

RELATED FACTORS TO SEPSIS NEONATORUM FOR NEWBORN IN HOSPITAL

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ABSTRACT

Background: The occurrence of infection in newborn babies may cause death if left untreated. Sepsis neonatorum is one of the neonatal infection diseases that remain unsolved as WHO also report a high case fatality rate of 40% due to sepsis neonatorum. In most cases, sepsis neonatorum was undetected so it led to death. Based on the Indonesia Demography and Healthy Survey data of 2013, the number of death baby reached 32-40 per 1000 of birth.

Aims: The purpose of the research is to describe the factors of Sepsis Neonatorum that is happened earlier such as age of the mother, kind of birth, the mother's disease history, the antenatal care, the gestational age.

Material & Method: Design study is descriptive. The research is a documentation study and the method applied is by gaining the sample called total sampling. The subject of the research is 80 baby that diagnose sepsis neonatorum at The Government Hospital Dr. M. Jamil, Padang. The research begin on february till july 2017. The instrument that is used is observation sheet.

Results: Age of mothers are less than 20 years old and more than 35 years old risk (58.8 %), the kind of birth or baby born with certain actions (45%), the mother's disease history (63.8%), the antenatal care insufficiently (53.8%), baby with low birth weigh (47.5%) and the premature baby (53.8%).

Conclusion: The mother's disease history is the most common cause of sepsis in infants in hospital. Suggestion for the medical is to higher the effort of preventive by giving the education related to the mother's factors of the sepsis neonatorum.

Keywords : *Babyborn, Sepsis Neonatorum, Hospital*

INTRODUCTION

Maternal and child health issues are a national issue that needs to be given top priority as it greatly determines the quality of human resources in future generations. Children, especially babies, are more susceptible to disease and unhealthy living conditions. Therefore, efforts are made by various parties to improve the health of infants, especially infants during the perinatal period (Ministry of Health, 2015).

The government's efforts to improve maternal and child health are also set forth in the program, one of which is sustainable development goals (SDG's) or new development programs that encourage shifting changes toward sustainable development based on human rights and equality to promote social, economic development and the environment. One of the goals of SDG's is to reduce infant and under-five mortality rates by 25 per

1,000 live births within 2030 (SDG's, 2016).

Infant mortality is one of the most important indicators to measure the success of maternal and child health programs. Infant mortality rate (IMR) is the number of infant mortality in one year per 1000 live births (Badan Pusat Statitik, 2014). Death in the neonatal period (0-20 days) has a large contribution to the IMR. It is estimated that 75% of these deaths occur in the 0-7 days after birth and 28% of deaths are in the 0-28 day period (Lawn, 2007).

According to the World Health Organization (WHO) report (2015), the infant mortality rate is 31.7 per 1000 live births. In Africa and the Mediterranean world is the region with the highest infant mortality rate of 28 per 1000 live births (Naher & Khamel, 2013). In 2012, at the ASEAN level, the infant mortality rate in Indonesia is 35 per 1000 live births, almost 5 times the infant

mortality rate from Malaysia, almost 2 times compared to Thailand and 1.3 times compared to the Philippines.

According to the Indonesian Demographic and Health Survey (SDKI) 2013, the infant mortality rate is 359 per 100,000 live births. Infant and toddler mortality rates are maximum of 12 and 25 per 1000 live births by 2030. Whereas based on data of IDHS in 2013, infant and under five mortality rate reaches only 32 and 40 per 1000 live births. Most infant deaths occur under the age of 1 month (60%), while the largest child mortality under the age of 1 year (80%) (SKDI, 2013). And west sumatera province amounted to 27 per 1000 live births (West Sumatra Health Office, 2013).

Infection is one of the important causes of high mortality rates of newborns around the world. Especially in developing countries with infections as the main cause (WHO, 2015). Infection in the neonate rapidly spread into a common infection. However, this diagnosis can be established if we are alert enough to a disorder of neonatal behavior that is often a sign of the onset of a common infection. Neonates, especially LBWs who can survive for the first 72 hours and the baby does not suffer from certain diseases or congenital abnormalities, but because of infection (Abdurrahman *et al.*, 2007).

Some signs and symptoms are include lazy drinking, anxiety, increased respiratory rate, low birth weight, CRT > 2 seconds, less movement, vomiting and diarrhea. In addition it can occur edema, sclerema, jaundice, seizures, increased body temperature. In LBW infants there is often hypothermia and sclerema (Mayetti, *et al.*, 2010).

Newborns are born to four weeks of age, usually born at 38 weeks gestation to 42 weeks. Newborns must fulfill a number of developmental tasks to obtain and maintain physical existence separately from their mother (Wong, 2011). Prevention of infection is an important part of every component of care in the newborn. Newborns are more susceptible to infection because of immature immune systems and other factors. Therefore, due to failure to follow the principle of infection prevention will be very dangerous for the neonate (Aminullah, 2012).

Neonatal sepsis is a severe infection that affects the neonate with systemic symptoms and there are bacteria in the blood. The course of sepsis disease can be rapid so often it is not monitored without adequate treatment

so that neonates can die within 24 to 48 days. The clinical manifestations of neonatal sepsis are not specific, sometimes the symptoms show no signs of infection (Aminullah, 2012).

Complete blood laboratory results show leukopenia ($<5000 / (\text{mm})^3$) and tab and neutrophil > 0.2 ratios can help diagnose. The C-Reactive Protein examination shows an increase due to inflammation caused by infection or tissue damage. The diagnosis of sepsis in newborns is categorized into 3, namely Possible / Suspect sepsis (there are 3 clinical symptoms and the presence of laboratory abnormalities), and proven (there are 3 positive clinical and blood cultures) (Sarwono, Damanik & Indarso, 2008; Siakwa, Semuatu & Kpikpitse, 2014; Mayetty, dkk, 2010)

Clinical manifestations of sepsis in infants are born based on pathophysiology and the journey time is divided into two, i.e. early onset sepsis <72 hours and slow onset sepsis >72 hours. In early-onset sepsis, abnormalities are found on the first day of life, in which the infection occurs vertically due to maternal illness or infections suffered by the mother during labor or delivery. Early onset sepsis can be caused by various factors, such as maternal factors and fetal risk factors, whereas slow-onset sepsis is usually influenced by environmental factors, such as invasive procedures in infants, contact with infections, poor cleanliness of the room and others (Sulistijono, 2013).

The incidence of neonatal sepsis is 1-10 per 1000 live births and the figure increases to 13-27 per 1000 live births in infants with low birth weight (2-4 times higher). With a mortality rate of 15-40% in early-onset neonatal sepsis and 10-20% in advanced-onset neonatal sepsis (Sulistijono, 2013).

Infant mortality due to sepsis is still not showing significant improvement, this is because early diagnosis of sepsis is difficult to enforce. Newborns who are exposed to sepsis will rarely see specific signs and symptoms. The blood-bleeding examination, which is a diagnosis, takes 3-5 days to get results. Similarly, investigations such as C reactive protein, I/T ratio, etc. are not specific and difficult to use as a guide in diagnosis. Circumstances will cause delays in treatment that will result in infant mortality or ending disabilities requiring further treatment (Aminullah, 2012).

Research conducted by Roeslani *et al.*, (2013) on risk factors for early-onset neonatal sepsis, in Cipto-

Mangunkusumo Hospital Jakarta, suggests that factors closely related to the occurrence of early-onset neonatal sepsis consist of several maternal factors including amniotic membranes early over 24 hours, high temperature > 38C fever, and gestational age <37 weeks (prematurity). The results of this study are also in line with research by Wardin (2014), saying that the maternal age ≤ 20 years and > 35 years, the type of labor, premature rupture of membranes, and a history during pregnancy depicting maternal factors associated with early-onset neonatal sepsis. And another study of early-onset neonatal risk factors in neonates by Sulistijono, (2013), in RS Dr. Saiful Anwar Malang, said that maternal risk factor premature rupture is a significant factor in early-onset neonatal sepsis.

Research conducted by Sulistijono, E. (2013) in RS Dr. Saiful Anwar Malang, said that low birth weight risk 7.4 times the occurrence of sepsis that illustrate about baby factors. Research conducted at RSUP Sanglah, Denpasar has showed that low birth weight and gestational age strongly influenced teraset early-onset neonatorum sepsis.

After conducting a preliminary study at RSUP M djamil Padang, in April 2017, data from medical records showed that infectious diseases were the highest cause of infant mortality treated in perinatology. In 2014 to 2015 has increased where in 2014, 50 babies who have sepsis and in 2015, 60 babies who have sepsis. While in the year 2016 has increased by 80 from January to December 2016. Although not always a significant increase in the increase, but sepsis neonatorum needs to be overcome to reduce mortality in infants.

Based on the above background, researchers are interested to examine more about the description of the occurrence of early sepsis neonatorum events in newborns in perinatologist dr. M. Djamil Padang.

Research variables based on the factors described above are infections during pregnancy such as maternal age, type of delivery, history of illness during pregnancy, and history of antenatal examination and infant factors such as birth weight and gestational age.

RESEARCH METHODS

The type of research used is descriptive that is a method

of research done by describing a particular event (Nursalam, 2011). The sample is selected using Total Sampling. Data collection from secondary data form a of data collected by researcher about medical record number, maternal age, gestational age, low birth weight, maternal birth history, maternal disease history, antenatal care.

RESULT

Table 5.1 Frequency Distribution of Respondents by Age of Mothers with Newborns Sepsis neonatorum in Hospital Dr. M. Djamil Padang

Age of Mother	Frequency (f)	Percentage (%)
High Risk	33	41.2
No Risk	47	58.8
Total	80	100.0

Tabel 5.2 Frequency Distribution of Type of Labor In Newborns Sepsis neonatorum in Hospital Dr. M. Djamil Padang

Type of labor	Frequency (f)	Percentage (%)
Spontaneous/normal	44	55
SC/induction/forcep	36	45
Total	80	100.0

Table 5.3 Frequency Distribution of Maternal Diseases with Newborns Sepsis neonatorum in Hospital Dr. M. Djamil Padang

Maternal Diseases	Frequency (f)	Percentage (%)
No	29	36.2
Yes	51	63.8
Total	80	100.0

Tabel 5.4 Frequency Distribution of Antenatal Care for Newborns Sepsis neonatorum in Hospital Dr. M. Djamil Padang

Antenatal care	Frequency (f)	Percentage (%)
Regularly	37	46.2
Irregularly	43	53.8
Total	80	100

Tabel 5.5 Frequency Distribution of Birth Weight Newborns Sepsis neonatorum in Hospital Dr. M. Djamil Padang

Birth Weight	Frequency (f)	Percentage (%)
Normal	42	52.5
Low birth Weight	38	47.5
Total	80	100.0

Tabel 5.6 Distribusi Frekuensi Responden Menurut Kejadian usia kehamilan di RSUP Dr. M. Djamil Padang Tahun 2016

Gestational Age	Frekuensi (f)	Percentage (%)
Prematurum	43	53.8
Matur	23	28.8
Post matur	14	17.5
Total	80	100.0

DISCUSSION

1. Age of mother

Results of research on the incidence of early-onset neonatal sepsis in Dr. M. Djamil Padang in 2016 shows that most maternal age (58.8%) are at risk of age < 20 and > 35 years, and nearly half of the mother's age (41, 2%) is productive or not at risk (20 -35 years old). The results of this study are in line with the research conducted by Mayanda (2015) showing the result that maternal age is at risk (< 20 and > 35 years) as much

(38.1) and low-risk age (20-35 years) (61.9%)

Mother's age can be classified into two: productive age or no risk age (20-35 years) and high risk age (< 20 or > 35 years). Age 20-35 years is known as healthy reproduction and the safest relative in terms of healthy reproduction where a mother is safely contained if it is well maintained during pregnancy (Gerugun, Adam & Losu, 2014).

High-risk age (< 20 or > 35 years), at < 20 years of age is at risk because the mother is not ready medically (reproductive organs) or mentally. Maternal age < 20 years of the uterus and pelvis of the mother have not developed well and will result in fear of pregnancy and delivery of pregnancy. Likewise with age > 35 years physically the mother suffered a setback to undergo a pregnancy and is a predisposing factor of the occurrence of preeclampsia and will cause anxiety to pregnancy and childbirth and reproductive devices too old mother to get pregnant (Rahma & Armah, 2014).

In this study there are many age-maternal age at risk or the age of pregnant women less than 20 years and over 35 years, where pregnancy at a young age is a risk factor is due to immature reproductive organs to conceive (endometrium not perfect) while at age above 35 year-old physically decline mother to undergo pregnancy and is a predisposing factor of the occurrence of preeclampsia and will cause anxiety to pregnancy and childbirth as well as mother's reproductive tools too old to get pregnant.

2. Type of Labor

Results of research on the incidence of early-onset neonatal sepsis in Dr. M. Djamil Padang in 2016 showed that almost half of the mothers (45%) performed acting / caesarean and half-mother (55%) of mothers did normal labor. The results of this study are in line with a study conducted by Simbolon in 2008 that the incidence of neonatal sepsis, the type of labor with the action or normal is almost the same where only slightly more in infants with a history of labor acts.

The results of this study are not in (Simbolon, 2008) line with the theory that babies born with more risky action occur sepsis neonatorum. This happens because of contamination of germs that occur after birth, such as the tools used during labor delivery. Saifuddin stated that newborns are at high risk of infection if a baby with a history of birth with action is found. Infection can be

obtained from infants outside the mother's uterus, such as contaminated birth aids (Wiliar, 2013).

According to the researchers' analysis, many mothers who give birth in a normal way will reduce the risk of infection in infants, and can interfere with early-onset neonatal sepsis.

3. History of maternal disease

Results of research on the incidence of early-onset neonatal sepsis in Dr. M. Djamil Padang in 2016 shows that most mothers (63.8%) have a history of maternal and maternal disease (36.2%) have no history of maternal disease. The results of this study in line denagan research Ruswandiyani (2008) showed more than half of 58% have no history of disease.

Blood pressure in pregnancy affects birth weight Low blood pressure of pregnant women is associated with vascular disorders that can result in low nutritional and oxygen intake required by the fetus. This of course can lead to disruption to normal fetal growth process. High blood pressure of pregnant women ($\geq 140 / 90$ mmHg) may also lead to intrauterine fetal growth disorder which will certainly impact on birth weight. Globally, hypertension in pregnancy is also one of the three leading causes of maternal mortality and morbidity. Mortality and morbidity due to hypertension in pregnancy is also still quite high in Indonesia. This can certainly contribute substantially to maternal mortality and infant mortality, which according to Indonesia's demographic and health surveys (2014) is still high, namely the Maternal Mortality Rate (AKI) 228 PER 100,000 live births. Indicators of obsessive and gynecological service quality in a region are based on maternal mortality and infant mortality rate.

Based on the results of the study found that most (63.8%) of the diseases suffered by mothers during pregnancy will affect the health of the fetus and mother. Where mothers who suffer from diseases during pregnancy will be obstacles supply of nutrients for the needs of the fetus so that the risk of having a baby with low birth weight. Based on research are conducted in the field of diseases suffered by many women hypertension, KPD, pre-eclampsia / eklampsia.

4. Antenatal Examination History

Results of research on the incidence of early-onset neonatal sepsis in Dr. M. Djamil Padang in 2016 showed

that nearly half of mothers (37%) had a history of regular antenatal examination, and half of them mother (53.8%) had a history of irregular antenatal examination. The results of this study are in line with the results of Replita (2011) research that almost half of respondents (31.9%) are irregular in antenatal care visits and a small fraction (19.2%) are regularly in antenatal care supervision.

ANC is the visit of pregnant mother to midwife or doctor as early as possible since she felt pregnant to get antenatal care / care. At each antenatal visit (ANC), the officers collected and analyzed data on the condition of the mother through anamnesis and physical examination to get the diagnosis of intra uterine pregnancy and the presence or absence of problems or complications (Saifuddin, 2010).

5. Low Birth Weight

Results of research on the incidence of early-onset neonatal sepsis in Dr. M. Djamil Padang in 2016 showed that half of the babies are (52.5%) normal, and half of the babies (47.5%) LBW. This study is in line with wiliar (2013) said most neonatal sepsis (65.1%) in infants weighing 2500-4000 gr and born with 37-42 weeks' gestation (74%).

This is in contrast to the theory that one of the risk factors for sepsis is low birth weight (BBLR) and premature infant. This occurs because the babies are low birth weight and premature maturation of the body organs (liver, lung, digestion, brain, immune system) is still immature so can become a predisposing factor of infection.6 Previous research at RS. Dr. Soetomo, that LBW in infants has a sepsis risk of 2.75 times higher. And premature labor is also 4 times higher risk than babies are born enough months. Pregnancy age results of research on the incidence of early-onset neonatal sepsis in Dr. M. Djamil Padang in 2016 showed that most mothers (53.8%) with gestational age were less than months, nearly half of mothers (28.8%) gestational age and mothers (17.5%) gestational age. Results of research are in line with pediatrics (2010) 60% gestational age less months / 37 weeks.

The duration of normal pregnancy in hiutng from the first day of last menstruation (HPHT). Sometimes pregnancy ends prematurely and there are times when more than normal time. The gestational age according to WHO is divided into three, namely premature (<37 weeks), mature (37-42 weeks), and post mature (> 42

weeks) (Rahma & Armah, 2013). Premature delivery is a major problem due to vital tools (brain, heart, lungs, kidney) has not been perfect, so have difficulty adaptation to grow and develop well (Manuaba, 2007). In premature infants it often does not produce adequate amounts of surfactant, so the alveoli does not remain open where between moments breathing the lungs completely deflate, resulting in respiratory distress syndrome.

Pregnancy mature / enough months is the gestational age between 37 to 42 weeks and this is the period during which a normal delivery occurs. In the early pregnancy the function of the organs is complete and the fetus is also ready to live outside the womb (Rahma & Armah, 2013).

Pregnancy post mature / month is a pregnancy that passes 42 weeks or pregnancy over time. In post-pregnancy the function of the placenta is not maximal anymore due to the aging process. The process of aging can lead to oxygen transport and supply of food from mother to fetus is also decreased. In addition, the amount of amniotic fluid is also reduced which can lead to meconium aspiration in the fetus.

In the study showed that most respondents gestational age less months (67%), Babies born less months have organs and body tools that have not normal to survive outside the womb. The younger the gestational age, the function of the baby's organs is less than perfect. Due to the absence of proper functioning body organs such as respiratory system. The emergence of low birthweight in infants less months due to not yet maximal levels of maturity function of the body's organ systems making it difficult to adapt with life outside the womb. Infants born with more months of LBW occurrence can be caused by placental function that is not maximal anymore due to the aging process resulting in the process of transport of oxygen and food from mother to fetus disrupted, resulting in the fetus lack of oxygen and result in low birth weight.

Narasi Profil Kesehatan Kota Padang Tahun

CONCLUSION

Most (58.8%) of mothers aged <20 years and> 35 years old in RSUP Dr. M. Djamil Padang, Most (55%) of mothers give birth normally in RSUP. dr. M.Djamil Padang In 2017, most (63.8%) of mothers have a history of maternal disease in Dr. M. Djamil Padang, Most

(53.8%) of mothers have a history of irregular antenatal examination in RSUP. dr. M.Djamil Padang Year 2017 and Half (47.5%) babies with low birth weight babies in RSUP. dr. M.Djamil Padang Year 2017.

ACKNOELEDGMENT

Thanks to the rector of the university andalas who has provided the opportunity and financed my journey to publish the results of this research through oral presentations in 3rd Asia Pacific Pediatric Nursing Conference Bangkok, Thailand. Thanks to Dean of Faculty of Nursing, Hospital Dr. M. Djamil Padang and my team.

In the present study, elevated plasma MDA level was found in T2DM patients compared to healthy control subjects. Among three groups of T2DM, T2DM with microvascular complications showed highest increase in MDA level compared to healthy controls. Thus the observed increase in MDA levels may be due to the enhanced production of lipid peroxides and their release in circulation that leads to increased lipid peroxidation which is responsible for T2DM progression and its complications and can be a risk factor for development of cancer Jamuna Rani & Mythili, (2014) stated that diabetic complications are developed with increased activity of free radical – induced lipid peroxidation and accumulation of lipid peroxidation products (Hisalkar, Patne, Fawade, 2012).

CONCLUSION

This investigation suggest that hyperglycaemia in T2DM leading to OS result in an increase in lipid peroxidation. Increase in lipid peroxidation reveals increased production of free radicals and its insufficient removal by antioxidants. Enhanced MDA level is a prognostic factor for the risk of T2DM progression and its complications. Hence, lipid peroxidation can be a useful biomarker for OS for the risk of T2DM progression and its complications.

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