MBD (42.9%), Ijaw had MBD (53.8), Other tribes had MBD (76.5%).. Based on Gender. Females had majority SCHY (66.7%), Males had majority MBD (54.9%). For Marital status, Married had MBD (40%), SCHY (40%), Separated had MBD (50%), SCHY (50%), Single had majority MBD (50.6%),Widowed had majority BAD (100%), Occupation had majority MBD (100%), Civil Servant had majority SCHY (83.3%), Self- employed had majority MBD(51.7%), Student had majority MBD (69.5%),Unemployed had majority SCHY (53.9%). For Religion, Christian had majority MBD (48.6%), Muslim had MBD (50%), SCHY (50%).

Table 4.2: Relationship between Demographic Characteristics and Primary Psychiatric Diagnosis of Psychiatric In-Patients at Federal Neuropsychiatric Hospital, Benin City.

Demographic Characteristics	Primary Psychiatric Diagnosis					Total (%)
Variables	**BAD(%)**	**BT1D(%)**	**MBD(%)**	**SCHY(%)**	**RD(%)**	
Age (years)						
< 20	1(50.0)	0(0)	1(50.0)	0(0)	0(0)	2(1.98)
21-30	1(2.4)	1(2.4)	24(58.5)	14(34.1)	1(2.4)	41(40.6)
31-40	1(3.7)	1(3.7)	13(48.2)	11(40.7)	1(3.7)	27(26.7)
41-50	1(5.0)	1(5.0)	7(35.0)	11(55.0)	0(0)	20(19.8)
>50	2(18.2)	1(9.1)	4(36.3)	3(27.3)	1(9.1)	11(10.9)
Total						101(100)

Ethnicity						
Bini	2(5.2)	1(2.6)	15(39.5)	17(44.7)	0(0)	38(37.6)
Esan	3(25.0)	0(0)	5(41.7)	5(41.7)	1(2.6)	12(11.9)
Etsako	0(0)	2(9.5)	9(42.9)	6(28.6)	0(0)	21(20.8)
Ijaw	0(0)	0(0)	7(53.8)	5(38.5)	1(7.7)	13(12.9)
Others	1(5.8)	1(5.8)	13(76.5)	4(23.5)	1(5.8)	17(16.8)
Total						101(100)
Gender						
Female	1(3.3)	0(0)	9(30.0)	20(66.7)	0(0)	30(29.7)
Male	5(7.0)	4(5.6)	39(54.9)	19(26.8)	3(4.2)	71(70.3)
Total						101(100)

Demographic Characteristics	**Primary Psychiatric Diagnosis**					**Total (%)**
Variables	**BAD(%)**	**BT1D(%)**	**MBD(%)**	**SCHY(%)**	**RD(%)**	
Marital status						
Married	0(0)	1(6.7)	6(40.0)	6 (40.0)	2(13.3)	15(14.8)
Separated	0(0)	0(0)	2(50.0)	2(50.0)	0(0)	4(4.0)
Single	5(6.2)	3(3.7)	41(50.6)	31(38.3)	1(1.2)	81(80.2)
Widowed	1(100)	0(0)	0(0)	0(0)	0(0)	1(1.0)
Total						101(100)
Occupation						
Artisan	0(0)	0(0)	4 (100)	0(0)	0(0)	4(4.0)
Civil servant	1(16.7)	0(0)	0(0)	5(83.3)	11(37.9)	6(5.9)
Self-employed	0(0)	1(3.5)	15(51.7)	11(37.9)	2(6.9)	29(28.7)
Student	3(13.0)	1(4.4)	16(69.5)	2(8.7)	1(4.4)	23(22.8)

Unemployed	2(5.1)	2(5.1)	14(35.9)	21(53.9)	0(0)	39(38.6)
Total						101(100)
Religion						
Christian	6(6.2)	4(4.1)	47(48.6)	37(38.1)	3(3.1)	97(96.0)
Muslim	0(0)	0(0)	2(50.0)	2(50.0)	0(0)	4(4.0)
Total						101(100)

Table 4.3: Prevalence of HBV and HCV among Psychiatric In-Patients at the Federal Neuro Psychiatric Hospital, Benin City.

Hepatitis B virus (HBV) status among the study participants indicated that a very small percentage of individuals were HBV positive (2.97%), while the majority were negative (97.03%). For Hepatitis C virus (HCV), no individual tested positive (0%).

Table 4.3: **Prevalence of HBV and HCV among Psychiatric In-Patients at the Federal Neuropsychiatric Hospital, Benin City.**

Infection	Number of patients examined (%)	Negative (%)	Positive (%)
HBV	101(100)	98(97.03)	3(2.97)
HCV	101(100)	101(101)	0(0)

Table 4.4: Relationship between Primary Psychiatric diagnosis and HBV status of Psychiatric In-patients at Federal Neuropsychiatric Hospital, Benin City.

The association between primary psychiatric diagnosis and HBV status showed no significant relationship (p= 0.2871). However, psychiatric patients with schizophrenia had a higher HBV positivity followed by Mental Behavioral Disorder. Other psychiatric conditions showed no significant HBV positivity.

Table 4.4: Relationship between Primary Psychiatric diagnosis and HBV status of Psychiatric In-Patients at Federal Neuropsychiatric Hospital, Benin City.

Diagnosis	Positive (%)	Negative (%)	Chi-square	p value
Bipolar Affective Disorder (BAD)	0(0)	6(100)	1.1331	0.2871
Bipolar Type 1 Disorder (BT1D)	0(0)	4(100)		
Mental Behavioral disorder (MBD)	1(2.1)	48(97.9)		
Recurrent depressive disorder (RD)	0(0)	2(100)		
Schizophrenia	2(5.1)	37(94.9)		

Table 4.5: Relationship between Demographic Characteristics, Primary Psychiatric Diagnosis and HBV Status of Psychiatric Patients at Federal Neuropsychiatric Hospital, Benin City.

The association shows that the relationship between Age , Gender, Occupation, Religion with primary psychiatric diagnosis and HBV positivity was not significant (p= 0.0791, p= 0.2530, p= 0.1972, p= 0.7211). Although, Ethnicity was statistically associated with primary psychiatric diagnosis and HBV positivity as the major percentage, 7.9% of the participants who are Bini tested positive for HBV ($\chi 2$=5.126, p= 0.0236). Marital status showed a significant association as Married participants had a major percentage of 13.3% which tested positive for HBV ($\chi 2$= 6.5891, p=0.0103).

Table 4.5: Relationship between Demographic Characteristics, Primary Psychiatric Diagnosis and HBV Status of Psychiatric In- Patients at Federal Neuropsychiatric Hospital, Benin City.

Demographic Characteristics	Primary Psychiatric Diagnosis					HBV Status		Chi-square	P value
Variables	**BAD (%)**	**BT1D (%)**	**MBD (%)**	**SCHY (%)**	**RD (%)**	**Positive (%)**	**Negative (%)**		
Age (years)									
< 20	1(50.0)	0(0)	1(50.0)	0(0)	0(0)	0(0)	2(100)	3.0824	0.0791
21-30	1(2.4)	1(2.4)	24(58.5)	14(34.1)	1(2.4)	0(0)	41(100)		
31-40	1(3.7)	1(3.7)	13(48.2)	11(40.7)	1(3.7)	1(3.7)	26(96.3)		
41-50	1(5.0)	1(5.0)	7(35.0)	11(55.0)	0(0)	1(5.0)	19(95.0)		
>50	2(18.2)	1(9.1)	4(36.3)	3(27.3)	1(9.1)	1(9.1)	10(90.9)		

Ethnicity									
Bini	2(5.2)	1(2.6)	15(39.5)	17(44.7)	0(0)	3(7.9)	35(91.1)	5.126	0.0236*
Esan	3(25.0)	0(0)	5(41.7)	5(41.7)	1(2.6)	0(0)	12(100)		
Etsako	0(0)	2(9.5)	9(42.9)	6(28.6)	0(0)	0(0)	21(100)		
Ijaw	0(0)	0(0)	7(53.8)	5(38.5)	1(7.7)	0(0)	13(100)		
Others	1(5.8)	1(5.8)	13(76.5)	4(23.5)	1(5.8)	0(0)	17(100)		

Demographic Characteristics	**Primary Psychiatric Diagnosis**					**HBV Status**		**Chi-square**	**P value**
Variables	**BAD (%)**	**BT1D (%)**	**MBD (%)**	**SCHY (%)**	**RD (%)**	**Positive (%)**	**Negative (%)**		
Gender									
Female	1(3.3)	0(0)	9(30.0)	20(66.7)	0(0)	0(0)	30(100)	1.3064	0.2530
Male	5(7.0)	4(5.6)	39(54.9)	19(26.8)	3(4.2)	3(4.2)	68(95.8)		
Marital status									
Married	0(0)	1(6.7)	1(6.7)	6 (40.0)	2(13.3)	2(13.3)	13(86.7)	6.5891	0.0103*
Separated	0(0)	0(0)	0(0)	2(50.0)	0(0)	0(0)	4(100)		
Single	5(6.2)	3(3.7)	3(3.7)	31(38.3)	1(1.2)	1(1.2)	80(98.8)		
Widowed	1(100)	0(0)	0(0)	0(0)	0(0)	0(0)	1(100)		

Occupation									
Artisan	0(0)	0(0)	4 (100)	0(0)	0(0)	0(0)	4(100)	1.6633	0.1972
Civil servant	1(16.7)	0(0)	0(0)	5(83.3)	11(37.9)	0(0)	6(100)		
Self-employed	0(0)	1(3.5)	15(51.7)	11(37.9)	2(6.9)	1(3.4)	28(96.5)		
Student	3(13.0)	1(4.4)	16(69.5)	2(8.7)	1(4.4)	0(0)	23(100)		
Unemployed	2(5.1)	2(5.1)	14(35.9)	21(53.9)	0(0)	2(5.1)	37(94.9)		
Religion									
Christian	6(6.2)	4(4.1)	47(48.6)	37(38.1)	3(3.1)	3(3.1)	94(96.9)	0.1274	0.7211
Muslim	0(0)	0(0)	2(50.0)	2(50.0)	0(0)	0(0)	4(100)		

CHAPTER FIVE

DISCUSSION AND CONCLUSION

Viral Hepatitis is a significant problem in Nigeria, with Hepatitis B being particularly concerning because of its high incidence. A distinct demographic category with a higher risk of contracting Hepatitis B and Hepatitis C infections is psychiatric inpatients. The study's results demonstrate how common Hepatitis B and Hepatitis C viruses are among in-patients at Federal Neuropsychiatric Hospital in Uselu, Benin City. A total of 101 psychiatric in-patients were evaluated for HBsAg in this study, and the prevalences were 2.97% (3/101) and 0% (0/101) for anti-HCV. While the anti-HCV prevalence was found to be greater, the HBV prevalence among newly admitted patients with psychosis is quite close to the result reported by Omoaregba *et al*. (2013). This implies time trends in HCV exposure or local heterogeneity across centers. Durotoye *et*

al. (2014) also showed significantly higher Ilorin HBV levels; among psychiatric patients. HBsAg was 10.0% and anti-HCV was 12.6%. According to his study, Nigeria has notable between-center heterogeneity. Local epidemiology, admission case-mix (e.g., substance use prevalence), blood-safety history, or methodology (sample size, tests utilized) can all contribute to discrepancies.

The largest age group in this study was 21–30 years old (40.6%), followed by 31–40 years old (26.7%). The proportion of men was 70.3%, while the percentage of women was 29.7%. The majority (80.2%) were unmarried, 96% were Christians, and the largest ethnic group (37.6%) under study was Bini. The most prevalent groups in this study were self-employed people (28.7%) and unemployed people (38.6%). Additionally, the study is male-predominant and dominated by young adults. In low- or middle-income countries, psychiatric inpatient populations frequently contain a high percentage of males and young adults due to the prevalence of severe mental illnesses (such as mania and psychosis) in younger adulthood. Similar age and sex concentrations among psychiatric patients at a tertiary psychiatric hospital in Benin City were reported by James *et al*. (2019). High rates of unemployment and single status are consistent with numerous studies that demonstrate that severe mental illness is linked to disruptions in social and professional life; this socioeconomic vulnerability creates an indirect risk environment for blood-borne infections by limiting access to preventive care (Hughes *et al*., 2016). In some situations, risk behaviors (substance use, sexual risk) that enhance HBV/HCV exposure might still be present in younger, unmarried, unemployed psychiatric inpatients. This helps explain why screening programs frequently target psychiatric settings as they have an high risk of infection due to a lot of risky practices. (Dinwiddie *et al*., 2003; Hughes *et al*., 2016).

Mental and behavioral disorders (MBD 48.5%) and schizophrenia (38.6%) accounted for the majority of diagnoses. There is some heterogeneity in the distribution by age, ethnicity, gender, and occupation; MBD

is greater among students and self-employed individuals in the sample, while schizophrenia is higher in the older age bands. According to James *et al.* (2019), severe psychosis and mood disorders frequently necessitate admission, and the prevalence of schizophrenia and other severe mental disorders among in-patients is consistent with the psychiatric inpatient case-mix documented in Nigerian hospital series. In line with meta-analytic findings that risk clusters with behavior, this implies that diagnoses are distributed across demographics and that risk may be distributed rather than concentrated in a particular diagnostic group (Hughes *et al*., 2016).

There was no statistically significant correlation between HBV status and primary psychiatric diagnosis (χ^2 = 1.133, p = 0.2871). The few HBV positives were dispersed among diagnostic categories in absolute terms. Similar findings were made by Durotoye *et al*. (2014), who focused on community and institutional factors and reported HBV/HCV across psychiatric diagnostic groupings without citing a particular illness to explain the burden in Ilorin. That pattern is seen in this study. Hughes *et al*. (2016) discovered that behavioral risk factors (such as injection drug use, high-risk sex, and homelessness) account for a large portion of the variation in blood-borne virus prevalence, rather than the diagnosis itself (such as schizophrenia vs. bipolar disorder). Therefore, the absence of a correlation between diagnosis and HBV in this study is consistent with the larger body of literature, which holds that a diagnosis is not a reliable independent predictor unless it indicates particular behaviors.

There was no significant correlation between HBV status and age, gender, occupation, or religion (p-values > 0.05). A statistically significant correlation was found between ethnicity and HBV positivity (χ^2=5.126, p=0.0236), with Bini participants having the highest percentage (7.9% within that group). Additionally important was marital status (χ^2=6.5891, p=0.0103), as married participants had a greater proportion of HBV positive (13.3%). Ethnic disparities in HBV prevalence can result from geographic, cultural, or

household characteristics clustered by ethnicity (e.g., scarification, traditional methods, differential vaccination uptake, or familial clustering of infection) (Olayinka *et al.,* 2016). A systematic analysis of HBV epidemiology has extensively demonstrated geographical and ethnic variability in Nigeria (Olayinka *et al.,* 2016; Ajuwon *et al*., 2021). Therefore, the finding that Bini participants exhibited higher HBV positive may be a reflection of differential vaccine access and patterns of transmission in the local population.

There must be targeted local follow-up. Given that sexual transmission of HBV is a significant pathway in adults and that household (spousal) transmission might result in infections in adulthood if vaccination coverage is insufficient, a higher frequency of HBV among married individuals is epidemiologically feasible (Chen, 2009). Numerous epidemiologic investigations have revealed similar results (associations between marital/household variables and HBV). This backs public health initiatives including household immunization and partner testing.

CONCLUSION

This study recorded that 2.97% of the participants tested positive for HBV while no participants tested positive for HCV.HBV infection showed no relationship with psychiatric diagnosis, but ethnicity and marital status were significant predictors. Overall, the findings highlight the importance of sustaining HBV vaccination programs, implementing routine hepatitis screening in psychiatric facilities, and promoting partner/family testing and vaccination to further reduce transmission. Strengthened molecular diagnostic approaches will be valuable in refining prevalence estimates and guiding targeted interventions for this vulnerable group.

LIMITATION

1. Small sample size: Only 101 participants were included, with just three HBV positives. This limited the statistical power of subgroup analyses and produced wide confidence intervals for prevalence estimates. Larger samples are needed to improve precision and detect smaller associations.

2. Low number of samples collected due to non-consenting participants.

3. Cross-sectional design: The study measured exposure at one point in time. It cannot establish temporality or identify new virus chronic infections, nor can it assess incidence or transmission dynamics.

RECOMMENDATION

1. Routine hepatitis screening in mental health facilities: RDTs should be used to screen for HBV and HCV in all psychiatric in-patients upon admission, and ELISA or molecular confirmation should be used for positive results.
2. Incorporation of HBV vaccination into mental health services: Staff members and patients who are not immune to the virus should be given the opportunity to receive the HBV vaccination. HBV-positive patients' partners and household contacts should also be checked and, if necessary, vaccinated.
3. Strengthen infection-prevention procedures: To lower the danger of iatrogenic transmission, psychiatric facilities should make sure that universal precautions are strictly followed, that safe injection procedures are followed, and that instruments are sterilized.

4. Health education and counseling: Patients and caregivers should be specifically educated about the transmission of HBV and HCV, with a focus on the necessity of vaccination, safe sexual behaviors, and avoiding sharing sharp items.
5. Expand multi-center research: Larger, multi-center studies with ELISA/PCR confirmation and inclusion of behavioral risk-factor data are needed to better define HBV/HCV burden in Nigerian psychiatric populations.
6. Policy and programmatic action: The Federal Ministry of Health and hospital management should integrate viral hepatitis services (screening, vaccination, and counseling) into existing mental health programs as part of Nigeria's National Viral Hepatitis Control Strategy.

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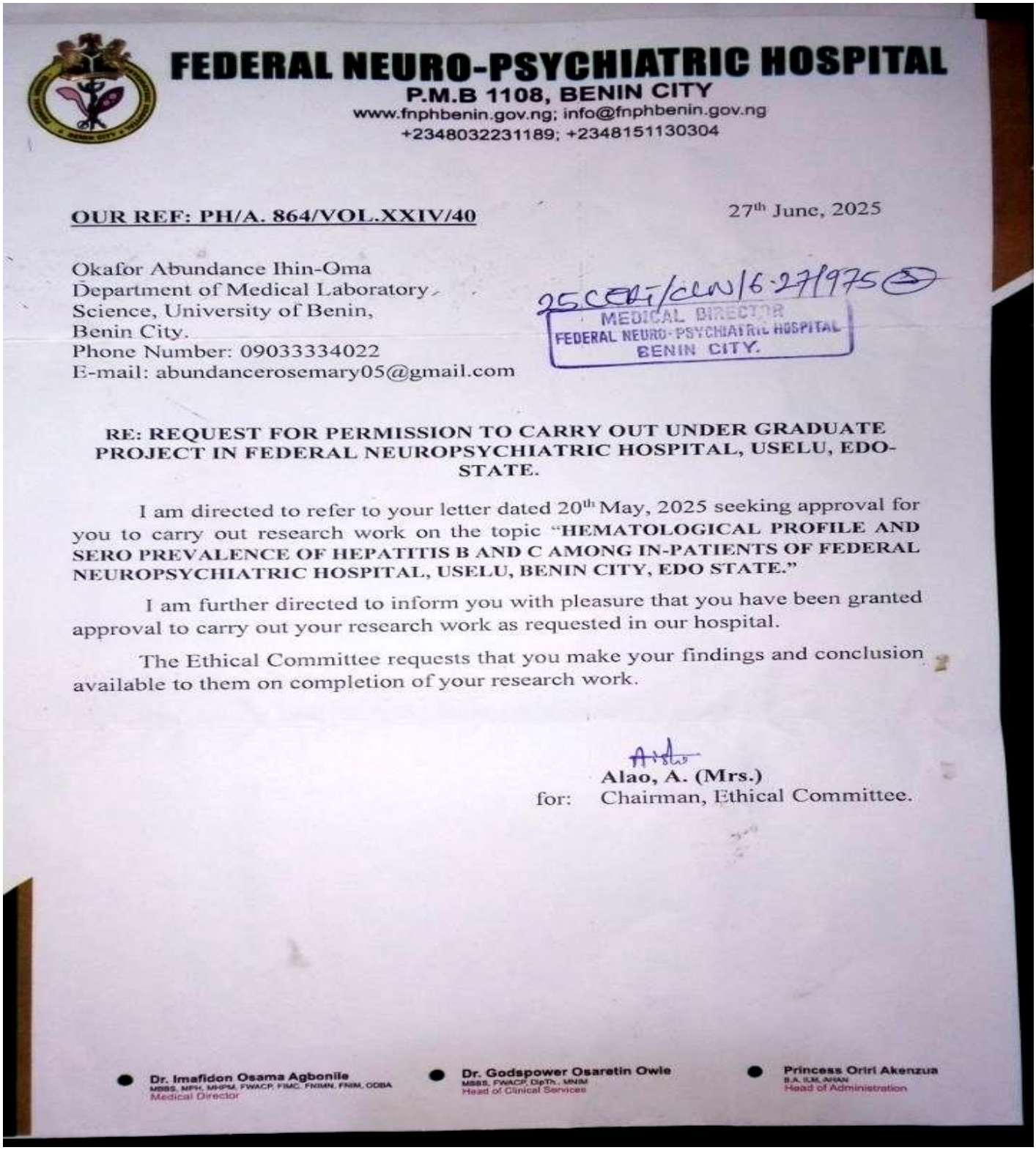
APPENDIX I



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OUR REF: PH/A. 864/VOL.XXIV/40

27th June, 2025

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25CEM/CLN/6-27/975

MEDICAL DIRECTOR
FEDERAL NEURO-PSYCHIATRIC HOSPITAL
BENIN CITY.

RE: REQUEST FOR PERMISSION TO CARRY OUT UNDER GRADUATE PROJECT IN FEDERAL NEUROPSYCHIATRIC HOSPITAL, USELU, EDO-STATE.

I am directed to refer to your letter dated 20th May, 2025 seeking approval for you to carry out research work on the topic "**HEMATOLOGICAL PROFILE AND SERO PREVALENCE OF HEPATITIS B AND C AMONG IN-PATIENTS OF FEDERAL NEUROPSYCHIATRIC HOSPITAL, USELU, BENIN CITY, EDO STATE.**"

I am further directed to inform you with pleasure that you have been granted approval to carry out your research work as requested in our hospital.

The Ethical Committee requests that you make your findings and conclusion available to them on completion of your research work.

Alao, A. (Mrs.)
for: Chairman, Ethical Committee.

APPENDIX II

INFORMED CONSENT FORM

Study Title:

Sero-Prevalence of Hepatitis B and C Among In-Patients of Federal Neuropsychiatric Hospital, Uselu, Benin City

Principal Investigator

Name: OKAFOR ABUNDANCE IHIN-OMA

Address: Department of Medical Laboratory Science, School of Basic Medical Sciences, University of Benin , Benin City, Edo State, Nigeria

Telephone: 09033334022

Email: abundancerosemary05@gmail.com

Contact Information for Questions or Emergencies

If you have any questions about the study or in case of a research-related injury or emergency, please contact:

Name: Mrs Betty Odeh

Address: Federal Neuropsychiatric Hospital, Uselu, Benin City

Telephone: +234l8085243378

Email: bettyodeh1@gmail.com

Ethics Review Committee Contact Information:

Name of Committee: Dr Oluyemi O. Akanni, Chairman, Ethics Review Committee, Federal Neuropsychiatric Hospital, Useluyj

Address: Federal Neuropsychiatric Hospital, Uselu, Benin City, Edo State, Nigeria

Telephone: +2347035227045

Email: oluyemiakanni@fnphbenin.gov.ng

Purpose of the Research

This study aims to examine the presence of Hepatitis B and C among in-patients. The results will help understand the prevalence and impact of these infections, contributing to improved patient care and health

policy. Results will be shared via scientific publications, hospital reports, and conferences without including any participant names.

Procedures

If you agree to participate, you will:

Provide a small blood sample (about 5mls) taken from your arm by a trained professional.

Complete a short questionnaire about your health history (10–15 minutes).

All procedures will occur at the Federal Neuropsychiatric Hospital, Uselu, in a private and safe environment. You may ask questions at any time.

Expected Benefits

-Free screening for Hepatitis B and C

-Contribution to improved medical understanding and care for others

Note: There is no guarantee of direct personal benefit.

Foreseeable Risks or Discomforts

Mild pain, bruising, or swelling at the blood draw site

Some personal or sensitive questions may be asked in the questionnaire

Any unknown risks will be monitored, and you will be informed of any new findings during the study.

Time Commitment

Your participation will require about 20–30 minutes for the blood sample and questionnaire. If follow-up is needed, it will not exceed an additional 30 minutes.

Treatment for Adverse Events

In case of any study-related adverse events, such as an infection or severe bruising, you will receive free treatment at the hospital. The research team will cover all associated costs.

Privacy and Confidentiality

Your data will be kept strictly confidential:

-Stored in locked cabinets or password-protected systems

-Accessible only by authorized research staff

-Identified by a unique code (not your name)

-Your personal details will not appear in any report or publication. You may ask about your data protection at any time.

Voluntary Participation

Participation is voluntary. You may decline or withdraw at any time without affecting your medical care or access to hospital services.

Certificate of Consent

I have read this form, or it has been read to me in a language I understand. I have had the opportunity to ask questions, and all my questions have been answered to my satisfaction. I voluntarily agree to participate in this research study.

Participant's Name : _____

Signature or Thumbprint: _____

Date: _____

Researcher's Name : _____

Signature: _____

Date: _____

Witness (if applicable):

Name: _____

Signature: _____

Date: _____

APPENDIX III

QUESTIONNAIRE ON SERO-PREVALENCE OF HEPATITIS B AND C AMONG IN-PATIENTS OF FEDERAL NEUROPSYCHIATRIC HOSPITAL, USELU, BENIN CITY, EDO STATE

This questionnaire is for research purposes only and is confidential l.Please provide accurate information to the best of your knowledge.

For patients: Participation is voluntary, and you may withdraw at any time.

Demographic Information

Patient ID/Study Code: _____

Age:[ ] 18–25 years[ ] 26–35 years[ ] 36–45 years[ ] 46–55 years[ ] 56 years and above

Gender:[ ] Male[ ] Female[ ]

Marital Status:[ ] Single[ ] Married[ ] Divorced[ ] Widowed

Educational Level:[ ] No formal education[ ] Primary education[ ] Secondary education[ ] Tertiary education

Occupation:[ ] Unemployed[ ] Student[ ] Self-employed[ ] Civil servant[ ] Other (Specify): _____

Primary Psychiatric Diagnosis:[ ] Schizophrenia[ ] Bipolar disorder[ ] Depression[ ] Substance use disorder[ ] Other (Specify): _____


Narrow-Care