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Mazen Abdelraouf Mohamed El Zahry
Department of Obstetrics and Gynecology, Faculty of Medicine for boys, Al-Azhar University, Cairo, Egypt

Ibrahim Ramdan Al Sawy Rady
Department of Obstetrics and Gynecology, Faculty of Medicine for boys, Al-Azhar University, Cairo, Egypt

Sabry Abdel Fattah Ibrahim Mohamed
Department of Hepatology, Gastroenterology and Infectious Diseases, Faculty of Medicine for boys, Al-Azhar University, Cairo, Egypt

Ezzat Kamal Kassem Abdelmageed
Department of Obstetrics and Gynecology, Faculty of Medicine for boys, Al-Azhar University, Cairo, Egypt, ezzatkamal86@gmail.com

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ORIGINAL ARTICLE

Prevalence of Hepatitis B in Pregnant Women and its Effect on Maternal and Fetal Outcome

Mazen Abdelraouf Mohamed El Zahry [a], Ibrahim Ramdan Al Sawy Rady [a], Sabry Abdel Fattah Ibrahim Mohamed [b], Ezzat Kamal Kassem Abdelmageed [a,*]

[a] Department of Obstetrics and Gynecology, Faculty of Medicine for Boys, Al-Azhar University, Cairo, Egypt
[b] Department of Hepatology, Gastroenterology and Infectious Diseases, Faculty of Medicine for Boys, Al-Azhar University, Cairo, Egypt

Abstract

Background: **The liver has been inflamed as a result of hepatitis, as shown by the presence of inflammatory cells in the tissue of the organ. Although there may be little or no symptoms, anorexia (poor appetite), jaundice, and general malaise are frequently the outcomes. Chronic hepatitis lasts longer than acute hepatitis, which is described as lasting shorter than six months.**

Aim and objectives: **To study the prevalence of hepatitis B in pregnant women and how it impacts both maternal and foetal outcomes at Al-Hussein university hospital.**

Subjects and methods: **This is a cross-sectional study that had been conducted on 1200 cases of pregnant women attending out clinics at Al-Hussein university hospital. 58 case were positive, 1142 were negative.**

Result: **Regarding preterm delivery, 3 of the patients have no infection, 5 have HBsAg positivity but no HBeAg positivity, and 3 have both. Regarding early preterm birth, 3 have HBsAg positivity but no HBeAg positivity, and 5 have both.**

Conclusion: **The findings underscore the disease burden of HBV in Egyptian women and corroborate earlier observations that pregnancy outcomes did not significantly correlate with HBsAg + regardless of HBeAg status.**

Keywords: Fetal outcome, Hepatitis B virus, Liver, Maternal outcome, Preterm labor

1. Introduction

Hepatitis causes the liver to become inflamed, which is demonstrated by the presence of inflammatory cells in the liver's tissue. Although there may be little or no symptoms, anorexia (poor appetite), jaundice, and general malaise are frequently the outcomes. Chronic hepatitis lasts longer than acute hepatitis, which is described as lasting shorter than six months.[1]

Hepatitis B is a potentially fatal liver infection brought on by the hepatitis B virus (HBV). Around 2 billion people, or one-third of the world's population, presently or formerly have HBV infection.[2]

A critical public health concern on a global scale is hepatitis B. With safe and efficient immunisations that have been accessible since 1982, it is avoidable. Over 350 million of the 2 billion persons who have contracted the hepatitis B virus (HBV) worldwide have chronic (lifelong) illnesses.[3]

Having viral hepatitis when pregnant increases the chance of problems for the mother.

Fetal and neonatal hepatitis, which can have major consequences for the neonate and result in compromised mental and physical health later in life, is caused by a high rate of vertical transmission. The most common cause of jaundice in pregnancy is also one of the main causes of maternal death. If the mother contracted acute hepatitis B during late pregnancy, the first postpartum, or if she is a chronic HBsAg carrier, the disease can be transmitted throughout pregnancy.[4]

The likelihood of perinatal transmission is increased by high maternal virus loads and maternal

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* Corresponding author at: Department of Obstetrics and Gynecology, Faculty of Medicine for boys, Al-Azhar University, Cairo, Egypt.
E-mail address: ezzatkamal86@gmail.com (E.K. Kassem Abdelmageed).

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serum hepatitis B e antigen (HBeAg) positive. When infants born to moms known to contain HBV were given hepatitis B immunoglobulin and the first dose of HBV vaccine within 12–24 h of birth, the risk of contracting HBV was reduced by 90%. Therefore, screening for HBsAg in pregnant women is necessary for the prevention of mother-to-child transmission.[5]

This research sought to determine the frequency of hepatitis B in pregnant women and how it affected both the mother and the foetus between January 1, 2021, and May 31, 2022.

2. Patients and methods

This was a cross-sectional study that had been conducted on 1200 cases of pregnant women attending out clinics at Al-Hussein university hospital from 1/12/2021 to 31/5/2022.

Ethical consideration: Ethical committee clearance had been taken. An informed oral and written consent had been taken from all the participants before the start of the study and after explanation of all steps of the study. Each participant has the right to leave at any time without any reason.

Inclusion criteria: All pregnant women whose pregnancy was confirmed by clinical history and examination or an obstetric ultrasound scan were included in study.

Exclusion criteria: Pregnant women whose were critically sick and unable answer the questionnaire during data collection were excluded from study.

2.1. Methods

All the participants had been subjected to the following: Complete history taking (age, parity, family history, and medical history), physical and obstetric examination, prenatal ultrasound evaluation, HBV infection testing on all participants, HBV infection testing on the children of participants with positive results to determine the rate of vertical transmission, and clinical examinations on all newborns at birth.

2.2. Technique

For HBV detection: Initial, a screening test was utilized to lay out regardless of whether the patient had hepatitis B surface antigen (HBs-Ag). Monoclonal antibodies with a high HBs-Ag reactivity were covered in the microstrip wells of business chemical connected immunosorbent examine (ELISA) units. At the point when the test was positive, it was surveyed regardless of whether other HBV blood markers were available. The ELISA packs were bought from Organon Teknika in Boxtel, the Netherlands, or Abbott Diagnostics in Abbott Park, Illinois.

Utilizing a third-age HBV-Stomach muscle ELISA unit, HBV was distinguished (OrthoHBV 4.0; Ortho-Clinical Diagnostics, Rochester, NY, USA). The Polymerase Chain Response was utilized to survey viral action to affirm the conclusion and preclude bogus positive discoveries (PCR). It had been put through PCR testing. Proteinase K was utilized to physically disintegrate cell films to recover the DNA. The pre-S1 through S area had been enhanced utilizing first-round PCR groundworks (external groundwork coordinates) and second-round PCR preliminaries because of the monitored idea of the nucleotide groupings around here (internal groundwork matches).

3. Results

This was a cross-sectional study that had been conducted on 1200 cases of pregnant women attending out clinics at Al-Hussein university hospital. 58 cases were positive, 1142 were negative.

Table 1 shows demographic data between studies groups. There was significant difference between both groups as regard BMI and Parity.

Table 2 shows the different symptoms of HBV in the positive group; the most of patients (57.8%) have no symptoms, the most found symptom was fatigue in (36.8%) of the patients while the least found symptom was loss of appetite (7.3%).

Table 3 shows that 55 of the patients have past history for surgery, 36 of them have past history for blood transfusion and 13 of them have past history for dialysis.

Figure 1 shows that there was no statistically significance difference between study groups.

Table 4 shows highly significant difference between study groups in the laboratory investigation such as AST, ALT, Total-Bilirubin, Direct Bilirubin, Serum albumin, INR, and PT.

Table 5 shows highly significant difference between study groups as regard white blood cells count, red blood cells count, and platelet count.

Table 1. Demographic data of studied cases.

	Positive ($n = 58$)	Negative ($n = 1142$)	P
Age			
Mean ± SD	26.25 ± 2.40	26.45 ± 2.20	0.44
BMI (kg/m2)			
Mean ± SD	26.54 ± 2.65	26.48 ± 2.22	0.02
Parity			
Mean ± SD	0.96 ± 0.21	0.97 ± 0.24	0.01

Table 2. Symptom of HBV (Positive = 58).

No symptom	34 (57.8%)
Fatigue	21 (36.8%)
Muscle aches	9 (15.7%)
Nausea	7 (12.6%)
Loss of appetite	4 (7.3%)
Fever	9 (16.8%)
swelling of lower limbs	10 (16.8%)
jaundice	7 (12.6%)

And there was not statistically significant difference as regard hemoglobin; it was 10.4 ± 1.44 in the negative group and was 13.5 ± 1.35 in the positive group.

Table 6 shows that as regard Preterm birth, 3 of the patients have No infection, 5 with HBsAg positive and HBeAg negative, 3 with HBsAg positive and HBeAg positive, as regard Early preterm birth, 3 with HBsAg positive and HBeAg negative, 5 with HBsAg positive and HBeAg positive.

4. Discussion

In Southeast Asia, hepatitis B virus (HBV) infection rates are comparatively high. Between 75 and 80 percent of the 240 million HBV carriers globally are expected to live in this region. In endemic areas of Southeast Asia and Africa, where mother-to-child (MTCT) or child-to-child transmission is the most significant route of transmission, up to 90% of infected individuals have a chronic course of the disease.[6]

Hepatitis B immunoglobulins (HBIG) should be regularly administered to mothers who are HBeAg positive (+) and at high risk of transmitting HBV after giving birth.

If a home birth occurs, the infant should be transported to a clinic where this specialised immunisation is provided before 72 h of life.[7]

However, because to the expense, production challenges, and requirement for a dependable cold chain, this preventative regimen is frequently underutilised in low-income countries (LIC). The high frequency of infectious diseases among pregnant women is a problem for the healthcare systems in LIC, and standard HBV testing is not always available. The current study's findings showed that the BMI and parity between the groups with positive and negative HBV were noticeably different. It is congruent with our findings because **Bierhoff** et al.,[8] who enrolled 11,025 women, showed a significant difference between the positive and negative HBV groups in regard to BMI and Parity. They discovered that the proportion of older women with negative HBV was substantially greater than the proportion of younger women with positive HBV, and they attributed this difference to the sizable age difference.

Table 3. Past history for surgery or blood transfusion, dialysis, family history for HBV.

Past history for surgery	55 (5.67%)
Past history for blood transfusion	36 (3.67%)
Dialysis	13 (1.26%)

However, the population-based study by **Liu** et al.,[9] which enrolled 489,965 women, in disagreement with our results, the study reported that there was no significant difference between positive and negative HBV groups as regard age and BMI, this may be due to the differences in sample size.

One more population-based study by **Bajema** et al.,[10] enrolled 26,801 pregnant women, and reported that there was significant difference between positive and negative HBV groups as regard age and BMI.

Also, in contrast to our results **Cui** et al.,[11] enrolled 21,004 cases and discovered that there was no significant difference between the positive and negative HBV groups with regard to parity and BMI, however that the mean age (SD) of the asymptomatic HBV carrier group was somewhat, but significantly, older than that of the control group (27.59 4,02 vs. 27,03 4.19 years, P 0.01). The disparity may result from the various inclusion criteria.

Additionally, **Zhao** et al.,[12] selected 33,437 pregnant ladies and uncovered that ladies in the positive HBV bunch were more seasoned than those in the benchmark group ($P < 0.001$). There was huge contrast between the concentrated on bunches as respect equality however, there was no massive distinction as respect BMI.

As regard symptoms of HBV in the positive assembling, the ongoing survey showed that most of patients (57.8%) make no side impacts; the most found aftereffect was shortcoming in (36.8%) of the patients while the most un-found secondary effect was loss of hankering (7.3%).

Continuous HBV infection in pregnant women is by and large asymptomatic but possibly be related to a fragile liver disease.[13]

The most frequently reported secondary consequence in patients with chronic viral hepatitis is depletion, which is associated with declines in prosperity-related personal fulfilment (HRQOL).[14] Overall, women were shown to have higher levels of fatigue than men.[15]

Hepatitis B is a viral infection that attacks the liver and can lead to serious and long-lasting sickness. The disease is spread through contact with a

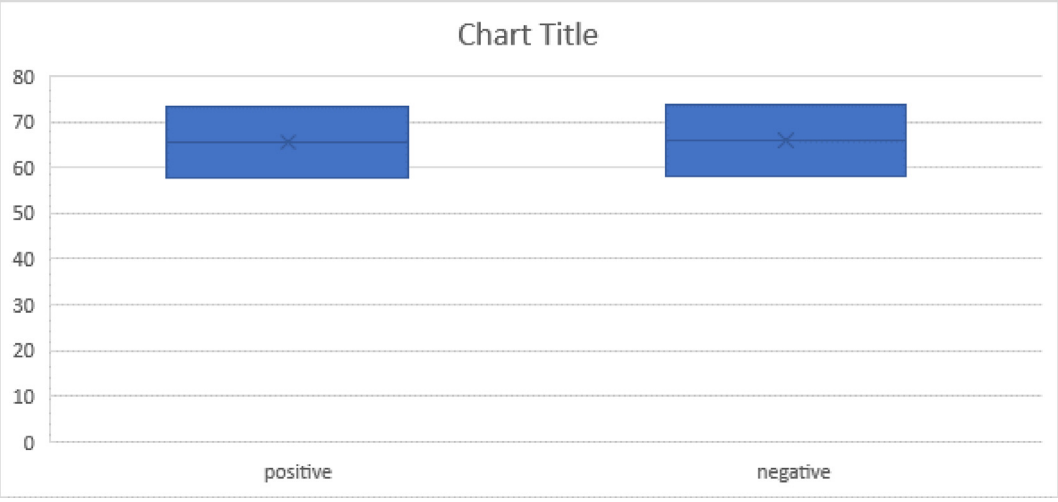

Fig. 1. DBP between study groups.

Table 4. Comparison between the studied groups as regard Laboratory investigations.

	Negative (n = 58)	Positive (n = 1142)	P
AST (U/L)	25.01 ± 2.6	35.30 ± 12.20	0.0001
ALT (U/L)	22.1 ± 2.15	29.87 ± 11.92	0.0001
Total-Bilirubin (mg/dl)	1.12 ± 0.40	1.21 ± 0.41	0.0001
Direct Bilirubin (mg/dl)	0.73 ± 0.12	0.91 ± 0.15	0.0001
Serum albumin (g/dl)	3.22 ± 0.13	3.47 ± 0.31	0.0001
INR	1.21 ± 0.2	1.4 ± 0.13	0.0001
PT(s)	12.71 ± 1.2	14.82 ± 2.51	0.0001

contaminated person's blood or other bodily fluids. Prior operative history and previous blood keeping history were combined as the factors that were totally taken into account to be connected with the acquisition of HBV.[13]

In an Egyptian study by **Mortada** et al.,[16] they listed the risk factors for contracting HBV infection as being family history of the disease, prior intravenous (IV) infusions, clinical focus cooperation, crisis facility attestation, and operations (P value = 0.001, 0.003, 0.002, 0.000, and 0.011, respectively). Another Egyptian study by **El-Karaksy** et al.[17] found that the frequency of immunisation encounters (OR = 5.65), the history of seeking medical advice in a clinic (OR = 7.02), the history of hospitalisation (OR = 6.82), the history of operations (OR = 4) and the family history of hepatitis (OR = 3.89) were all major risk factors for HBV positivity (P 0.05).

Also, **Kassaw** et al.,[18] definite that among the potential bet factors various sexual approach to acting (AOR 3.096), 95% CI = 1.469–6.525, P value = 0.003), shaving inclination (AOR 3.375, 95% CI = 1.511–7.538, P value = 0.003), a past loaded up with needle stick injury (AOR 4.080, 95% CI = 2.041–8.156, P value = 0.000), history of typical utilization of Sharpe materials (AOR 8.229, 95% CI = 3.991–16.967, P value = 0.000) and history of home transport by ordinary escorts were (AOR 1.557, 95% CI = 0.621–3.899, P value = 0.000) were essentially associated with huge marks of hepatitis B sickness. Correlation between the concentrated on bunches as respect Lab examinations, showed that there was exceptionally huge distinction between concentrate on bunches in the lab examination like AST, ALT, Direct bilirubin, total bilirubin, and According to the continuing research, Cui et al.11 found that HBV transporters also had significantly higher serum ALT levels than controls (24.75 7.22 vs.

Table 5. Comparison between the studied groups as regard CBC.

	Negative (n = 58)	Positive (n = 1142)	P
White blood cells 'WBCs' ($x10^3/ml^3$)	6.52 ± 1.23	6.22 ± 1.04	0.006
Red blood cells 'RBCs' ($x10^3/ml^3$)	4.02 ± 0.72	4.5 ± 0.50	0.006
Hemoglobin 'Hb' (g/dl)	10.4 ± 1.44	13.5 ± 1.35	0.105
Platelet ($x10^3/ml^3$)	181.9 ± 12.22	189.47 ± 19.82	0.0001

Table 6. Preterm birth and early preterm birth among babies of positive mothers.

Preterm birth	
No infection	3 (5.4%)
HBsAg positive and HBeAg negative	5 (8.8%)
HBsAg positive and HBeAg positive	3 (5.4%)
Early preterm birth	
No infection	2 (3.4%)
HBsAg positive and HBeAg negative	3 (5.8%)
HBsAg positive and HBeAg positive	5 (8.8%)

22.34 6.49 U/l, *P* 0.001) as well as serum egg whites, INR, and PT. When the CBCs of the studied groups were compared, it was discovered that there was a highly significant difference in the white blood cell count, red blood cell count, and platelet count between the study groups. Additionally, the difference in haemoglobin, which was 10.4 1.44 in the negative group and 13.5 1.35 in the positive group, was not statistically significant. **Wan** et al.,[19] are consistent with our findings in that there was no statistically significant change in haemoglobin levels. The current study revealed that in terms of preterm birth, 3 of the patients had no infection, 5 had HBsAg positivity but negative HBeAg, 3 had HBsAg positivity and positive HBeAg, and in terms of early preterm birth, 3 had HBsAg positivity but negative HBeAg, and 5 had HBsAg positivity and positive HBeAg. Furthermore, Pregnant women with HBsAg+/HBeAg + infection had a 21% higher risk of preterm birth than pregnant women who were not infected, according to **Ma** et al.,[20] research. **Bierhoff** et al.,[8] found no statistically significant difference in preterm birth rates between HBsAg+/HBeAg+ and HBsAg+/HBeAg- (26/419 (6.2%) vs. 8/188 (4.3%)0.8.

4.1. Conclusion

The findings underscore the illness burden of HBV in Egyptian women and confirm earlier findings that pregnancy outcomes do not significantly correlate with HBsAg + regardless of HBeAg status. To determine the significance of elements like disease activity, viral properties, and other clinical parameters of the illness, more research is required. It will take more population-based research with extended follow-up to corroborate our findings and find the risk factors for unfavourable outcomes.

Disclosure

The authors have no financial interest to declare in relation to the content of this article.

Authorship

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Conflict of interest

The authors declared that there were NO conflicts of Interest.

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