NEWBORN APGAR SCORE IN TERMS OF PRENATAL SCREENING RESULTS

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ABSTRACT

Pregnancy is part of the period of a woman's life. However, in pregnancy there are often unwanted complications. Complications or high risk in pregnancy estimated by 20% of pregnant women. The risk of the pregnancy developing into complications can be life-threatening. However, most complications can be prevented and managed if, the pregnant woman immediately seeks help from health workers and health workers are able to identify complications early. This study was conducted with an analytic cross sectional design at the BPM Working Area of Health Center the Kuranji Padang from July to November 2018. Research respondents were involved in total sampling, there were postpartum mothers within a span of three months after giving birth. The results of the screening were analyzed in relation to the APGAR score of newborns. The results showed that there was no significant difference in the mean of APGAR scores in the first and fifth minutes between mothers who had normal and abnormal blood pressure, weight gain, and uterine fundal height. There was a significant difference in the mean of APGAR scores in the first and fifth minutes between mothers who had normal and abnormal fetal movements and fetal heart rate. Birth status was the factor that has the greatest influence on the APGAR score of newborns. This study recommends the need for uniformity and completeness of data documentation by BPM in early detection of pregnant women and can provide integrated data to the Public Health Center so that the condition of pregnant women with high risk can be identified for further treatment.

Keywords: *APGAR score, prenatal screening*

INTRODUCTION

The process of pregnancy can be a risk for a pregnant woman and can even develop into complications if not detected and handled properly. Complications or high risks in pregnancy estimated by WHO, are experienced by 20% of pregnant women (Kemenkes RI, 2015). Based on the Indonesian Demographic and Health Survey (IDHS) in 2012, the Maternal Mortality Rate/MMR (related to pregnancy, childbirth, and the postpartum period) was 359 per 100,000 live births. The infant mortality rate/IMR that most contributed was the neonatal mortality rate (0-28 days), which was 59%. Meanwhile, the government target for reducing MMR in 2030 is 70/100,000 live births (Kemenkes RI, 2015).

Maternal mortality in Indonesia is still dominated by three main causes, namely bleeding, hypertension in pregnancy, and infection. However, the proportion has changed, where bleeding and infection tend to decrease while the proportion of hypertension in pregnancy is increasing. More than 25% of maternal deaths in Indonesia in 2013 were caused by

hypertension in pregnancy (Kemenkes RI, 2015). Cases of maternal mortality in the city of Padang have increased to 20 mothers in 2016. The highest direct cause is eclampsia and the indirect cause is related to risk factors and high risk in pregnant women (Dinas Kesehatn Kota/DKK Padang, 2017).

Risky pregnancy conditions such as anemia, hypertension, diabetes mellitus, bleeding can have an impact on the health of the fetus/baby and can be life-threatening. These risks include preterm or premature labor, low birth weight, premature rupture of membranes and stunted fetal growth (Johns & Jauniaux, 2006; Oppenraaij, et al., 2009; Leveno, et al., 2009). Low birth weight can not only occur in premature babies, but also in term babies who experience growth retardation during pregnancy (Kemenkes RI, 2015)

However, most complications can be prevented and managed if, the pregnant woman immediately seeks help and health workers are able to identify complications early. There are three types of intervention areas that are carried out to reduce maternal and neonatal mortality and morbidity, one of which is the improvement of antenatal services that are able to detect and adequately handle high-risk cases. The government has also set criteria for quality standards nationally regarding efforts to provide maternal health services, including pregnant women or antenatal services. The importance of maternal health and the optimization of maternal health services are important factors that determine the safety of the mother and fetus/infant so that pregnant women are not in a high-risk pregnancy (Kemenkes RI, 2015). Detection of high-risk pregnant women aims to find out whether pregnant women during pregnancy, childbirth or postpartum are not in a condition of complications and safe in childbirth (DKK Padang, 2017).

According to the American Pregnancy Association (2016), prenatal screening is not only based on the results of blood tests but can also be compared from risk factors, which are not aimed at diagnosing but only as a guide for further action. The Washington State Health Care Authority developed the MSS Prenatal Screening Tool. This instrument identifies various risk factors such as race, age, nutrition, prenatal visits, medical conditions including history of diabetes, hypertension, multiple pregnancies, history of birth of a baby, substance addiction, and mental health. According to Cunningham (2017), a study conducted by Victorian Clinical Genetics Services at the Murdoch Children's Research Institute and Illumina's Northern California Services Laboratory on 90,000 pregnant women using prenatal screening showed an average accuracy of almost 99% in detecting Down syndrome from 10 weeks of gestation.

The study by Raharjo, Ngo, and Muhyi (2021) showed that there was a correlation between the insidence of apgar score below 7 with prolonged labor, and there was no correlation

between the insidence of apgar score below 7 with mother's age, parity, and anemia. The study by Widarta, et al (2015) at dr. Soetomo Hospital Surabaya found that all cases of maternal death contained elements of risk factors in Kartu Skor Poedji Rochjati (KSPR) and factor of four was late. KRST was the group with the most risk factors (55.2%), followed by KRT 39.7% and KRR 5.2%. Factors that were late in detecting danger signs were found to be 82.8%, late in making decisions to refer 56.9%, and late arrival at the referral place 15.5%.

The target of high-risk pregnant women is 20% of the total number of pregnant women. In 2016, it was estimated that there were 3,688 high risk/complicated pregnant women out of 18,439 pregnant women. High risk pregnant women found and treated was 2,582 (70.01%). This coverage increased from 2015 as many as 1,544 (41.7%). The pregnant women recorded in Kuranji District which includes three working areas of the Publict Health Centre (Kuranji, Belimbing and Ambacang) is large, from 2837 pregnant women it is estimated that as many as 568 pregnant women are at risk (DKK Padang, 2017).

This study was to determine the relationship between monitoring the health of pregnant women through prenatal screening on the health condition of the baby at birth, namely the APGAR score in the Kuranji District, Padang.

METHODS

This study was conducted with an analytic cross sectional design at the active independent practice (BPM) at the Kuranji District Padang which are the working areas of the Kuranji, Belimbing and Ambacang Publich Health Centers. It was done from July to November 2018. Research respondents were involved in total sampling, there were postpartum mothers within a span of three months after giving birth. Data was collected after coordinating with BPM officers regarding data on mothers giving birth and based on visit/delivery reports. The results of the screening were analyzed in relation to the APGAR score of newborns starting from univariate to multivariate analysis with linear regression analysis.

RESULT AND DISCUSSION

Bivariate analysis was conducted to determine the relationship between the dependent variable and the independent variable. In was performed on prenatal screening variables (blood pressure, weight, uterine fundal height, fetal heart rate and fetal movement) with APGAR scores in the first and fifth minutes. The result as shown in Table 1 to Table 5

Table 1. The Mean of APGAR Score in First and Fifth Minute Newborns Based on Mother's Blood Pressure

Variable	Blood Pressure	Mean	SD	SE	p value	N
First minutes of APGAR score	Normal	7,88	0,589	0,051		134
	Abnormal	7,60	0,966	0,306	0,387	10
Fifth minutes of APGAR score	Normal	8,90	0,573	0,050		134
	Abnormal	8,70	0,949	0,300	0,307	10

Table 1 shows there is no significant difference in the mean of APGAR scores in the first and fifth minutes between mothers who had normal and abnormal blood pressure (*p value* 0.387 and 0.307 in first and fifth minute).

Table 2. The Mean of APGAR Score in First and Fifth Minute Newborns Based on Mother's Weight

Variable	Mother's Weight	Mean	SD	SE	p value	N
First minutes of APGAR score	Normal	7,87	0,590	0,056	0,822	113
	Abnormal	7,84	0,735	0,132		31
Fifth minutes of APGAR score	Normal	8,89	0,573	0,054	0,853	113
	Abnormal	8,87	0,718	0,129		31

Table 2 shows there is no significant difference in the mean of APGAR score in the first minute and fifth minute between mothers who had normal and abnormal weight gain (*p value* 0.822 and 0.853 in first and fifth minute).

Table 3. The Mean of APGAR Score in First and Fifth Minute Newborns Based on Mother's Uterine Fundal Height

Variable	Uterine Fundal Height	Mean	SD	SE	p value	N
First minutes of APGAR score	Normal	7,86	0,596	0,056	0,921	113
	Abnormal	7,87	0,718	0,129		31
Fifth minutes of APGAR score	Normal	8,89	0,573	0,054	0,853	113
	Abnormal	8,87	0,718	0,129		31

Table 3 shows there is no significant difference in the mean of APGAR score in the first minute and fifth minute between mothers who had normal and abnormal uterine fundal height (*p value* 0.921 and 0.853 in first and fifth minute).

Table 4. The Mean of APGAR Score in First and Fifth Minute Newborns Based on Fetal Heart Rate

Variable	Fetal Heart Rate	Mean	SD	SE	p value	N
First minutes of APGAR score	Normal	7,91	0,477	0,040	0,000	141
	Abnormal	5,67	2,082	1,202		3
Fifth minutes of APGAR score	Normal	8,94	0,451	0,038	0,000	141
	Abnormal	6,67	2,082	1,202		3

Table 4 shows there is significant difference in the mean of APGAR score in the first minute and fifth minute between mothers who had normal and abnormal fetal heart rate (*p value* 0.000 in first and fifth minute).

Table 5. The Mean of APGAR Score in First and Fifth Minute Newborns Based on Fetal Movement

Variable	Fetal Movement	Mean	SD	SE	p value	N
First minutes of APGAR score	Normal	7,91	0,477	0,040	0,000	141
	Abnormal	5,67	2,082	1,202		3
Fifth minutes of APGAR score	Normal	8,94	0,451	0,038	0,000	141
	Abnormal	6,67	2,082	1,202		3

Table 5 shows there is significant difference in the mean of APGAR score in the first minute and fifth minute between mothers who had normal and abnormal fetal movement (*p value* 0.000 in first and fifth minute).

The multivariate analysis was carried out to determine which variable had greatest influence on the APGAR scores of the first and fifth minute scores. It was delivery/birth status (beta value = 0.170). The result as shown in Table 6.

Table 6. Factors Affecting the Mean of APGAR Score in the First and Fifth Minutes of Newborns

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	9.271	2.158		4.296	.000
	Mother's age	-.022	.010	-.193	-2.206	.029
	Birth status	.165	.085	.170	1.929	.056
	Fetal movement	-2.122	.318	-.489	-6.679	.000
	Gestational's age	.028	.054	.039	.524	.601

This study indicate that based on prenatal screening data, the mother's condition is mostly normal. However, there are still mothers with abnormal prenatal screening data. According to Trotter, Chang and Thomson in Reeder, et.al (2012), one of the risk factors that can affect the final pregnancy outcome is prenatal factors such as maternal age, gestational age, parity status

and also includes examination of the mother's pregnancy condition. Study done by Raharjo, et.al (2021) also about a correlation between the insidence of apgar score below 7 based on maternal risk factors (prolonged labor, mother's age, parity, and anemia). Study done by Sinuraya, Nisa, Lokajaya & Puri (2017) showed that blood pressure is a very important indicator for detecting PE (preeclampsia) as a specific biomarker. Study done by Kasliwal, Kabra & Yadav (2021) also showed about low risk pregnancies to maternal condition and fetal outcome sesificaly in premature rupture of membrane.

Hight risk pregnancy also impact to neonatal conditions that shown in APGAR score newborn. Study done by Fajarriyanti (2017) showed there were several factors that influence the incidence of neonatal asphyxia at PKU Muhammadiyah Bantul Hospital, namely maternal age, parity, gestational age, delivery history and nutritional status. The incidence of infants with an APGAR score of 4-6 (moderate asphyxia) was more (85.4%). The results showed that the factor that was significantly related was maternal age (p= 0.019).

This study showed that the fetal heart rate and fetal movement has a significant difference. This study also showed that the factor with the greatest influence on the APGAR score of newborns was delivery/birth status. Birth status is included in prenatal status as one of the risk factors that need to be detected in pregnant women (Reeder, et.al, 2012). The data also shows that the highest parity of mothers is multipara (58.3%) even 16.7% with grandemultipara. Kasliwal, et.al (2021) study's showed there was 8% of babies were low birth weight up to 100th pregnant woman who had premature rupture of membrane. There wasalso showed 30% of neonatal morbidity including early onset sepsis (15%), neonatal jaundice, neonatal infection, hypoglycemia, respiratory distress. Assessment of the baby's condition based on the APGAR score is one important indicator of the success of the baby to be able to survive shortly after birth (Wong, 2009; Piliteri, 2010; Reeder, et. al., 2012). Fetal heart rate and fetal movements are direct indicators that indicate the condition of the fetus/baby to be born.

Widarta, Laksana, Sulistyono & Purnomo (2015), early detection of risk factors for pregnant women can use the Poedji Rochjati Score Card (KSPR) and prevention of factor four being late. Of the four late factors, the late factor in detecting danger signs occurs the earliest and affects the other four late factors sequentially. Danger signs can be detected from an increase in blood pressure above normal values, excess body weight, uterine fundal height that is not appropriate for gestational age, fetal heart rate and fetal movement above/below normal values. The role of health workers such as at independent practice (BPM) in assessing and fully

documenting patient data is very important to help identify risk conditions that may be experienced by pregnant women.

CONCLUSION AND SUGGESTION

Risky pregnancy conditions can have an impact on the health of the fetus/baby and can be life-threatening. The detection of high-risk pregnant women is very important because it aims to determine whether the pregnant woman is in a condition during pregnancy, childbirth or postpartum, is not in a condition of complications and is safe in childbirth. Therefore, the need for uniformity and completeness of data documentation in early detection of pregnant women and can provide integrated data to the Public Health Center so that the condition of pregnant women with high risk can be identified for further treatment. It's necessary to develop research on other risk factors that also influence the APGAR score newborn.

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