RISK FACTORS FOR *RESPIRATORY DISTRESS SYNDROME* IN NEWBORN BABIES

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ABSTRACT

Respiratory Distress Syndrome (RDS), also known in Bahasa as Penyakit Membran Hyaline (PMH), is a respiratory disorder commonly occurs in premature babies with symptoms such as the following like chest retraction tachypnea, cyanosis due to stagnant and worsening room air at 48-96 hours of life using a specific chest X-ray. The cause is a lack of surfactant. In Southeast Asia, the most common cause of morbidity and mortality in premature babies is RDS (Respiratory Distress Syndrome). Based on medical records data from Rumah Sakit Umum Daerah Sidikalang (Sidikalang Regional General Hospital) in 2019 for the period January to June, the number of newborn patients treated in the perinatology room was 366 (three hundred and sixty six) babies, and around 60% suffered respiratory problems like RDS. This research is an analytical observational study with a cross sectional approach. The sample population of this research was 320 newborns treated in the perinatology room at Rumah Sakit Umum Daerah Sidikalang from January to June 2019, with total sampling carried out. The results of this study showed that the risk factors Respiratory Distress Syndrome for newborns at the Rumah Sakit Umum Daerah Sidikalang are gestational age with value p 0.001, and the type of delivery with value p 0.000 and neonatal asphyxia with value p 0.000, while birth weight and gender has not been proven to be a risk factor for RDS. It is necessary to educate pregnant women to avoid caesarean section deliveries without indications.

Keywords *: RDS, risk factors, newborn babies*

INTRODUCTION

Respiratory Distress of the Newborn (RDN) or also known *as Respiratory Distress Syndrome* (RDS) also known as *Hyaline Membrane Disease* (HMD) or also known as *Penyakit Membran Hyaline* (PMH) is a respiratory disorder commonly occurs in premature babies with symptoms such as the following like chest retraction tachypnea, cyanosis due to stagnant and worsening room air at 48-96 hours of life using a specific chest X-ray. It's about 60% of newborn babies before 29 weeks' of gestation typically experience RDS. RDS is the main cause of death and morbidity in premature babies, usually after 3 – 5 days. The prognosis can be bad if prolonged ventilatory support is required, death can occur after 3 days of treatment (Betz et al., 2009).

Survei Demografi dan Kesehatan Indonesia (SDKI) in 2012 stated that the infant mortality rate in Indonesia was 32 deaths per 1000 live births in 2012. Neonatal deaths accounted for the majority of infant deaths in Indonesia. According to the SDKI, the neonatal mortality rate in Indonesia is 19 per 1000 live births. The causes of newborns death 7-28 days include; sepsis at 20.5%, birth defects/congenital abnormalities at 19%, pneumonia at 17%, prematurity and hyaline membrane disease/PMH at 14% (Bappenas, 2007).

Penyakit Membran Hyaline (PMH) is one of the causes of respiratory disorder commonly occurs in premature babies. About 1 from 20.000-30.000 case of newborns in the United States suffers by PMH. PMH is the most common cause in the first 48 hours of birth with infection, meconium aspiration syndrome, and asphyxia. Almost 50% of newborn babies with weight around 500-1500 grams (<34 weeks of gestation) can suffer PMH and the incidence is inversely proportional to the gestation period, where the more premature the newborn, it means that the higher of the incidence. PMH can cause respiratory distress symptoms that worsen within 48-96 hours and it is the main cause of death in premature babies (50-70%) (Wahyuningsih & Esty, 2009).

In addition to being related to gestational age, the incidence of PMH is also related to newborn's birth weight. Fifty to sixty percent of newborn babies at less than 29 weeks' gestation suffer from PMH, and 44% of cases are found in babies with a birth weight between 501–1500 grams. This research conducted by Wardhani et al stated that PMH increases the risk of death of babies with a birth weight of 1000-<2500 grams who are referred to RSUP Dr. Sardjito Yogyakarta (OR: 3.98, CI 95% 1.439 – 10.613) (Wardhani & Wandita, 2009).

There are four important factors that cause surfactant deficiency in RDS, namely prematurity, perinatal asphyxia, maternal diabetes, caesarean section. Respiratory insufficiency can also be caused by sepsis, pneumonia, meconium aspiration, pneumothorax, persistent fetal circulation, heart failure, and malformations involving thoracic structures such as diaphragmatic hernia (Ngastiyah, 2005).

Based on medical record data from Rumah Sakit Umum Sidikalang Kabupaten Dairi in 2019 for the period January to June, the number of newborn patients treated in the perinatology room was 366 (three hundred and sixty six) babies, and around 60% suffered respiratory problems like RDS. Based on the data above, the author is interested in researching the risk factors for *Respiratory Distress Syndrome* (RDS) in Newborn Babies at Rumah Sakit Umum Daerah

Sidikalang, Kabupaten Dairi in 2019. This Purpose of the Research is Describe the Risk Factors for *Respiratory Distress Syndrome* (RDS) in Newborn Babies at Rumah Sakit Umum Daerah Sidikalang, Kabupaten Dairi in 2019.

METHOD

This research is an analytical observational study with a cross sectional approach. In cross-sectional research, the cause or risk and effect variables or cases that occur in the research object are measured and collected simultaneously for a moment or just once at a time (at the same time), in this study there is no follow-up (Notoatmodjo, 2012). The research was conducted in Perinatology Room at RSUD Sidikalang for the period from July to December 2019. The results of this study showed that the risk factors *Respiratory Distress Syndrome* for newborns at the Rumah Sakit Umum Daerah Sidikalang. The sample population of this research for the period January to June 2019 with 366 (three hundred and sixty six) babies, with total sampling or saturation sampling. Saturation sampling means a technique for determining the sample if all members of the population are used as a sample (Feptriyanto, 2018). So the number of samples in this study is 366 (three hundred and sixty six) babies. The data in this research is only one type of data, namely secondary data. Secondary data is data obtained from the medical records data of RSUD Sidikalang with the health history of newborn babies which is relevant to the research objectives. In this research, used statistical tests by using computer software to see whether birth weight, gestational age, gender, type of delivery and neonatal asphyxia (independent variables) are at risk for the incidence of *Respiratory Distress Syndrome* (dependent variable) using Chi-Square at the level 95% real ($\alpha = 0.05$).

RESULTS AND DISCUSSION

Newborn babies treated in the Perinatology room at RSUD Sidikalang for the period January to June 2019 based on data from the Perinatology room is 366 (three hundred and sixty six) babies. After searching the medical record data from RSUD Sidikalang Medical Records unit, only 320 pieces of data were found. Thus the amount of subjective data analyzed in this study was 320 babies. So the sample for this study was 320 babies

Respondent Characteristics

After data was collected from medical records, the characteristics of the newborn were obtained as follows:

Table 1. Characteristics of Newborn Babies

No	Karakteristik	f	%
1	Berat Badan Lahir		
	BBLR	103	32,2
	Normal	217	67,8
	Jumlah	**320**	**100,0**
2	Usia Kehamilan		
	Prematur	57	17,8
	Matur	250	78,1
	Postmatur	13	4,1
	Jumlah	**320**	**100,0**
3	Jenis Kelamin		
	Laki-Laki	191	59,4
	Perempuan	129	40,3
	Jumlah	**320**	**100,0**
4	Jenis Persalinan		
	Partus Normal	107	33,4
	Sectio Caesarea	213	66,6
	Jumlah	**320**	**100,0**
5	Asfiksia Perinatal		
	Tidak asfiksia	69	21,6
	Asfiksia Ringan	132	41,3
	Asfiksia Sedang	44	13,8
	Asfiksia Berat	75	23,4
	Jumlah	**320**	**100,0**

Based on the table above, it can be seen that the characteristics of the majority of respondents were normal weight, mature gestational age, male gender, 66.66% were born via caesarean section and only 21.6% did not experience asphyxia.

Occurrence of *Respiratory Distress Syndrome*

The incidence of *Respiratory Distress Syndrome* at RSUD Sidikalang is relatively high. There were 213 babies (66.6%) who suffered *Respiratory Distress Syndrome* as seen in the picture below.

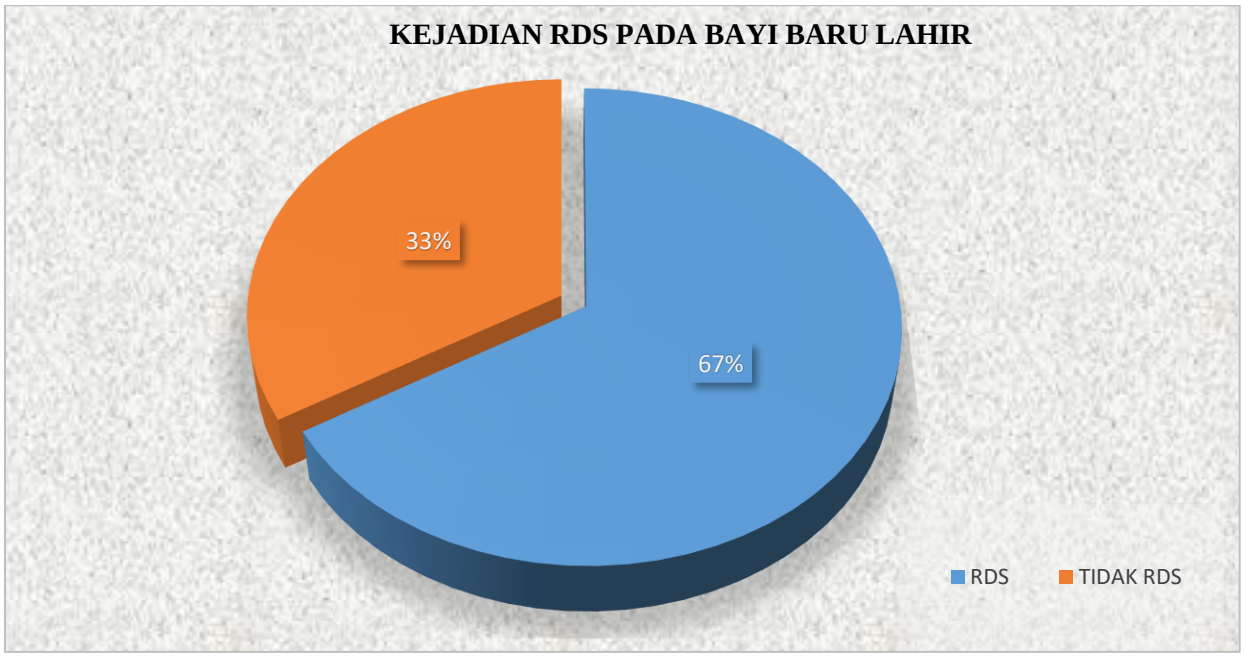

Figure 1. Incidence of Respiratory Distress Syndrome in Newborn Babies

Bivariate Analysis

The results of this research study showed that there was no relationship between newborn babies birth body and the incidence of RDS in newborn babies, *p value* = 0.965, there was a significant relationship between gestational age and the incidence of RDS in newborn babies with *p value* = 0.001, there was no relationship between gender and the incidence of RDS. in newborns *p value* = 0.895, there is a significant relationship between the type of delivery and the incidence of RDS in newborns with *p value = 0.000*, there is a significant relationship between neonatal asphyxia and the incidence of RDS that *the p value is 0.000*

Discussion

The relationship between Birth Weight and *Respiratory Distress Syndrome*

Low birth weight is one of the causes of quite high morbidity and mortality rates in neonates. The results of this research showed that there was no significant relationship between birth weight and the incidence of *Respiratory Distress Syndrome* . The birth weight of newborns is 32.2% with low birth weight. Baby with Berat Badan Lahir Rendah (BBLR) with a weight around of 2000-2499 gr. Babies born with a weight of 2000-2500 grams are still very likely to live without serious residual effects, compared to babies born with a weight of 1000-1500 grams and 1500-2000 grams, it is very difficult to live and requires intensive care.

Relationship between Gestational Age and *Respiratory Distress Syndrome*

The research results showed that gestational age is a risk factor for *Respiratory Distress Syndrome*. The majority of premature pregnancies are 28-30 weeks. This research is in line with *Feptriyanto's research* in 2018, that the risk factor for the occurrence of *Respiratory Distress Syndrome* (RDS) in neonates at RSUD dr. R. Goeteng Taroenadibrata Purbalingga is that gestational age has the largest OR value, namely 5.666 (OR > 1) [7]. *Respiratory Distress Syndrome* occurs in premature or preterm babies, due to lack of surfactant production. This surfactant production begins at the 22nd week of pregnancy, the younger the gestational age, the greater the possibility of *Respiratory Distress Syndrome* . and atherosclerosis of blood vessels. Decreased nutritional ability of the placenta, the placenta causes changes in anaerobic metabolism, in this situation it will cause *Respiratory Distress Syndrome* (fetal distress) (Manuaba & Gde, 2012).

Relationship between Gender and *Respiratory Distress Syndrome*

This research showed that there is no significant relationship between gender and the incidence of *Respiratory Distress Syndrome* in newborn babies. This research is in line with research by *Marfuah, Wisnu Barlianto, Dian Susmarini* in 2013 regarding Risk Factors for Respiratory Emergency in Neonates at RSD DR. Haryoto, Lumajang Regency showed the results that gender did not have a significant relationship with the incidence of respiratory emergencies in neonates, namely asphyxiation with *a P value* of 0.678 (Marfuah et al., 2013).

Relationship between type of delivery and *Respiratory Distress Syndrome*

The results of this research showed that there was a significant relationship between the type of delivery and the incidence of *Respiratory Distress Syndrome* . Wahid's research in 2013 stated that the risk factors that most influence the incidence of RDS are perinatal asphyxia, gestation age 24-33 weeks, birth weight <1500 grams and Section Caesarean delivery (Wahid, 2015). The risk of developing *Respiratory Distress Syndrome* is caused by reduced lung fluid production during labor, 1/3 of lung fluid is expelled due to pressure on the chest during vaginal delivery. This is also in accordance with Setyobudi's opinion in Mitayana 2011 that anesthesia in the cesarean section can affect blood flow, perfusion or vascular extension, either directly or indirectly. One of the effects of anesthesia on the fetus is the occurrence of *Respiratory Distress Syndrome* (Mitayani, 2012).

Relationship between Asphyxia Neonatorum and *Respiratory Distress Syndrome*

The result of this research showed that neonatal asphyxia is significantly related to *Respiratory Distress Syndrome* , in line with research by Marfuah, Wisnu, Dian S in 2013 which shows that the risk factor that is significantly related to the incidence of respiratory emergencies in neonates is asphyxia with *P value of 0.0001* and OR 14.529. This means that babies born with asphyxia are at 14,529 times the risk of experiencing respiratory distress compared to babies born without asphyxia. Perinatal asphyxia or neonatal asphyxia is a condition where newborn babies fail to breathe spontaneously and regularly immediately after birth. Many factors cause this, including disease in the mother during pregnancy, such as hypertension, pulmonary disease, uterine contraction disorders. It can also be due to placental factors such as a fetus with placental abruption, or also fetal factors themselves such as abnormalities in the umbilical cord with it growing or wrapped around the neck or also compression of the umbilical cord between the fetus and the birth canal and then labor factors, namely prolonged labor or labor with certain procedures (Wong & Whalley, 2011). *Respiratory Distress Syndrome* often occurs in babies with a history of asphyxia at birth or signs of fetal distress at the end of pregnancy (Mochtar & Rustam, 2011)

CONCLUSION

The results of this research showed that the risk factors for the incidence of *Respiratory Distress Syndrome* in newborns at RSUD Sidikalang are gestational age with pvalue of 0.001, type of delivery baby with pvalue of 0.000 and neonatal asphyxia with pvalue of 0.000

Pregnant women are expected to realize that avoiding unnecessary caesarean section deliveries protects babies from the emergency of neonatal *Respiratory Distress Syndrome* . Health workers should motivate pregnant women to choose normal delivery unless there is an indication for caesarean section.

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