

Salmonella sp. Antibody detection in expectant with an early diagnosis of *Hyperemesis gravidarum* using slide widal test

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ABSTRACT

Typhoid fever is a global problem especially in countries with poor hygiene. The main etiologies in Indonesia are *S. Typhi*, *S. enterica*, *Serovar enterica*, and *S. Paratyphi A*. Pregnant women are very sensitive to infection from various microorganisms, physiologically the immune system in pregnant women decreases, possibly as a result of the tolerance of the mother's immune system to the baby, which is a semi-allogenic tissue. The aim of this research was to detect antibodies to *Salmonella* sp. in pregnant women with an early diagnosis of *Hyperemesis gravidarum* using the slide method widal test. Based on the results of research on salmonella sp antibody detection in pregnant women with an early diagnosis of hyperemesis gravidarum using the slide method widal test, there were 80% of salmonella sp. in pregnant women with an early diagnosis of hyperemesis gravidarum. 16 positive samples from 20 total samples, 20% of samples are positive for O series antigens, 40% of samples are positive for O and H series antigens, and 20% of samples are positive for H series antigens.

I. Introduction

Abdominal typhoid or typhoid fever or enteric fever are acute systemic illnesses. Typhoid fever is a global problem especially in countries with poor hygiene. The main etiologies in Indonesia are *Salmonella enterica*, subspecies *serovar Typhi* (*S. Typhi*) and *Salmonella enterica*, *Serovar enterica*, *Paratyphi A* (*S. Paratyphi A*)¹.

Typhoid disease in South Sulawesi Province in 2006, there were 16,909 typhoid fever sufferers with 11 deaths (CFR = 0.07%) and the highest distribution of typhoid fever was in Gowa, Enrekang, Makassar and Parepare in South Sulawesi province².

Pregnant women are very sensitive to infection from various microorganisms, physiologically the immune system in pregnant women decreases, possibly as a result of the tolerance of the mother's immune system to the baby, which is a semi-allogenic tissue. Acute infections can have complications depending on the clinical condition and the quality of care available³.

Abdominal typhus in pregnancy, and the puerperium shows a higher mortality rate than outside pregnancy. Pregnant women who have typhus have a 15 percent risk of death or more. This disease has a negative impact on pregnancy. The fetus is about 60-80 percent likely to die or be born prematurely, the earlier the infection occurs in pregnancy, the more likely it is to end the pregnancy⁴.

Based on the experiences of some colleagues and the experiences of patients, they know if they are infected with *Salmonella* sp. After a few months after the complaint appeared, they experienced more severe symptoms and complaints for longer than the symptoms of hyperemesis gravidarum in general and they got better after receiving therapy for *Salmonella* sp infection.



There are several clinical signs that are similar between *Salmonella* sp. Infection. and hyperemesis gravidarum which resulted in *Salmonella* sp. it is often not detected immediately and clinical management focuses only on the treatment of hyperemesis gravidarum. While *Salmonella* sp. which is not detected immediately can make matters worse.

Based on these reasons, the authors want to conduct research to detect antibodies against *Salmonella* sp. in pregnant women diagnosed early with hyperemesis gravidarum. The widal slide method to test antibody of pregnant women was chosen because this method is still commonly used in private health centers or Puskesmas.

II. Method

This research are descriptive type with laboratory observation. In this study, the sample of this study was serum / plasma of pregnant women who did not experience remittance fever (typical of typhoid fever), but only experienced general symptoms of hyperemesis gravidarum such as nausea, vomiting, heartburn, headache, weakness, and dehydration. . , are currently not receiving typhoid fever specific therapy, and do not know for sure whether they have had typhoid fever in the past 1 year.

This research was conducted at the Health Analyst Laboratory of Stikes Panrita Husada Bulukumba, but the sampling process was carried out by visiting pregnant women at their residence. A total of 20 blood samples in the form of serum / plasma from pregnant women with complaints of excessive nausea and vomiting during pregnancy or what is known as hyperemesis gravidarum between the ages of 24 years to 43 years are taken and stored in tubes containing anticoagulants and stored. In the coolbox, it is then distributed to the health analyst laboratory to check the widal slide method.

III. Results and Discussion

Antibody levels for *Salmonella* sp. contained in the serum / plasma of pregnant women with early diagnosis of hyperemesis gravidarum obtained from the slide method widal examination using a sample variation of 20ul, 10ul, 5ul, and the amount of reagent used was 40ul (one drop of reagent).

A total of 20 samples were examined for blood, found 16 pregnant women who had positive antibodies against *Salmonella* sp. with positive reactions to total O antigens as many as 12 people and positive reactions to total H antigens as many as 12 people. 1/160 titer of O antigen is positive for new infections and for febrile patients Typhus (recurrent infection) must be done a second examination, this is because it uses an agglutination reaction, so it is meaningless if it is done in one examination. It would be more meaningful if widal examination was done twice, namely in the acute phase and 7-10 days after that phase. The reason is, agglutinin O increases significantly approximately 8 days after the onset of fever on the first day. If there is an increase in the titer of 1/320 O antigen, the result is a significant positive. Agglutinin O usually disappears after 6 months to 1 year, while agglutinin H titer decreases slowly over 1 or 2 years. Therefore, agglutinin H titres in people who have been vaccinated or come from endemic areas have a lower diagnostic value.

In this study 12 samples were positive for O antigen for detecting *Salmonella* Typhi O antigen (serogroup D), 5 samples for positive AO antigen for detecting *Salmonella* Paratyphi A antigen (serogroup A), 4 samples for positive BO antigen for detecting *Salmonella* O. Paratyphi Antigen B (serogroup B), and 2 positive samples of CO antigen to detect *Salmonella* Paratyphi C antigen (serogroup C1). Furthermore, 11 samples of positive H antigen to detect *Salmonella* Typhi H antigen (serogroup D), no positive AH antigen samples to detect *Salmonella* Paratyphi A antigen (serogroup A), 5 positive BH antigen samples to detect *Salmonella* H Paratyphi B antigen (serogroup B) , and no samples were positive for CH antigen for detection of *Salmonella* Paratyphi C antigen (serogroup C1).

If the number of positive samples is grouped based on the results of positive reactions to O and H antigens, a percentage of 80% will be obtained from the number of samples tested. The formula is as below:

$$X = \frac{\alpha}{n} \times K$$

$$X = \frac{16}{20} \times 100\%$$

$$X = 80\%$$

The percentage details are shown in table 2 below:

Table 1. Table Styles

Positive Reaction to Antigen	The number of positive samples based on O and H antigens	
	Total	Percentage (%)
O series antigen	4	20
O and H series antigen	8	40
H series antigen	4	20
Negative	4	20

The table shows that there was an increase in antibodies against *Salmonella* sp. in the majority of serum/plasma of pregnant women with a clinical diagnosis of hyperemesis gravidarum. The number of pregnant women who are positive for *Salmonella* sp. as many as 80% with initial infection as much as 20%, infected as much as 40%, had a history of previous infection as much as 20% and no infection as much as 20%.

Pregnant women are very sensitive to infection from various microorganisms. Physiologically, the immune system in pregnant women decreases, possibly due to the tolerance of the mother's immune system to the baby, which is a semi-allogeneic tissue. Although it has no effect clinically. Intra-uterine infant immune system is only formed at 12 weeks of gestation, then increases and at 26 weeks gestation is almost the same as the immune system in pregnant women themselves. During the perinatal period the baby gets antibodies that are owned by the mother, but after 2 months these antibodies will be reduced. Anatomically and physiologically there are changes in the kidneys and urinary tract, making it easier for infection to occur. Infections can be caused by bacteria, viruses and parasites. Meanwhile, transmission can occur intrauterine, during delivery or after birth. Transmission can be through the transplacenta or through the bloodstream or amniotic fluid. Typhoid fever is a health problem in developing areas because it is closely related to poverty, low knowledge, poor hygiene and sanitation¹.

The use of the widal test as a routine serological examination for the diagnosis of typhoid fever in various endemic areas, however, still has weaknesses both in terms of sensitivity and specificity². However, almost all experts agree that the increase in agglutinin titer is more or equal to 4 times, especially agglutinin O or agglutinin H is an important diagnostic value for typhoid fever. A high increase in agglutinin titer in one specimen does not differentiate whether the infection is a recent or old infection. Likewise, an increase in agglutinin titres especially agglutinin H does not have important diagnostic significance for typhoid fever, but can still assist and diagnose suspected typhoid fever in adult patients from non-endemic areas or in children under 10 years of age. in endemic areas, because in this group of patients the possibility of contact with *Samonella* Typhi at the subinfection dose is still very small. One of the very important drawbacks of using the Widal test as a means of supporting the diagnosis of typhoid fever is the rather low specificity and difficulty in interpreting the results, because many factors influence the increase in titer.

A false negative result can be caused by malnutrition, which can inhibit antibody formation. During the examination during the disease, agglutinin is only present in the blood after the patient shows symptoms for approximately one week and the peak is at week 5 or 6. There are certain diseases that can accompany typhoid fever that cannot produce antibodies, such as agammaglobulinemia, leukemia, and carcinoma. continue. Early treatment with antibiotics such as the use of anti-microbes, immunosuppressants or corticosteroids can also inhibit antibody formation.

False positive results can occur due to cotype or typhoid vaccination, previous clinical / subclinical infection by *salmonella* can support a positive result of Widal's test, although with a low titer result, the anamnestic reaction is an increase in agglutinin titer against typhoid *salmonella* due to infection. disease with non-typhoid fever in carriers. , cross-agglutination because several *salmonella* species can contain the same O and H antigens so that the agglutination reaction in one

species can cause agglutination reactions in other species, the concentration of the antigen suspension affects the results of the widal test, the salmonella strain used for local salmonella strain antigen suspension is better than the suspension from other strains.

IV. Conclusion

Based on the results of research on detection of salmonella sp. Antibodies in pregnant women with early diagnosis of hyperemesis gravidarum using the widal test slide method, the conclusion is 80% of salmonella sp. in pregnant women with an early diagnosis of hyperemesis gravidarum

Provide a statement that what is expected, as stated in the "Introduction" chapter can ultimately result in "Results and Discussion" chapter, so there is compatibility. Moreover, it can also be added the prospect of the development of research results and application prospects of further studies into the next (based on result and discussion).

Acknowledgment (HEADING 5)

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Supplementary Material

Tabel Hasil Pemeriksaan antibodi uji Widal metode slide

NO	Kode	umur	Titer Antibodi								Kesimpulan
			O	AO	BO	CO	H	AH	BH	CH	
1	HR	25	1/320	1/160	-	-	1/320	-	-	-	Positif (+)
2	AM	25	-	-	-	-	-	-	-	-	Negatif (-)
3	YR	28	-	1/160	-	-	-	-	-	-	Positif (+)
4	RA	24	1/320	-	-	1/160	1/320	-	-	-	Positif (+)
5	FN	25	1/320	1/160	1/320	-	1/320	-	1/160	-	Positif (+)
6	HA	24	1/160	1/320	-	-	1/160	-	1/320	-	Positif (+)
7	NY	28	1/160	-	-	-	-	-	-	-	Positif (+)
8	TR	30	-	-	-	-	1/320	-	-	-	Positif (+)
9	FA	25	1/160	-	1/160	-	1/160	-	-	-	Positif (+)
10	MT	25	-	-	-	-	-	-	-	-	Negatif (-)
11	HK	22	1/320	-						-	Positif (+)
12	NA	26	1/160	-	1/320	1/160	1/320	-	1/320	-	Positif (+)
13	SR	29	1/160	1/320	-	-	-	-	1/320	-	Positif (+)
14	IR	24	-	-	-	-	-	-	-	-	Negatif (-)
15	MU	31	1/320	-	1/320	-	1/320	-	1/320	-	Positif (+)
16	HS	43	1/320	-	-	-	-	-	-	-	Positif (+)
17	FT	31	-	-	-	-	-	-	-	-	Negatif (-)
18	NB	36	-	-	-	-	1/320	-	-	-	Positif (+)
19	FT	37	-	-	-	-	1/320	-	-	-	Positif (+)
20	IS	28	-	-	-	-	1/160	-	-	-	Positif (+)
Control Negatif			-	-	-	-	-	-	-	-	Negatif (-)

Dokumentasi Penelitian:



Lembar Persetujuan Etik Penelitian:



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Komisi Etik Penelitian Kesehatan Politeknik Kesehatan Makassar dalam upaya melindungi hak asasi manusia subyek penelitian kesehatan, telah mengkaji dengan teliti dan seksama protokol yang berjudul :

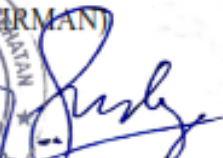
The Ethics Commission of the Health Polytechnic Makassar, with regards of the protection of Human Rights and welfare in medical research, has carefully reviewed the research protocol entitled :

"Deteksi Antibodi Salmonella sp. pada ibu hamil dengan diagnosa awal Hiperemesis gravidarum menggunakan uji widal metode slide"

Peneliti Utama : Dzikra Arwie, S.Si., M.Kes
Principal Investigator

Nama Institusi : Stikes Panrita Husada Bulukumba
Name of the Institution

Telah menyetujui protokol tersebut di atas
Approved the above-mentioned protocol

Makassar 06 Oktober 2020
(CHAIRMAN)

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Dengan Hormat,

Dalam rangka melaksanakan Tri Dharma Perguruan tinggi pada Stikes Panrita Husada Bulukumba, maka dengan ini kami menyampaikan permohonan etik penelitian dosen yang namanya tersebut dibawah ini :

Nama : Dzikra Arwie, S.Si, M.Kes
NIDN/NIDK : 0924078805
Judul Penelitian : Deteksi Antibodi Salmonella sp.pada Ibu Hamil dengan diagnose awal Hiperemesis Gravidarum menggunakan Uji Widal Metode Slide

Demikian disampaikan, atas berkenaan dan kersama yang baik diucapkan terimakasih.

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