REFFERAL CASES & MATERNAL-NEONATAL OUTCOME

IN PROF KANDOU HOSPITAL-NORTH SULAWESI-INDONESIA

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Objectives : *To review the correlation between obstetric referral cases with the outcome*

Design : *Retrospective Analysis*

Setting : *Obstetrics-Gynecology Department, Prof. Kandou Hospital, Manado*

Material and methods : *Subjects are term pregnant women who referred to Prof. Kandou Hospital in 2007. Analysis was done by SPSS 17, using correlation test x^2*

Results :

It was found 173 cases with referral letter (3.1%), which 150 was High Risk Pregnancy cases (86.7%). The most frequent indication to refer was prolonged labor & PROM

The most sender was GP 135 (78%.) Most of the cases came from Manado itself, 95 cases (54.9%), whereas from other islands were 10 (5.78%) .

Late cases were 29 (16.8%), most from GP with 20 cases (68.96%). but all 3 cases from traditional attendants were late, $x^2=15,322(p=0,004)$

Most of the late cases came from Manado 14 cases (48.28%). Late cases from other islands were only 3 cases (10.34%), but 30% cases from other islands were late, $x^2=3,419(p=0,418)$

The most frequent management of labor were Cesarean Section, 103 cases (59.5%), but 57 cases (32,9%) with spontaneus delivery, $x^2=9,403(p=0,052)$

Most mortality cases (mother or baby) came from GP with 10 cases (71,4%) but 66,6% cases from traditional attendants were death, $x^2=14,190(p=0,0008)$

By location, 7 mortality cases (50%) came from Manado, whereas the biggest proportion was come from other islands with 3 mortality cases from total 7 cases (42,9%), $x^2=6,966(p=0,031)$

Conclusion :

Late cases have significant correlation with the sender , but not with the primary location. Mortality cases have significant correlation with the sender and also the primary location.

Keywords : *referral, pregnancy, maternal- neonatal outcome*

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INTRODUCTION

Pregnancy and delivery are known to be behind the death of more than 500.000 women every year in the world. Most of them occur in third world countries, poor countries and in developing countries. The maternal mortality ratio (MMR) is one of the indicators describing the quality of obstetrical care in a country. A high MMR indicates poor obstetrical care. In Indonesia, the rate of maternal mortality based on the Indonesian Health Department Survey 2007 is 228 per 100.000 live births, still far above the developed countries which MMR is lower than 10 per 100.000 live births. [1]

Maternal mortality is often the result of *High Risk Pregnancy* (HRP), a pregnancy that has more risk (to the mother and to the baby) to develop complications, even death, and it can occur before or after the delivery. This can be caused by maternal factors, the child or whether or not there is an underlying disease. [2,3]

The high number of deaths caused by high risk pregnancies can be lowered by increasing the quality of maternal care, especially in pregnant women, through the *Risk Approach Strategy (RAS)* as an operational strategy where mothers are divided into two groups, low risk pregnancy and high risk pregnancy. The risks can be measured based on criteria (whether or not there is a risk factor) or by the risk factor scoring system. [3]

The higher the number of risks or score, the more it can predict the result, although it is not an absolute factor. Timing and persistency in dealing with high risk pregnancy are important for the outcome. These are also affected by a number of factors including men and medical facilities, as well as non medical factors like geographical factors, transportation, education, and socioeconomic factors.

MATERIAL AND METHOD

This is a retrospective analytic research using a correlation study between the risks factor of HRP and its outcome.

The subjects are all the pregnant women that underwent delivery in the Prof. Dr. R. D. Kandou General Hospital Manado in the period of January 1, 2007-December 31, 2007.

The cases of high risk pregnancy are identified by the Poedji Rochjati critera. These criteria are: young prim gravidity, old prim gravidity, secondary old prim gravidity, age ≥ 35 years old, ≤ 145 cm of body height, grand multi parity, bad obstetric history (BOH), history of cesarean section, pre-ecclampsia & ecclampsia, post mature

pregnancy, presentation anomalies, twin pregnancy, and other underlying medical abnormalities. The cases are then divided into groups of single factor risk, combination of 2 HRP risks, combination of 3 HRP risks and combination of ≥ 4 HRP risks. Factors that correlate with the outcome are the maternal mortality rate, the outcome of the newborn baby, congenital abnormalities and types of delivery.

Data are obtained from the medical records of the Obstetric and Gynecology Department Prof. Dr. R. D. Kandou General Hospital Manado and are analyzed using the SPSS 15 program, using x^2 correlation test and Spearman coefficient correlation rho.

RESULTS

Of the 3375 pregnant women registered in the Obstetrics and Gynecology Department, based on the Rochjati criteria, there were 1524 (45,16%) high risk pregnancies.

The most common risk factor found was pregnant women with age ≥ 35 years old in 686 cases (45,01%) out of all HRP. The most uncommon risk factor was the young primigravidity with 14 cases (0,92%) (Table 1).

Table 1. High Risk Pregnancy Distribution

HRP Risk Factors	N	Percentage (%)
Young primigravidity	14	0.92
Old primigravidity	60	3.94
Secondary old primigravidity	33	2.16
Age ≥ 35 years	686	45.01
Height ≤ 145 cm	317	20.8
Grand multi parity	70	4.59
Bad obstetric history	80	5.25
History of section caesarean	182	11.94
Pre-ecclampsia	134	8.79
Post term pregnancy	141	9.25
Ante partum hemorrhage	33	2.16
Presentation anomalies		
- Breech presentation	188	12.34
- Transverse lie	69	4.53
Medical anomalies	52	3.41
Other risk factors	319	20.93

Single risk factor was most commonly found in 908 cases (59,6%) and the least common group was the combination of ≥ 4 risk factors in 44 cases (2,9%) (Table 2).

Table 2. High Risk Pregnancy Distribution Based on Number of Risk Factors.

HRP Risk Factors	n	Percentage	Death
Single Risk factor	908	59.6	1
Combination of 2 risk factors	432	28.3	0
Combination of 3 risk factors	14	9.2	0
Combination of ≥ 4 risk factors	44	2.9	2
TOTAL	1524	100	3

$$r_s = 0,045 \ (p = 0,039)$$

There were 3 maternal deaths out of all 1524 cases of HRP (0,19%) (Table 3). The result of Spearman correlation coefficient was $r_s = 0,045$ with $p = 0,039$. Thus, there is a statistically significant correlation between the risk factors f HRP and the maternal mortality ($p<0,05$).

Out of all the HRP cases, based on the outcome of babies after deliveries, there were 67 neonatal death (4,39%), 310 babies with asphyxias (20,34%), and 1147 healthy babies (75,26%). There were also 11 babies with congenital anomalies found. Of these 11 babies, 9 were found in the group with a single risk factor and two cases were found in the combination of 2 risk factors (Table 3 and 4).

Table 3. Correlation between the number of HRP risk factors and the baby's outcome

HRP Risk Factors	Baby's outcome after delivery			Total
	Healthy baby	Asphyxia	Death	
Single Risk factor	728	150	30	908
Combination of 2 risk factors	301	102	29	432
Combination of 3 risk factors	87	47	6	140
Combination of ≥ 4 risk factors	31	11	2	44
TOTAL	1147	310	67	1524

$$X^2 = 37.092 \ (P < 0.001)$$

Table 4. Correlation between the number of HRP risk factors and congenital anomalies

HRP Risk Factors	Congenital Defect		Total
	Yes	No	
Single Risk factor	9	899	908
Combination of 2 risk factors	2	430	432
Combination of 3 risk factors	0	140	140
Combination of ≥ 4 risk factors	0	44	44
TOTAL	11	1513	1524

$$r_s = 0.041 \ (p = 0.053)$$

The correlation between the number of HRP risk factors and the outcome of the babies after deliveries had a statistically significant correlation ($p < 0,05$). No statistically significant correlation was found between the number of HRP risk factors and the number of congenital anomalies ($p> 0,05$).

Table 5. Correlation between the number of HRP risk factors and the type of delivery.

HRP Risk Factors	Delivery type			Total
	Spontaneous delivery	Assisted delivery	SC	
Single Risk factor	537	46	325	908
Combination of 2 risk factors	129	23	280	432
Combination of 3 risk factors	15	2	123	140
Combination of ≥ 4 risk factors	0	0	44	44
TOTAL	681	71	772	1524

Based on the table above, the most common type of delivery was by Cesarean Section, found in 772 cases (50,6%) followed by spontaneous deliveries in 681 cases (44,7%) and assisted deliveries in 71 cases (4,65%).

DISCUSSION

In this study, from January 1 to December 31 2007, there were 1524 cases of HRP (45,16%) out of all 3375 deliveries at the Prof. Dr. R. D. Kandou Manado that met the criteria of Rochjati. In the similar study that took place in 1992, there were 1069 cases of HRP (39,10%) out of all 2734 deliveries.[4] This increase can be the result of earlier detection & a better referral system.

As a central hospital, Prof. Dr. R. D. Kandou had been receiving referral cases from outside the island and the province, and often cases with delayed transportation.

The number of high risk pregnancies that had not been able to reach health services or referral centers is unknown. The Health Department data shows that the range of deliveries performed by health personnel in Indonesia is approximately 57,78% to 95,06% (depending on the province or the area), in which other than midwives & doctors, traditional midwives also plays important role in the rural areas. Deliveries performed in homes of villagers are approximately 60-80%.[1]

The frequency of HRP also depends on many things like risk factors that were judged by criteria or with the scoring system. This causes the varieties in numbers.[3]

Out of all the HRP cases, the most common risk factor found was the maternal age ≥ 35 years old (Table 1), which was found in 686 cases (45,01%). In the previous Wantania[4] study, the most common risk factor found was also the maternal age ≥ 35 years old (22,45%), a smaller percentage. This shows that there were increased numbers of pregnancies and deliveries that occur in the age of more than 35 years old as one of the risk factor.

The age of 35 years old was correlated with a number of pre term spontaneous deliveries and stillbirth and also other complicating factors. Those factors were also included in the categories of 4 "too" that often became problems in Indonesia: "too old", "too young", "too many children", "too close with the last delivery".[3,5,6]

After those cases were divided according to the number of risk factors in every case (Table 2), then the most number of risk factors are cases with a single risk factor in 908 cases (59,5%), followed by combination of 2 factors in 432 risks (28,3%), combination of 3 factors in 140 cases (9,3%), and combination of ≥ 4 factors in 44 cases (2,9%).

Based on the criteria, every risk factor has the same value. Rochjati also created a scoring system of risk factors using different values for each risk factor: 2, 4, and 8. High risk pregnancy was determined if the total score was 6-10, and very high risk pregnancy was determined if the score was 12. Thus, when using a scoring system, the number of cases that were included in the high risk pregnancy will decrease. [3]

In 1524 cases of HRP, there were 3 cases of maternal mortality (table 2), which were found in a single risk factor case with a mother of sever pre-ecclampsia, death with the combination of ≥ 4 risk factors was first found in the mother with the age of ≥ 35 years old, pre-ecclampsia, breech presentation, and prim secondary pregnancy with underlying medical abnormality. On the other hand, the death caused by the second combination of ≥ 4 risk factors was found in the mother with the age of ≥ 35 years old, height ≤ 145 cm, pre-ecclampsia, and breech presentation. The number of risks factors in HRP had shown a significant correlation statistically with maternal mortality (p <0,05).

The patterns of high risk pregnancies reported by the WHO, that mostly caused maternal mortality were: hypertension in pregnancy (14,9%), induced abortion (6,7%), hemorrhage (6,2%), anemia (4,5%), placenta abnormality (4,1%). In these three death case all were accompanied with pre-ecclampsia, although throughout Indonesia, cases of hemorrhage were the cause of 28% maternal deaths, followed by ecclampsia 24% and infection 11%. These were also found in other countries, like in the research of Begum[7] at the tertiary care hospital. Hemorrhage and infection were also common in the first early trimester after a provocative abortion.

Taguchi, et al[8] found that a lower social economic status and the availability of antenatal care had a significant role in the maternal mortality in Surabaya Indonesia. According to Graham WJ, et al [9] the risk of maternal mortality in Indonesia was 3-4 times higher in the lower social economic group.

The outcome of the newborn baby distribution can be seen in Table 3. Whereas the neonatal intra partum deaths were in 67 cases (4,39% out of all HRP cases). Mostly came from the single risk cases (44,7%), with details as followed:

The maternal age ≥ 35 years old   : 12 cases

Height ≤ 145 cm   : 3 cases

History of previous cesarean section : 2 cases

Pre-ecclampsia   : 1 case

Post term pregnancy   : 1 case

Ante partum hemorrhage   : 1 case

Mal position of the fetus   : 8 cases

Other risk factors   : 2 cases

In this study, the number of intra partum deaths was lower than the previous study by Wantania[4] , 6,45% out of all the HRP cases. This number was lower than the per natal death number, because it was assessed only after delivery. On the other hand, there was a significant correlation between the number of risk factors and neonatal deaths (p < 0,05).

In the study of neonatal mortality in Indonesia, according to Titaley CR, et al[10] , neonatal death was associated with lower birth weight, short interval of deliveries, availability of per natal care facilities, including the assistance of trained medical professionals and the post natal care.

From the Netherlands, Ravelli AC, et al also described that the mother's age (< 20 years & > 40 years old) and ≥ 4 parity (similar to the 4 T problems in Indonesia) were also risk factors of per natal mortality, with a lower prevalence (< 3%). Early preterm contributed to becoming the most common cause of per natal death by 29%. [11]

Zareen, et al [12] found that the perinatal mortality was twice as high in the high risk pregnancy group compared to the low risk group, though the neonatal complications were not statistically significant in both groups.

Congenital abnormalities were found in this study in 11 cases (0,72%), table 4. Another study in Manado found 1,03% cases.[4]

According to the Yale Medical Group chances of developing congenital abnormalities were approximately 3-4%, mostly due to unknown causes.[13] In this study, the number was lower. This could be caused by unknown/undiagnosed congenital abnormalities because of the lack of facilities.

The most congenital abnormalities were found in the single risk factor group in 9 cases (81,8%), followed by the combination of 2 risk factors in 2 cases (18,2%) with details as follows

Single Risk Factor

The maternal age ≥ 35 years old   : 3 cases
Height ≤ 145 cm   : 1 case
Post term pregnancy   : 2 cases
Mal position of the fetus   : 3 cases

Combination of 2 Risk Factors
- The maternal age ≥ 35 years old with fetal mal position
- History of previous cesarean section with other risk factors

The types of congenital abnormalities are as follows:
Anencephaly   : 3 cases
Labial schisms   : 3 cases
Achondroplasia   : 1 case
CTEV   : 1 case
Hydrocephalus   : 1 case

| Hydrocephalus + omphalocele + bifida spine | : 1 case |
| Hydrocephalus + labial palatal schisms | : 1 case |

The most common type of delivery in high risk pregnancies was by cesarean section found in 772 cases (50,6%) followed by spontaneous deliveries in 681 cases (44,7%) and assisted deliveries in 71 cases (4,65%).

Out of all deliveries, the percentage of cesarean section deliveries was increase. This number increased compared to the previous study in the 90s, with the number of cesarean section only at 16,3%. This increase was associated with the number of repeated cesarean section.

The role of Primary Health Care as the first basic health care, and of the hospital as the Secondary Health Care are important to recognize and detect high risk pregnancies, to prevent complications, and to prevent death caused by complications.

The study of Frakenberg, et al[14] showed that the midwives program was the closest facility available to the villagers with lower education status. This played an important role in antenatal care. It can be seen in 90% of deliveries that occurred outside hospitals, 64% in patients home, and 28% in the home of midwives.[15]

Based on those factors, an integrated referral planned system and plenary is absolutely needed. Other than that, the problems of delay in early detection, delay in referring and delay of assessment, that are caused by geographical factors, social cultural, and social economic factors must be given special attention. In some places of Indonesia transportation to the nearest health care is limited.[16]

CONCLUSION

The frequency of HRP cases at Prof. Dr. R. D. Kandou Manado in the period of January 1 until December 31 2007 is 45,16%.

The risk factor mostly found is the maternal age $\geq$ 35 years old, which was found in 686 cases (45,01%) out of all HRP cases.

In this study, most of the HRP cases are correlated with the outcome:

- There is a significant correlation between the number of risk factors in HRP cases with the outcome of the mothers/maternal mortalities.

- There is a significant correlation between the number of risk factors in HRP cases with the outcome of the newborn.

- There is no significant correlation between the number of risk factors in HRP with the number of congenital abnormalities.

SUGGESTION

It is important to identify the risk factors during physical examination or taking the patient's history. Thus, it is important to give counseling to the community about risk factors and about the safe age of reproduction.

Good assessments of HRP cases are also needed.

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