



Analysis of the HBsAg status of toddlers born to HbsAg-reactive mothers at the Sikumana Community Health Center, Kupang City, in 2021

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ABSTRAK

Latar Belakang: Hepatitis merupakan penyakit menular yang menjadi masalah kesehatan masyarakat karena prevalensinya masih tinggi. Hepatitis adalah peradangan hati yang bisa berkembang menjadi fibrosis, sirosis atau kanker hati. Data Basic health research tahun 2017 menunjukkan presentase ibu hamil HBsAg reaktif tertinggi kedua di Indonesia yaitu Nusa Tenggara Timur (5,26%).

Tujuan: Penelitian ini bertujuan menganalisis status HBsAg batita yang lahir dari ibu hamil HBsAg reaktif di Puskesmas Sikumana Kota Kupang tahun 2021.

Metode: Penelitian ini bersifat analitik dengan pendekatan kuantitatif dan menggunakan desain penelitian cross sectional. Penelitian ini dilakukan di Puskesmas Sikumana pada bulan September-Oktober 2021 dengan jumlah sampel 53 orang batita yang lahir dari ibu hamil reaktif HBsAg pada tahun 2019. Data yang digunakan data primer dengan instrumen berupa kuesioner dan pengambilan sampel darah untuk dilakukan pemeriksaan HbsAg oleh petugas laboratorium Puskesmas Sikumana. Teknik analisa data menggunakan analisa univariate dan bivariate (chi square) dengan aplikasi spss versi 20.

Hasil: Hasil penelitian menunjukkan ibu hamil yang reaktif HBsAg di Puskesmas Sikumana Kota Kupang berjumlah 53 orang dimana sebagian besar ibu memiliki pengetahuan baik tentang Hepatitis B (83.0%). Hasil pemeriksaan konfirmasi tes RDT HBsAg pada bayi yang lahir dari ibu hamil reaktif HBsAg diketahui 4 orang batita (7,5 %) reaktif HbsAg yang artinya masih terdapat kegagalan dalam imunoglobulin (HBIg). Hasil uji chi square terdapat hubungan antara pengetahuan ibu, umur anak, dan riwayat pemberian HBIg dengan status HBsAg batita.

Kesimpulan: Petugas kesehatan diharapkan meningkatkan penyuluhan dan sosialisasi tentang Hepatitis B dan pentingnya pemeriksaan ulang bayi yang telah mendapatkan imunoprolifaksis HBIg mengingat program pemeriksaan konfirmasi tes RDT HBsAg belum berjalan baik dan masih terdapat kegagalan imunoglobulin (HBIg) walaupun kecil. Pemeriksaan ulang ini penting untuk mendeteksi efektivitas HBIg sehingga jika terdapat kegagalan HBIg maka dapat diberikan penanganan secara dini.

KATA KUNCI : HBsAg; HBIg; batita

ABSTRACT

Background: Hepatitis is an infectious disease which is regarded as a public health problem due to its high prevalence. It is an inflammation of the liver that may develop into fibrosis, cirrhosis or liver cancer. The data obtained from the basic health research in 2017 shows that East Nusa Tenggara has the second highest percentage of HBsAg reactive-amongpregnant women in Indonesia (5.26%).

Objectives: This study aims to analyze the HBsAg status of toddlers born from pregnant women with HbsAg-reactive at the Sikumana Health Center, Kupang City, in 2021.

Methods: This is an analytical research carried out with a quantitative approach carried out and a cross sectional research design. This research was conducted at the Sikumana

Community Health Center in September-October 2021 with a total sample of 53 toddlers born to HBsAg-reactive pregnant women in 2019. The data used were primary data collected using instruments in the form of questionnaires and blood samples taken for the HBsAg examination which was carried out by laboratory workers at the Sikumana Community Health Center. Meanwhile, the data analysis was performed using univariate and bivariate (chi square) method with version 20 of SPSS application.

Results: *The results show that there were 53 HbsAg-reactive pregnant women at the Sikumana Community Health Center, Kupang City, and most of whom (83.0%) had good knowledge about Hepatitis B. The HBsAg RDT test in infants born to pregnant women with HbsAg-reactive revealed that there were 4 toddlers (7.5%) with HBsAg reactive, indicating that there was still a failure in immunoglobulin (HBIG). Furthermore, the results of the chi square test showed that there was a relationship between mother's knowledge, child's age, and history of HBIG administration with toddler's HBsAg status.*

Conclusions: *Health workers are expected to increase education and socialization about Hepatitis B and the importance of re-examination of infants who have received HBIG immunoprophylaxis. The re-examination is necessary considering that the confirmation examination program for the HBsAg RDT test has not been going well and immunoglobulin (HBIG) failures still occurred even if only in small number. Furthermore, this re-examination plays pivotal role to detect the effectiveness of HBIG so that early treatment can be given if there is a HBIG failure.*

KEYWORD : HBsAg; HBIG; toddler

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INTRODUCTION

Hepatitis is a type of liver inflammation that may lead to scar tissue (fibrosis), cirrhosis and even liver cancer. It is caused by various factors such as viral infections, toxic substances like alcohol, certain drugs, and autoimmune diseases. The highest percentage of Hepatitis B transmission in the world is found in sub-Saharan Africa and East Asia, with 5-10% of the adult population is chronically infected. In the Middle East and the Indian subcontinent, it is estimated that 2-5% of the general population is chronically infected. Likewise, less than 1% of the population in Western Europe and North America is chronically infected with Hepatitis B (1).

Viral hepatitis is currently included as one of the Sustainable Development Goals (SDG's) indicators with a target of 3.3% towards a healthy Indonesia by 2030 (WHO, 2017). In Indonesia,

the prevalence of hepatitis in 2013 reached 1.2%, which was doubled compared to the data obtained from the basic health research in 2007 (0.6%). The prevalence of hepatitis B in East Nusa Tenggara was 4.3%, making this province as a place with the highest prevalence of hepatitis in 2013. Meanwhile, based on the data obtained from the basic health research in 2017, NTT was placed as the second highest with 5.26% of pregnant women with HBsAG (2).

Hepatitis B can be transmitted in two ways, vertically and horizontally. Vertical transmission may occur during pregnancy, during birth, and after birth. Meanwhile, horizontal transmission may happen through blood, contaminated needles, saliva, vaginal secretions and semen(3). Vertical transmission, transmission from mother to newborn child, is more common in the perinatal period.

Transmission of HBV through a carrier mother to her baby can occur throughout the perinatal period and is an important factor in determining the prevalence of hepatitis virus infection, especially in areas of high endemicity such as China and Southeast Asia. If a pregnant woman who is carrier of Hepatitis B and HBeAg is positive, then the baby that will be born is 90% likely to be infected and become a carrier of the virus as well, even 25% of whom are likely to die from chronic hepatitis or liver cancer.(4)

Hepatitis B virus infection generally occurs in countries where vaccination of Hepatitis B in pregnant women and HBIG in infants are lacking or difficult to obtain. Based on data from the CDC, there were 40% of newborns infected with HBV in United States because they did not receive immunoprophylaxis, and 1 out of 4 eventually die from chronic liver disease. (10). Pregnant women with Hepatitis B has the risk to experience rupture of esophageal varices which may lead to bleeding (20-25 %), particularly in the second trimester, jaundice, and ruptured of splenic aneurysm (5).

Cirrhotic patients are at risk of perinatal HBV decompensation. Based on a retrospective study conducted on 400 mothers with HBV cirrhosis, there was 15% of severe attacks during pregnancy, 1.8% of maternal deaths, and 5.2% of fetal deaths (Come on WS 2016). Given the poor long-term prognosis, pregnant women with chronic hepatitis B are advised to undergo liver transplantation, abortion, and sterilization (Cunningham GF et al., 2014).

The National Program for the prevention and control of the hepatitis B virus currently focuses on preventing mother-to-child transmission (PPIA). This is because 95% of hepatitis B transmission is vertical or transmitted from carrier mothers to their babies. Hepatitis B screening activity (DDHB) in pregnant women has been carried out since 2015 in community health centers (Puskesmas) and their networks

(Ministry of Health RI, 2017).

To detect hepatitis B, pregnant women need to be examined in a laboratory by taking their blood sample to be used for the HBsAg Rapid Diagnostic Test (RDT). Hepatitis B Surface Antigen (HBsAg) is a type of surface antigen that can be found in hepatitis B virus, which is a marker of someone being infected with hepatitis B. HBIG is given to infants born to mothers with HBsAg-reactive status within 24 hours. In addition, active immunization is also given according to the national program, such as HB0, HB1, HB2 and HB3. Hepatitis B immunoglobulin (HBIG) is a specific hepatitis B antibody serum that functions to provide protection through passive immune formation to infants (Ministry of Health RI, 2017).

The provision of HBIG immunization to infants is conducted based on the results of the mother's HBsAg examination during pregnancy or delivery. Infants born to mothers with HBSAg-positive are given 0.5 mL of HBIG and 5 mcg (0.5 mL) of recombinant vaccine of the lower extremity 12 hours after birth. For infants born weighing less than 2000g, the first dose of vaccine is not considered part of the vaccine package because of the low immunogenicity potential of hepatitis B, resulting in 4 doses of vaccine in total. After the vaccination is completed, the anti-HBs and HBsAg are tested at the age of 9-12 months to assess the anti-HBs concentration. Screening should not be done before 9 months to prevent passive detection of anti-HBs from HBIG given at birth and to maximize detection of HBV infection (Gozali, Angelin Putri , 2020).

The data obtained from the Sikumana Community Health Center in 2019 showed that of 1510 pregnant women who had their pregnancies checked, 53 had HBSAG-reactive and examination on children (after aged older than 9 months) born to HBSAG-reactive pregnant women had never been done. Therefore, we are interested to further analyze the HBsAg status

of children under the age of three (toddlers) born to HBsAg-reactive pregnant women at the Sikumana Community Health Center, Kupang City, in 2021 to figure out the effectiveness of immunoglobulin (HBIG).

MATERIALS AND METHODS

This is an analytical research carried out with a quantitative approach and a cross sectional research design. This research was conducted at the Sikumana Community Health Center in September-October 2021. The population in this study were all children under the age of three (toddlers) born from 53 HbsAg-reactive pregnant mother at the Sikumana Community Health Center, Kupang, in 2019. The sampling technique utilized was total sampling where the entire population was taken as samples. The data used was primary data with research instruments in the form of questionnaires and the blood samples taken for the HBsAg examination performed by the laboratory workers of the Sikumana Community Health Center. Univariate and bivariate (chi square) analysis with version 20 of SPSS were employed as the data analysis technique. Meanwhile, the data were presented in narrative and tabular form (9).

RESULTS AND DISCUSSION

RESULTS

Table 1. Distribution of the characteristics of respondents' mother at the Sikumana Community Health Center, Kupang City, in 2021

VARIABLE	F	%
Mother's Age		
< 20 Years, > 35 Years	7	13.2
20- 35 Years	46	86.8
Total	53	100
Mother's Education		
Low (Under 9 years education)	12	22.6
High (More than 9 years education)	41	77.4
Total	53	100
Mother's Knowledge about Hepatitis B		
Insufficient	9	17.0
Well	44	83.0
Total	53	100

Table 2. Distribution of characteristics of toddlers born to pregnant mothers with HBsAg-reactive at the Sikumana Community Health Center, Kupang City, in 2021

VARIABLE	F	%
Child's Age		
13-24 months	13	24.5
9-12 months	40	75.5
Total	53	100
Child's Gender		
Male	40	75.5
Female	13	24.5
Total	53	100
History of HBIG		
>12 hours after birth	4	7.5
<12 hours after birth	49	92.5
Total	53	100
HBIG Status		
reactive	4	7.5
Non-reactive	49	92.5
Total	53	100

Based on the results of the study, there were 53 pregnant women with HbsAg-reactive at the Sikumana Community Health Center, Kupang City. As can be seen in Table 1, most pregnant women (46 people/86.8%) were at the ideal reproductive age of 20 to 35 years, possessed a high level of education (41 people/77.4%) and most of whom had good knowledge about Hepatitis B (44 people/ 83.0%).

Meanwhile, of 53 toddlers born to pregnant women with HBsAg-reactive in 2019 at the Sikumana Community Health Center, Kupang City, the majority were male (40 toddlers/75.5%), all of whom had received HBIG immunoprophylaxis, and most of whom (49 toddlers/92.5%) had HBIG < 12 hours after birth, as shown in Table 2. The HBsAg re-examination in toddlers were mostly carried out at the age of 9-12 months (40 toddlers/75.5%) and the re-examination results showed that there has been transmission of hepatitis B infection in 4 infants (7.5 %) born to HbsAg-reactive pregnant women consisting of 3 males and 1 female.

Referring to Table 3, the results of the chi square analysis where the age of toddlers (p value 0.042 < 0.05). The history of HBIG

Table 3. Results of bivariate analysis

Variable	HBsAg Status				Total		P Value
	Reactive		Non-Reactive				
	N	%	N	%	N	%	
Mother's Knowledge							
Insufficient	4	44.4	5	55.6	9	100.0	0.000
Well	0	0.0	44	100.0	44	100.0	
Total	4	7.5	49	92.5	53	100.0	
Child's Age							
9-12 months	1	2.5	39	97.5	40	100.0	0.042
13-24 months	3	23.1	10	76.9	13	100.0	
Total	4	7.5	49	92.5	53	100.0	
Child's Gender							
Male	2	5.0	38	95.0	40	100.0	0.249
Female	2	15.4	11	84.6	13	100.0	
Total	4	7.5	49	92.5	53	100.0	
History of HBIG							
>12 hours after birth	4	100.0	0	0	4	100.0	0.000
<12 hours after birth	0	0	49	100.0	49	100.0	
Total	4	7.5	49	92.5	53	100.0	

administration have a significant relationship with the HBsAg status of toddlers born to HbsAg-reactive pregnant women (p value $0.000 < 0.05$). Meanwhile, there is no relationship between the sex of toddlers and the HBsAg status of toddlers born from HbsAg-reactive pregnant women in 2021 at the Sikumana Community Health Center, Kupang City (p value $0.249 < 0.05$, OR 3.455; 0.435-27.422).

Table 3 also shows further analysis of this study where the mother's knowledge has a significant relationship with the HBsAg status of toddlers with a p value of $0.000 < 0.05$. This is in line with the research conducted on knowledge and behavior of pregnant women at the Kasui Public Health Center, Way Kanan Regency, which showed that most respondents had a sufficient level of knowledge about hepatitis B (19 people/54.3%) and had undergone for HBsAg test (19 people/54.3%) (1)

DISCUSSION

Hepatitis B virus (HBV) is a type of DNA virus belonging to the Hepadnaviridae family. Hepatitis B virus can affect all ages, genders, and races around the world. This virus can cause

acute or chronic liver inflammation which can lead to cirrhosis of the liver or liver cancer if not treated properly (8). HBV can be transmitted through contact with HBV-infected blood. One of the transmissions is acquired from mothers positive for Hepatitis B to their babies. In Indonesia, this type of transmission become the largest occurrence (95%) (2).

Babies born to hepatitis B carrier mothers will be given a passive vaccine, namely the HBIG (Hepatitis B Immunoglobulin) vaccine. According to the national program, it should be given within 24 hours of birth in addition to the HB0 immunization. HBIG is a specific hepatitis B antibody serum given to infants so that they can obtain direct protection from the HBV. The efficacy of administering HB0 vaccine alone is 75%, while the efficacy of giving HB0 and HBIG vaccines in newborns is 94%. Both immunizations, when given at the right time, can provide a fairly high level of protection (10).

HBV can be detected in pregnant women through the HBsAg (Hepatitis B Surface Antigen) examination during pregnancy. HBV infection in pregnant women can cause fulminant hepatitis and increase maternal and infant mortality. This

is in accordance with the research finding from Susanty et al., (2017) which revealed that of 133 pregnant women who conducted a pregnancy check during January-March, there had never been an early detection of hepatitis B. After hepatitis B detection in pregnant women at the Abeli Health Center in Kendari City was carried out, 1 out of 25 samples (4%) was tested positive and 24 (96%) were negative (11).

Hepatitis is actually preventable. According to the results of the study, transmission to babies occurs while still in the womb, during childbirth, and after delivery. Hepatitis B can be prevented during the first pregnancy through screening activities. To reduce the transmission rate of hepatitis B transmission, it is recommended that pregnant women positive for hepatitis B give birth by elective caesarean section method (12).

The results of this study are in line with other studies where the prevalence of HBV infection in pregnant women was 2.57%. The factors that had a significant relationship with the incidence of HBV infection were age, parity, LILA, anemia and living place. Of those factors mentioned, age was dominant with p value 0.000 and OR 1.608. The results of this study concluded that pregnant women aged 16-40 have a risk of being infected with HBV due to sexual activity and pregnancy, as well as childbirth which can be an entry point of HBV for mothers (13).

Another study was conducted at the Beringin Health Center, Lubai District, Palembang City. The results of the chi square test with the SPSS version 16.0 program showed that the level of knowledge had a significant relationship with the incidence of hepatitis B with a p value of 0.021 (14). Similarly, a research conducted at Pratama Sehati Husada Clinic, Deli Tua Medan, revealed that based on age, most respondents (31 people/42.5%) had sufficient knowledge of hepatitis B with a vulnerable age of 22-26 years. In addition, based on the level of education, most respondents (28 people/38.4%) had sufficient

knowledge with a high school education level (15).

The results of the binary logistic statistical test showed that knowledge had a significant relationship with hepatitis examination in the Martoba Community Health Center with p value of $0.021 < 0.05$ and $\text{Exp (B)} = 9.032$, indicating that respondents with good knowledge had 9,032 times greater chance to undergo hepatitis examination compared to those with less knowledge (16).

The results of community service in Kediri District, Tabanan Regency, in 2018 conducted by Dhyana Putri et al (2019) found out that of all pregnant women who participated in community service, 32% were between 26-30 years with gestational age was mostly 7 months (21%) and the highest number of gravida was the 2nd gravida (47%). After counseling, there was an increase in the knowledge of pregnant women about Hepatitis B under the good category (92%). In addition, the HBV screening carried out through a rapid test found that 6% of pregnant women had been infected with HBV. The interest of pregnant women to participate in self-examination was high after receiving counseling (17).

Table 2 also shows the results of the chi square analysis where toddlers' age (p value $0.042 < 0.05$) and the history of HBIG administration (p value $0.000 < 0.05$) had a significant relationship with the HBsAg status of toddlers born to pregnant women with HbsAg-reactive at Sikumana Community Health Center, Kupang City, in 2021. This result is in line with that of another study which showed that the results of the HBsAg examination in infants aged 9-12 months born to HBsAg reactive mothers immunized with HBIG at the community health center in Suradadi District, Tegal Regency revealed that 10 babies (100%) were HbsAg-non-reactive even though they were born to HbsAg-reactive mothers. This means that there

is no vertical transmission in infants after being given HBIG immunization 12 hours after being born, even though they were born to an HbsAg-reactive mother. Therefore, this study concluded that giving HBIG to infants born to HbsAg-reactive mothers is very effective (4).

Similarly, Ahmad & Kusnanto (2017) stated that the administration of HBIG < 12 hours after birth provides high effectiveness to reduce the risk of HBV transmission from mother to her baby. The incidence of HBV infection in infants aged > 9 months born to HbsAg-reactive mothers in Magelang Regency in 2014-2016 showed that there was no transmission (0%) with the percentage of HB0 vaccine administration history <12 hours to 100% respondents and a history of giving HBIG <12 hours 68.85%.(10)

According to WHO recommendations, HBIG and Hepatitis B vaccine should be given 24 hours after delivery by IM at a dose of 0.5 ml in order to get higher effectiveness (Hariyono, S. & Hadinegoro, 2014). Based on the national guidelines in Indonesia, every pregnant woman is required to undergo hepatitis B screening. For babies born to HbsAg-reactive pregnant women, it is necessary to give HBIG immunoprophylaxis <12 hours after birth in addition to the Hepatitis B vaccine. Then, confirmation to the HBsAg RDT test need to be carried out at the age of 9-12 months. If the result is reactive, the baby should be referred to a pediatrician for further examination and therapy (18).

Hepatitis B vaccine should be given immediately after birth, considering that Hepatitis B vaccination is an effective prevention effort to break the chain of transmission through maternal transmission from mother to her baby. There are two types of hepatitis B vaccine containing HBsAg, namely plasma-derived and recombinant vaccines. Both vaccines are safe and immunogenic even if given at birth because anti-HBsAg antibodies do not interfere with the response to the vaccine (19).

HBV transmission can also occur during delivery in pregnant women with high HBV titers (3.5 pg/mL) or positive HBeAg. Pregnant women with HBeAg positive are better off giving birth by caesarean section (SC) at delivery of more than 14 hours. If a vaginal delivery is performed, minimizing the trauma caused by childbirth and joint treatment with an Internal Medicine Specialist should be carried out so that acute infection due to HBV can also be reduced (20).

Zone et al., (2020), through their research, stated that the prevalence of Hepatitis B antigen in pregnant women was 7.3% (49 people), where the increasing new cases of HBV were statistically caused by the number of sexual partners (AOR = 2.675, 95% CI = 1,107–6463), surgical procedures (AOR = 3,218, 95% CI = 1,446–7,163), genital mutilation (AOR = 2.72, 95% CI = 1,407–5,263), and tooth extraction (AOR = 2,049, 95%CI = 1,061–3,956) (21).

Khumaedi et al. (2016) also added that the incidence of perinatal transmission reached 70-90% in HBsAg positive and HBeAg positive mothers without immunoprophylaxis (22). Cheung KW and Seto MT (2013) explained that perinatal transmission can occur through the process of delivery, that is during microtransfusion or contact between the mother's blood and the baby's mucosa during contractions. In addition, chorioamnionitis, the threat of preterm delivery, and the use of birthing aids can increase the risk of HBV transmission. It is estimated that 5-15% of all pregnancies with hepatitis B can occur via transplacental transmission. Hepatitis B e antigen (HBeAg) is the only type of hepatitis B virus structure that can cross the placental blood barrier because of its small molecular weight (23).

Prevention of vertical transmission is one of the most important aspects in breaking the chain of HBV transmission. One strategy to prevent vertical transmission of HBV from mother to baby is to conduct Hepatitis B

screening in the first trimester of pregnancy and administer immunoprophylaxis using hepatitis B immunoglobulin (HBIG) in infants born to HbsAg-reactive pregnant women. Hepatitis B vaccination for the body's immunity is also needed to prevent the HBV virus from entering the body which may lead to liver cells damage.

Vaccination history has an influence on the incidence of hepatitis B. These results indicate that the vaccine has great influence in preventing hepatitis B so that it is necessary to increase the vaccination program to control the incidence of hepatitis B. (24)

Lestari (2015) added that Hepatitis B and E viruses are viral hepatitis infections that can be transmitted from mother to fetus, and VHE is a cause of mortality and morbidity that occurs in fetuses to mothers with hepatitis. (25) In developed countries, hepatitis B transmission occurs mostly horizontally, while in developing countries 90% of hepatitis B transmission occurs through vertical transmission. Efforts to prevent vertical transmission have also been carried out through the administration of Hepatitis B immunoglobulin which has a success rate of 95%. However, small proportion of the population still experience immunoprophylaxis failure and at risk of developing chronic hepatitis B. Antenatal administration of antivirals plays a role in preventing vertical transmission in populations at risk for immunoprophylaxis failure. Several antivirals that can be used in this prevention effort include lamivudine, telbivudine, and tenofovir (22).

This result is in accordance to that of Benny Harmoko who stated that there was no relationship between gender and the HBsAg status of toddlers ($p>0.05$). However, male toddler (54.8%) had greater probability than female (45.2%)(26). Wheeley et al., (1989) cited by (Surya et al., 2016) added that vertical transmission is less likely to occur in female than male infants. Meanwhile, data center and

information on the situation and analysis of hepatitis B in Indonesia (2014) showed that Hepatitis B is more commonly occur in male than female, but there is no clear factor as to why male are more susceptible than female (27).

Thus, maternal knowledge becomes one of the factors that influence the behavior and decisions of mothers to carry out early detection of HBV during pregnancy. It is hoped that sufficient knowledge about HBV can increase maternal awareness to carry out HBV examination so that transmission of HBV from mother to baby can be prevented. For mothers with HbsAg-reactive, in addition to hepatitis B vaccine, 0.5 ml of hepatitis immunoglobulin (HBIG) is also given on different sides of the body within 12 hours after birth. Despite the effectiveness of HBIG, a small part of the population still experience failure. Thus, the HBsAg re-examination needs attention considering that the program for confirming the RDT HBsAg test in infants born to HbsAg-reactive pregnant women has not gone well.

One of the factors causing the failure of HBIG is the delay of HBIG treatment for more than 12 hours, resulting in the reduction of vaccination effectiveness. Other factors which have not been studied, such as incomplete hepatitis B immunization status, can also cause a toddler's HBsAg status to be reactive. Therefore, sufficient knowledge about HBV will increase the mother's interest in HBsAg examination so that even if new cases occur, the cure rate will also increase.

CONCLUSION AND RECOMMENDATION

Based on the results of the research above, it can be concluded that of the 53 pregnant women with HbsAg-reactive at the Kupang City Community Health Center in 2019, most of the mothers had good knowledge of HBV (44 people/83.0%). The results of the HBsAg re-examination in toddlers showed that 4 toddlers (7.5%) were HbsAg-reactive. This indicates that there is still a failure of immunoprophylaxis

which occur as a result of the delayed HBIG treatment for more than 12 hours, resulting in the reduction in vaccination effectiveness. This study also has not discussed the most influential factors on the HBsAg status of toddlers such as complete hepatitis B immunization status, history of childbirth, breastfeeding history, and others. Thus, further research addressing these issues can be developed.

Therefore, health workers are expected to increase public awareness by continuing to promote early detection as a way to prevent HBV transmission, especially for pregnant women to prevent vertical transmission during pregnancy. In addition, it is necessary to provide counseling and socialization about the importance of re-examination for infants who have received HBIG immunoprophylaxis, considering that the confirmation examination program for the HBsAg RDT test in infants born to HbsAg-reactive pregnant women has not been running well. Meanwhile, even if only in small number, there is still a possibility of HBIG immunoprophylaxis failure. With this re-examination, infants with failure of HBIG immunoprophylaxis can be treated earlier and chronic diseases caused by HBV can also be prevented.

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