

Characteristics of Pregnant Women with Reactive HBsAg

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Abstract:

In developing countries, including Indonesia, vertical hepatitis B virus transmission still plays an essential role in spreading the hepatitis B virus. The first step in preventing vertical transmission is knowing the HBsAg status of pregnant women. The HBsAg screening method for pregnant women using a rapid test was carried out by the Hepatitis B Early Detection Activity (DDHB) for pregnant women at the Puskesmas and its network. In order to break the chain of hepatitis B transmission from mother to baby, health workers play an essential role in this, especially midwives. Because midwives are health workers closest to pregnant women, all pregnant women are expected to have their HBsAg status checked to know whether they have hepatitis B disease or not. This study aims to determine the relationship between the factors of pregnant women and the incidence of positive HBsAg where the characteristics include age, occupation, parity, environment, number of sex partners, history of blood transfusion, and history of hepatitis B immunization in the Taktakan district of Serang City, Banten. This study used an observational study with a case-control approach, and the case sampling technique was purposive sampling. The sample of this study was 80 pregnant women, with a total of 40 people from the case group and 40 people from the control group with a ratio of 1: 1. The research instrument consisted of a pregnant woman's early detection questionnaire at each pregnant woman's blood sampling. This questionnaire is in the Ministry of Health's program. In this study, it was found that there was a relationship between the characteristics of pregnant women based on the environment, the number of sex partners, and a history of hepatitis B immunization with the incidence of positive HBsAg in the Taktakan District, Serang City (Sig value > 0.05). As for the other variables in this study, there was no relationship between the characteristics of pregnant women based on age, occupation, parity, and history of blood transfusion with the incidence of positive HBsAg in the Taktakan District, Serang City (Sig value < 0.05). There is a relationship between the characteristics of pregnant women based on the environment, the number of sex partners, and a history of hepatitis B immunization with the incidence of positive HBsAg in the Kecamatan Taktakan, Serang City. Researchers hope that further research can continue with more diverse variables and samples.

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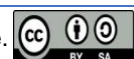
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INTRODUCTION

Hepatitis is liver inflammation caused by various causes such as bacteria, viruses, autoimmune processes, drugs, fats, alcohol, and other harmful substances. Bacteria, viruses, and parasites are the most common causes of infection, among the causes of these infections. Infection due to Hepatitis A, B, C, D, or E viruses is the highest cause compared to other causes, such as infectious mononucleosis, yellow fever, or cytomegalovirus. While the causes of non-viral

hepatitis are mainly caused by alcohol and drugs. The cause of this disease is the hepatitis B virus (HBV), which belongs to the Hepadnavirus family and is very small (42 nm) (Kemenkes RI, 2014a).

Hepatitis is a public health problem in developing countries, including Indonesia. Around 23 million Indonesians have been infected with Hepatitis B. According to the 2018 Riskesdas, the prevalence of hepatitis in Indonesia based on a doctor's diagnosis is 0.4% of Indonesia's population of 267.7 million people, an increase compared to the previous year, which was only 0.2%. Profile data from the Banten Provincial Health Office in 2019 stated that "out of 261,897 people in the population of pregnant women, 84,041 people had done Early Detection of Hepatitis B (DDHB) in pregnant women and obtained results that had reactive HBsAg status as many as 1,489 pregnant women (0, 6%)". Profile data from the Serang City Health Office in 2019 stated that "out of a total population of 14,334 pregnant women, 6624 pregnant women had done Early Detection of Hepatitis B (DDHB) and 127 pregnant women had reactive HBsAg status (1.92 %), there were 99 babies who received HBIG. Data on the number of pregnant women in the Takatakan District area (taken from 2 health centers in the Takakan District area, namely the Pancur Health Centre and the Takakan Health Centre) are 2025 people, 1389 pregnant women who have had DDHB done, and 40 pregnant women with reactive HBsAg status (2.88%).

In developing countries, including Indonesia, vertical transmission of the hepatitis B virus still plays an essential role in the spread of the hepatitis B virus. The first step to prevent vertical transmission is to know the HBsAg status of pregnant women. This prevention can be done by conducting HBsAg screening for every pregnant woman. The screening method for HBsAg in pregnant women uses a rapid test (Rapid Test) carried out by Early Detection of Hepatitis B (DDHB) in pregnant women in primary health services such as Public Health Centres and their Networks.

Break the chain of transmission of hepatitis B from mother to baby; health workers, especially midwives, play an essential role in this regard. Because midwives are health workers who are closest to pregnant women, it is expected that all pregnant women will be checked for their HBsAg status so that it is known whether pregnant women have hepatitis B disease or not. Babies born to mothers with HBsAg + status must get a 0.5 mL HBIG injection and hepatitis B vaccine. These injections are given immediately after the baby is born (less than 12 hours). If the baby has received the HBIG injection, there is a 95% chance that the mother will not infect it. Conversely, if the baby does not get HBIG, the baby will become a Hepatitis B carrier from the mother (Kemenkes RI, 2014b).

According to the Indonesian Ministry of Health and research by Pratono and Asri C. Adisasmita that "There are several factors related to hepatitis B transmission, including unsafe sexual relations, more than one sex partner, living at home with hepatitis B sufferers, from types of work with high risk, for example, medical personnel, commercial sex workers, even housewives. Sharing needles, blood transfusions contaminated with the hepatitis B virus, making tattoos, and using razors and nail clippers are also risk factors for hepatitis B transmission. There are also high-risk factors vertically, namely transmission from mothers with hepatitis B to their newborn children." Infections in neonates will cause chronicity in 90% of cases; in comparison, only 10% will experience chronicity for infections that occur as adults.

Hepatitis B virus can be found in sufferers' body fluids such as blood and blood products, saliva, cerebrospinal fluid, peritoneum, pleura, amnion, semen, vaginal fluid, and other body fluids. Still, not all of them have infectious virus levels. If it is not dealt with quickly, the baby will contract the virus from the mother. Therefore, it is necessary to take preventive measures, namely by early detection in pregnant women and injecting a passive vaccine named HBIG, when the baby is born.

The national program for preventing and controlling the hepatitis B virus is currently focused on preventing mother-to-child transmission (PPIA) because 95% of hepatitis B transmission is vertical, from HBsAg-positive pregnant women to their babies. Since 2015, early detection of hepatitis B (DDHB) activities has been carried out in pregnant women in the public health center and their networks. Examination of pregnant women with hepatitis B is carried out with blood tests using the HBsAg Rapid Diagnostic Test (RDT). HBsAg (Hepatitis B Surface Antigen) is a surface antigen found on the hepatitis B virus, which indicates Hepatitis B infection. Babies born to mothers who are detected with Hepatitis B (HBsAg reactive) are given a passive vaccine, namely HBIG (Hepatitis B immunoglobulin) before 12 hours of birth in addition to active national program immunization (Hb 0, Hb 1, Hb 2, Hb 3). HBIG is a Hepatitis B-specific antibody serum that provides immediate protection to the baby.

The incidence of hepatitis B in pregnant women is still a health problem that must be broken by knowing the HBsAg status of pregnant women and prevention by administering the HBIG vaccine to babies born to mothers with reactive HBsAg. From the Health Service and Health Centres profile data in the Taktakan Sub-District, pregnant women still have reactive HBsAg status. Hence, the researcher wants to examine more deeply the relationship of characteristics of pregnant women with the reactive HBsAg in the Takakan district region through the factors that support hepatitis B disease.

The problem in this study is the factors related to the incidence of reactive HBsAg in the Takakan District (Pancur Public Health Centre and Takakan Public Health Centre) Serang City, Banten Province. This research is very important considering the mechanism of Hepatitis B transmission can occur horizontally from one person to another who is not related by blood. Still, it can also be carried vertically from pregnant women to the fetus they contain. Likewise, research to study the risk factors for Hepatitis B in pregnant women is essential to prevent the incidence of Hepatitis B.

METHOD

This research is an observational study with a case-control approach, namely an epidemiological study design that studies the relationship between exposure (risk factors) and disease by comparing the case and control groups based on exposure status (Notoatmodjo, 2018). This research was conducted in September - December 2021. Conduct this research in the Takakan District area where the scope of this research is that there are two public health centers, namely the Pancur Public Health Centre and the Takakan Public Health Centre, Takakan District, Serang City, Banten Province, in 2021. The population in this study were all pregnant women in the Takakan District (Pancur and Takakan Public Health Centres) in 2021. 1 DDHB (Early Detection of Hepatitis B) was carried out by 1389 people and 40 people who were positive for HBsAg. The population of cases in this study were all pregnant women with reactive HBsAg status, namely 40 people. The sample number in this study was 80 people consisting of 40 people in the case group and 40 in the control group with a ratio of 1: 1.

RESULT

Relationship between Age with the Incidence of Positive HBsAg

The statistical test for the relationship between age and the incidence of positive HBsAg in Takakan District, Serang City, is shown in Table 1.

Table 1. Relationship between Age and Positive HBsAg

Age	HBsAg Events				Total		Value	Sig
	Positive		Negative					
	n	%	n	%	n	%		
<20	6	15	4	10	10	12.5	1.763	0.623
20-29	20	50	23	57.5	43	53.75		
30-29	14	35	12	30	26	32.5		
>40	0	0	1	2,5	1	1.25		
Total	40	100	40	100	80	100		

The statistical test results showed that the age variable obtained a Sig value of 0.623, which can be concluded that there is no significant relationship between age and the incidence of positive HBsAg.

Relationship between Occupational with the Incidence of Positive HBsAg

The statistical test for the relationship between occupation and the incidence of Reactive HBsAg in Takakan District, Serang City, is shown in Table 2.

Table 2. Relationship between Occupational and Positive HBsAg

Occupation	HBsAg Events				Total		Value	Sig
	Positive		Negative					
	n	%	n	%	n	%		
Working	19	47.5	16	40	35	43.75	0.475	0.499
Doesn't work	21	52.5	24	60	45	56.25		
Total	40	100	40	100	80	100		

The statistical test results show that the job variable has a Sig value of 0.499, which means that the Sig > 0.05 means no significant relationship exists between work and the incidence of positive HBsAg.

Relationship between Parity with the Incidence of Positive HBsAg

The statistical test for the relationship between parity and the incidence of Reactive HBsAg in Takakan District, Serang City, is shown in Table 3.

Table 3. Relationship between Occupational and Positive HBsAg

Parity	HBsAg Events				Total		Value	Sig
	Positive		Negative					
	n	%	n	%	n	%		
Never Given Birth	6	15	4	10	10	12.5	1.763	0.623
Have given birth 1x	20	50	23	57.5	43	53.75		
Childbirth > 1x	14	35	12	30	26	32.5		
Give birth > 5x	0	0	1	2,5	1	1.25		
Total	40	100	40	100	80	100		

The statistical test results show a Sig value of 0.623, which means that the Sig > 0.05 means no significant relationship between parity and the incidence of positive HBsAg.

Relationship between Environmental Risk with the Incidence of Positive HBsAg

The statistical test for the relationship between environmental risk and the incidence of Reactive HBsAg in Takakan District, Serang City, is shown in Table 4.

Table 4. Relationship between Environmental Risk and Positive HBsAg

Environmental Risk	HBsAg Events				Total		Value	Sig
	Positive		Negative					
	n	%	n	%	n	%		
At risk	9	22.5	0	0	9	11.25	10.141	0.001
No Risk	31	77.5	40	100	71	88.75		
Total	40	100	40	100	80	100		

The statistical test results show that the environmental Variable has a Sig value of 0.001, meaning that the Sig value < 0.05. So, there is a significant relationship between the environment and the incidence of positive HBsAg.

Relationship between the Number of Sex Partners with the Incidence of Positive HBsAg

The statistical test for the relationship between the number of sex partners and the incidence of Reactive HBsAg in Takakan District, Serang City, is shown in Table 5.

Table 5. Relationship between the Number of Sex Partners and Positive HBsAg

Sex Partner	HBsAg Events				Total		Value	Sig
	Positive		Negative					
	n	%	n	%	n	%		
1	31	77.5	40	100	71	88.75	10.141	0.001
>1	9	22.5	0	0	9	11.25		
Total	40	100	40	100	80	100		

The statistical test results showed that the variable number of sex partners obtained a Sig value of 0.001, which means that the Sig < 0.05. So, it can be concluded that there is a significant relationship between the number of sex partners and the incidence of positive HBsAg.

Relationship between Blood Transfusion History with the Incidence of Positive HBsAg

The statistical test for the relationship between blood transfusion history and the incidence of Reactive HBsAg in Takakan District, Serang City, is shown in Table 6.

Table 6. Relationship between the Blood Transfusion History and Positive HBsAg

Blood Transfusion History	HBsAg Events				Total		Value	Sig
	Positive		Negative					
	n	%	n	%	n	%		
Once	0	0	2	5	2	2.5	2051	0.152
Never	40	100	38	95	78	97.5		
Total	40	100	40	100	80	100		

Statistical tests showed that the blood transfusion history variable obtained a Sig value of 0.152, meaning the value of Sig > 0.05. So, in this study, there is no significant relationship between a blood transfusion history and positive HBsAg incidence.

Relationship between Hepatitis B Immunization History with the Incidence of Positive HBsAg

The statistical test for the relationship between hepatitis B immunization history and the incidence of Reactive HBsAg in Takakan District, Serang City, is shown in Table 7.

Table 7. Relationship between the Hepatitis B Immunization History and Positive HBsAg

Hepatitis B Immunization History	HBsAg Events				Total		Value	Sig
	Positive		Negative					
	n	%	n	%	n	%		
Once	13	32.5	32	80.0	45	56.25	18.34	0.000
Never	27	67.5	8	20.0	35	43.75		
Total	40	100	40	50	80	100		

The statistical test output showed that the hepatitis B immunization history variable obtained a Sig value of 0.000, which means that the Sig value < 0.05. So it can be concluded that there is a significant relationship between the history of hepatitis B immunization and the incidence of positive HBsAg.

DISCUSSION

Data on the number of pregnant women in the Takatakan District area (taken from 2 Public Health Centres in the Takakan District area, namely the Pancur Public Health Centre and the Takakan Public Health Centre) are 2025 people, and 1389 pregnant women who have been DDHB have been carried out, and pregnant women with HBsAg status reactive as many as 40 people (2.88 %). This study is in line with research conducted by Luuse et al. in Ghana, namely the prevalence of 2.4 %. This obtained figure was from 5 positive samples from 208 pregnant women examined (Luuse et al., 2016). This study also aligns with a survey conducted by Gunardi et al. in Jakarta in 2009. These data found that the prevalence was not much different by 2.2%, namely 22 pregnant women with positive HBsAg out of 1002 pregnant women tested for HBsAg (Gunardi et al., 2014). However, there are differences in the methods carried out by Gunardi with the examination method in this study, using the ELISA (Enzyme-Linked Immunosorbent Assay) method.

The results of this study indicated that there was no significant relationship between age ($p=0.623$), occupation ($p=0.499$), parity ($p=0.623$), and history of blood transfusion ($p=0.152$) with the incidence of HBsAg positive in pregnant women in the Takakan District, Serang City, Banten. However, three variables have a significant relationship with the incidence of positive HBsAg in pregnant women, namely environment ($p=0.001$), number of sex partners ($p=0.001$), and history of Hepatitis B immunization ($p=0.000$). This study's results align with Eke et al. (2011), which stated that age is not significantly related to the prevalence of positive HBsAg in pregnant women. This is also in line with the results of a study conducted by Anaedobe et al. which also found the highest prevalence of HBsAg-positive pregnant women in multiparas, namely 73.33%, while primiparas were 26.67%. According to him, the results of this study following the results of observations that pregnant women are said to be at the highest risk of HBV infection due to increased exposure to

risk factors such as blood transfusions, intravenous injection drugs, or surgical procedures (Anaedobe et al., 2015).

This research is not in line with research conducted by Magfira in 2016 at the same hospital as this study but in a different period. His research showed that the distribution of HBsAg-positive pregnant women based on the highest number of parities was in parity group 0, 24 out of 50 pregnant women examined. He said this might have happened because of HBV infection before pregnancy and even before marriage. So that in this case, it is necessary to carry out a complete examination when a woman is not pregnant to get treatment immediately so that the risk of transmission to her baby is also reduced (Magfira, 2016). The high prevalence of positive HBsAg in pregnant women with a history of parity ≥ 2 may be due to repeated pregnancies and deliveries that place pregnant women at greater risk of HBV infection due to screening procedures.

The results of this study are in line with the results of Partono's research (2015), that is, of the five variables found to have a significant relationship or as a risk factor for the occurrence of Hepatitis B in pregnant women in DKI Jakarta, the number of sex partners is the variable that has the strongest significant relationship after the history of transfusion with OR=21.47 (95%) CI=1.35–345.43), ie, Mother pregnant with >1 sex partner risky 21.4 times more likely to be infected with Hepatitis B compared to pregnant women who only have one sex partner.

The results of this finding are also in line with research conducted by Umare et al. (2016) in eastern Ethiopia and research by Cetin et al. (2018) in Antioch, Turkey (Cetin et al.). This study found a significant relationship between the number of sex partners and the incidence of hepatitis B infection in pregnant women, with adjusted OR values of 16.8 and 9.51, respectively. However, it is different from the research conducted in Uganda (Bayo et al., 2014); it was found that there was no relationship between the number of sex partners and the incidence of Hepatitis B in pregnant women. The same thing was also found by researchers from Ethiopia (Metaferia et al., 2016) that the incidence of Hepatitis B in pregnant women is not statistically related to the number of sex partners. Safe sex habits may influence differences in research findings between countries by using contraceptive condoms.

Pratono et al. (2015) found that the risk factors associated with the incidence of Hepatitis B in pregnant women in DKI Jakarta were a history of blood transfusions. One mode of transmission of Hepatitis B infection is through blood so a history of blood transfusion is one of the most significant risk factors for Hepatitis B infection in various studies.

The findings in this study are supported by findings in Shenzhen and Anhui Province, China (Guo et al., 2013; Li et al., 2012). Although the findings in Anhui Province are not specific for pregnant women, they are in the general population. On the other hand, several studies in several countries viz Kenya (Ngaira et al., 2016), Ethiopia (Metaferia et al., 2016), Palestine (Nazzal and Sobuh, 2014), Brazil (Souza et al., 2012), and Yemen (Cetin et al., 2018), found no significant relationship between a history of blood transfusions and the incidence of Hepatitis B infection in pregnant women. The differences in these findings could have been influenced by the systems and mechanisms of blood transfusions in these countries that are getting safer.

The variable living in the same house with Hepatitis B patients was also found to be one of the risk factors for the occurrence of Hepatitis B in pregnant women in Takakan District. This study found that pregnant women who lived live with a Hepatitis B patient was at risk 20.4 times greater to be infected with Hepatitis B with OR=20 (95% CI=9.35 – 45).

This study's results align with research conducted in Maranhao, Brazil (Souza et al., 2012) that living at home with Hepatitis B patients is a risk factor for Hepatitis B infection. However, the transmission mechanism of Hepatitis B infection is mostly through body fluids such as blood and sexual fluids. Transmission of Hepatitis B can also occur through sharing tools such as combs and

nail clippers. Living at home with a person who is positive for HBsAg can also mean that the person is a husband/wife who can transmit Hepatitis B through intercourse or a sibling who suffers from Hepatitis B through the transverse transmission of the virus from the biological mother.

The results of research by Nurhidayati et al. (2021) in Makassar show that a history of blood transfusions and living at home with hepatitis B sufferers are the most significant risk factors for the incidence of hepatitis B in pregnant women.

The limitations of this study were due to the incomplete medical record data used in this study. There were 10 incomplete medical records of pregnant women with positive HBsAg that had to be excluded. In addition, because this study uses secondary data, namely medical records, matters such as social, economic, and cultural background cannot be obtained because they are not included in the contents of the medical record. Besides that, the weakness of this study is the limited number of samples. The advantages of this study are that this research is fundamental to prevent the transmission of Hepatitis B transversely through the route of pregnant women to their babies.

CONCLUSION

There were three variables that had a significant relationship with the incidence of positive HBsAg, namely the household environment with hepatitis sufferers ($p=0.001$), number of sex partners ($p=0.001$) and history of Hepatitis B immunization ($p=0.000$). There was no significant relationship between age ($p=0.623$), occupation ($p=0.499$), parity ($p=0.623$) and history of blood transfusion ($p=0.152$) with the incidence of HBsAg positive in pregnant women in in the Takakan District, Serang City, Banten.

Suggestions for Public Health Centre to provide counseling or communication, information, and education about Hepatitis B, especially for pregnant women and can take various preventive measures by breaking the chain of transmission, namely carrying out Early Detection of Hepatitis B in pregnant women and carrying out HBI g immunization before 12 hours for babies with HBsAg reactive mothers.

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CONFLICT OF INTEREST

There is no conflict of interest for conducting this research.

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