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Prevalence of Hepatitis B among Women of Child Bearing Age in Asokoro District Hospital

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Abstract

Hepatitis B virus (HBV) is a blood borne virus that can be found in low concentrations in semen, vaginal fluids, saliva, tears, sweat, and urine and breast milk. The virus is 100 times more infectious than HIV and can live outside the body for seven days. In areas of high prevalence, HBV is generally transmitted from mother to child (prenatal or vertical transmission) during childbirth rather than via the placenta. Transmission from child to child (horizontal transmission) is also common in African countries.

Statistical data was collected from the microbiology unit in of the laboratory department method of test was Rapid Determinant of HBsAg in serum. Data collected was analyzed and categorized. All age groups for the past 3 years have shown a high prevalence with 2019 showing a collective prevalence of 13.25%, 2020 and 2021 showed a prevalence of 11.6% and 11.8% respectively. It was observed that Vertical Transmission of the Hepatitis B virus still remains one of the most likely means of transmission. And that in relation to other studies Abuja still remains a part of Nigeria with high prevalence and those Male carriers remain a major contribution to the spread of the epidemic.

Keywords

Hepatitis B; Women; Child; Asokoro; HBsAg.

Introduction

About 2 billion people worldwide have been infected with Hepatitis B Virus (HBV). An estimated 360 million people remain chronically infected with 2 million deaths annually. Hepatitis B viral infections are caused by the HBV; an envelope virus containing a partially double stranded circular DNA genome and classified within the family hepadnaviridae [1]. HBV infects the liver, thereby impairing liver functions as the virus replicates within the hepatocytes during acute and chronic phases of HBV infections [2]. With Africa and Asia having the highest prevalence and Africa ranking second on vertical transmission of the virus. Hepatitis B virus (HBV) is a partially double-stranded DNA virus, a species of the genus Orthohepadnavirus and a member of the Hepadnaviridae family of viruses [3,1]. This virus causes the disease hepatitis B [4]. Despite there being a vaccine to prevent Hepatitis B, HBV remains a global health problem. Hepatitis B can be acute and later become chronic, leading to other diseases and health conditions. In addition to causing hepatitis, infection with HBV can lead to cirrhosis and hepatocellular carcinoma [5,2]. The virus is divided into four major serotypes (adr, adw, ayr, ayw) based on antigenic epitopes present on its envelope proteins. These serotypes are based on a common determinant (a) and two mutually exclusive determinant pairs (d/y and w/r). The viral strains have also been divided into ten genotypes (A–J) and forty subgenotypes according to overall nucleotide sequence variation of the genome. The genotypes have a distinct geographical distribution and are used in tracing the evolution and transmission of the virus. Differences between genotypes affect the disease severity, course and likelihood of complications, and response to treatment [6].

The virus particle consists of an outer lipid envelope and an icosahedral nucleocapsid core composed of protein. The nucleocapsid encloses the viral DNA and a DNA polymerase that has reverse transcriptase activity similar to retroviruses. The outer envelope contains embedded proteins which are involved in viral

binding of, and entry into, susceptible cells. The virus is one of the smallest enveloped animal viruses with a virion diameter of 42 nm, but pleomorphic forms exist, including filamentous and spherical bodies lacking a core. These particles are not infectious and are composed of the lipid and protein that forms part of the surface of the virion, which is called the surface antigen (HBsAg), and is produced in excess during the life cycle of the virus. HBV is a bloodborne virus that can be found in low concentrations in semen, vaginal fluids, saliva, tears, sweat, urine and breast milk. The virus is 100 times more infectious than HIV and can live outside the body for seven days. In areas of high prevalence, HBV is generally transmitted from mother to child (perinatal or vertical transmission) during childbirth rather than via the placenta [3]. Transmission from child to child (horizontal transmission) is also common. The tradition of scarification may also be a significant source of transmission in African countries [6]. In countries with a low HBV prevalence, the condition tends to affect mainly young adults and is usually transmitted through injecting drug use or unprotected sexual contact [2].

Materials and Methods

Research design

This study was an observational study carried out to determine the prevalence of Hepatitis B Virus amongst child bearing women in Asokoro district hospital.

Data sampling and sources

Data used for this research work was gotten from the records of the medical microbiology unit of Asokoro district hospital laboratory department.

Area and population of study

This study was carried out with Asokoro district hospital restricted to the patient that visited the hospital during the selected time interval.

Procedures

Test was performed according to manufacturer instruction of Rapid Determine test of HBsAg. Twenty-five (25) micro liters of serum was added to the specimen well of the RDTs with the aid of pipette. The serum reacted with the particle coated with monoclonal anti-HBsAg. The mixture then migrates upward along the membrane by capillary action and reacts with polyclonal anti-HBsAg, which are pre-coated on the test region. After 5 minutes, invisibility of the control line indicated invalid result. The presence of two distinct lines in both the control and test regions indicated a positive result while one red line in the control region is a negative result.

Results

In the year 2019, 652 age group (15 – 24) female patients were tested for HBsAg using RDT, 50 tested positives for HBsAg, 1435 female patients of Age groups (25-33) were tested, 186 tested positive. 989 female patients of age groups (34 – 42) were tested, 143 tested positive, 445 female patients age groups (43 – 49) were tested, 73 tested positive.

Ages	15 – 24			25 - 33			34 – 42			43 -49		
Month	Total Tested	POS	NEG	Total Test	POS	NEG	Total Test	POS	NEG	Total Test	POS	NEG
January	51	5	46	78	5	73	62	8	58	14	2	12
February	37	2	35	113	12	101	67	9	58	18	2	16
March	57	7	50	121	15	116	57	5	52	25	2	23
April	48	6	42	98	8	90	70	6	64	27	2	25
May	49	2	47	85	8	77	67	10	57	13	1	12
June	58	6	52	137	16	121	96	11	85	32	7	25
July	40	3	37	123	21	102	83	11	82	18	3	15
August	18	1	17	25	2	23	20	4	16	8	1	7
September	19	1	18	37	5	32	23	1	22	13	3	10
October	27	3	24	87	13	64	59	8	51	20	4	16
November	43	5	38	103	17	84	81	12	69	23	5	18
December	18	1	17	84	6	78	52	6	46	15	-	15
TOTAL	465	42	423	1091	128	963	737	91	646	226	32	194

Table 1: Prevalence of hepatitis B virus infections amongst women child bearing age (15-49) in 2021.

Age group	Number tested	Positive (RDT)	Prevalence (%)
15-24	192	17	8.8
25-33	623	57	9.1
34-42	438	48	10.9
43-49	91	16	17.5
TOTAL	1344	138	10.3

Table 2: Age group distribution of women of child bearing age with HBV infections in 2020.

Sex	Number tested	Positive (RDT)	Prevalence (%)
Females	4228	487	11.5
Males	2897	662	22.9
Total	7125	1149	16.1

Table 3: Prevalence of hepatitis b virus infection amongst male and female patients (2020-2022).

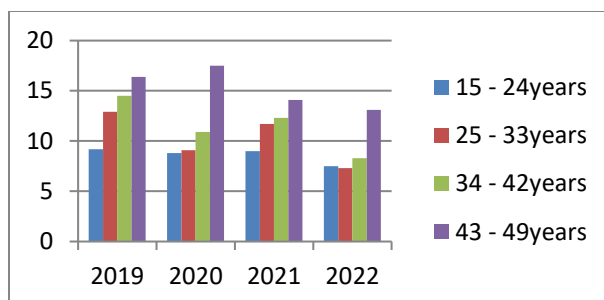


Figure 1: Prevalence of Hepatitis virus 2019 - February, 2022 in Asokoro district hospital.

Discussion

According to the WHO criteria, the prevalence $>8.0\%$ is said to be high, and all age groups for the past 3 years has shown a high prevalence with 2019 showing a collective prevalence of women of childbearing age at 13.25% , 2020 and 2021 showed a prevalence of 11.6% and 11.8% respectively. Compared to 2019 we could notice a slight decline in prevalence, 2020 being affected by the COVID 19 pandemic could have altered the statistics generated giving to the fact that Asokoro district hospital was one of the isolated centers for COVID patients reduced the flow of routine patients throughout the year [6].

When analyzing the age group, it was observed that age group between 34 – 42 years had majority of patients whom were pregnant, second on the pool was age group 25 – 33, 15 – 24 and lastly 43 – 49. Statistically Age group 43 – 49 had a higher prevalence in all the years, this could be due to the fact it has been reported that the severance of Hepatitis B infection is age related (i.e. the older an infected person the more likely it would be to develop symptoms and can lead to a chronic state of infection), therefore having the need to be hospitalized, most hospitalized patients fall within this age group [3]. The second most prevalent age group 34 – 42, corresponded to the fact that Africa is the second continent with the highest rate of vertical transmissions after Asia.

Nigeria is still on WHO radar of high prevalence according to latest research done in 2021, and Hepatitis B virus is said to be an epidemic in Africa. Should trigger a public health response to reduce the prevalence especially in the north states of Nigeria where higher prevalence has been recorded [1].

To promote future research, and subsequent high-quality translation to health settings, we suggest that national guidelines be developed to ensure consistency for data collection across the country, and hence improve the quality of reporting. For example, the routine recording of age and sex, among other relevant population and individual variables, will support deeper insights into the true HBV situation, and lead to tangible improvements for patients and their communities. We also advocate significant investment in capacity building for improving HBV diagnosis, and sustained surveillance to monitor progress towards elimination. Also, Health workers and laboratory staff should take this research as an eye opener and respect the importance of protective measures.

Conclusion

In conclusion, our results show that the burden of HBV infection in Asokoro district hospital is high. Further

studies are required to better understand the extent to which genotype-specific epidemiological factors might influence the regional distribution of HBV prevalence in Nigeria. We recommend that more awareness should be made to the public about get vaccinated and that women of child bearing age should also screen potential patterns for Hepatitis B virus before making any form of sexually contact, medical staff should take protective measures very seriously as Hepatitis B virus is even 100 times more infectious than HIV.

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Disclosure of Conflict of Interest

The authors declare no conflicts of interest. The authors alone are responsible for the content and the writing of the paper.

Statement of ethical approval

Ethical approval was obtained from the ethics and research committee of Asokoro District Hospital, Abuja, Nigeria, and informed consent of the patients was obtained before sample collection.

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Availability of data and materials

The authors declare consent for all available data present in this study.

Authors' contribution

The entire study procedure was conducted with the involvement of all writers.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

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