Research Report

Review of Preterm Labour Cases at Dr. Cipto Mangunkusumo Hospital January – December 2009

Kajian Kasus-Kasus Persalinan Preterm di Instalasi Gawat Darurat Lantai Tiga RSUPN Dr. Cipto Mangunkusumo Periode Januari - Desember 2009

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Abstract

Objective: To describe and to evaluate preterm labour cases and management at obstetric emergency room of Dr. Cipto Mangunkusumo Hospital (RSCM) from January until December 2009.

Method: This is a cross-sectional study with 202 secondary data samples from stratified random sampling performed to all preterm labour cases at obstetric emergency room of RSCM from January until December 2009. The data were processed for frequencies and bivariate analysis, and then further analyzed with multivariate analysis.

Result: Most of the patient's age were between 17 to 35 years old (82.7%). Most of them belonged to preterm group or gestational age between 32 weeks to less than 37 weeks (69.8%). Fifty three percent of the preterm labour was caused by premature rupture of the membrane. About 47% of the babies had perinatal morbidity and the most morbidity cases was respiratory distress with septic condition (47.7%). Perinatal mortality only happened to 5.9% babies. From bivariate analysis, low socioeconomic level (p = 0.032), gestational age (extreme preterm p = 0.000, very preterm p = 0.000), APGAR Score minute 1 < 7 (p = 0.000), APGAR Score minute 5 < 7 (p = 0.000) and preterm baby status (Small for Gestational Age p = 0.048) were the variable which influenced the perinatal morbidity in our hospital. Perinatal mortality was influenced by low socioeconomic level (p = 0.048), gestational age (extreme preterm p = 0.000, very preterm p = 0.063), APGAR Score minute 1 < 7 (p = 0.000), APGAR Score minute 5 < 7 (p = 0.000) and also morbidity of the preterm baby (p = 0.000). In this study, we found there was significant relation between cases of membrane rupture and perinatal sepsis (p = 0.000; RR 5.98; 95% CI 2.72 - 13.39) but there was no significant relation between cases with or without membrane rupture compared to active or expectant management to the perinatal morbidity and mortality. From multivariate analysis, APGAR score minute 5 < 7 had the greatest influence to the perinatal morbidity and preterm baby morbidity had the greatest influence to perinatal mortality.

Conclusion: Perinatal morbidity and mortality caused by preterm labour in Dr. Cipto Mangunkusumo Hospital were influenced by several factors which are socioeconomic status, APGAR score, preterm baby status and also morbidity of the baby. Therefore we need to do comprehensive prevention in biologic and socioeconomic condition of the patients. Expectant management in preterm labour cases should be made on many consideration since expectant management was proven had no correlation with good perinatal morbidity and mortality outcome.

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Keywords: preterm labour, risk factor, perinatal morbidity, perinatal mortality

Abstrak

***Tujuan**: Mendapatkan gambaran dan melakukan kajian kasus-kasus persalinan preterm yang ditatalaksana di IGD Lantai III RSCM dari Januari hingga Desember 2009.*

***Metode**: Penelitian ini merupakan studi potong lintang dengan menggunakan 202 sampel data sekunder yang diambil secara stratified random sampling dari seluruh kasus persalinan preterm yang ditatalaksana di IGD Lantai III RSCM dari Januari hingga Desember 2009. Data diolah secara univariat, bivariat, maupun multivariat.*

***Hasil**: Pasien terbanyak berusia antara 17 - 35 tahun (82,7%). Sebagian besar pasien termasuk dalam kategori preterm atau usia gestasi mulai 32 minggu sampai < 37 minggu yaitu sebesar 69,8%. Ketuban pecah merupakan penyebab persalinan preterm terbanyak yaitu sebesar 53%. Sebanyak 47% bayi yang lahir mengalami morbiditas dan morbiditas perinatal terbanyak (47,4%) adalah distress pernapasan disertai sepsis Namun bayi yang mengalami mortalitas perinatal hanya 5,9%. Dari hasil analisis bivariat, tingkat sosioekonomi rendah (p = 0,032), usia gestasi (ekstrim preterm p = 0,000; sangat preterm p = 0,000), nilai APGAR menit 1 < 7 (p = 0,000), nilai APGAR menit 5 < 7 (p = 0,000) dan status bayi persalinan preterm KMK (p = 0,048) adalah variabel yang dianggap berpengaruh pada morbiditas perinatal. Variabel yang dianggap berpengaruh pada mortalitas perinatal adalah tingkat sosioekonomi rendah (p = 0,048), usia gestasi (ekstrim preterm p = 0,000; sangat preterm p = 0,063), nilai APGAR menit 1 < 7 (p = 0,000), nilai APGAR menit 5 < 7 (p = 0,000) dan morbiditas bayi preterm (p = 0.000). Pada penelitian ini didapatkan hubungan yang bermakna antara ketuban pecah dengan morbiditas sepsis (p = 0,000) sedangkan pada kasus ketuban pecah dan non ketuban pecah yang ditatalaksana secara ekspektatif maupun aktif tidak didapatkan hubungan yang bermakna terhadap morbiditas dan mortalitas perinatal bayi yang dilahirkan. Pada analisis multivariat diketahui bahwa nilai APGAR menit 5 < 7 adalah faktor yang paling berpengaruh terhadap morbiditas perinatal sedangkan morbiditas bayi preterm adalah faktor yang paling berpengaruh terhadap mortalitas perinatal.*

***Kesimpulan**: Morbiditas dan mortalitas perinatal pada persalinan preterm di RSCM dipengaruhi oleh beberapa faktor antara lain tingkat sosioekonomi, nilai APGAR, status bayi preterm dan morbiditas perinatal sehingga perlu dilakukan upaya-upaya pencegahan yang komprehensif baik dari segi biologis maupun sosioekonomi. Keputusan tatalaksana ekspektatif kasus ancaman persalinan preterm baik ketuban pecah maupun non ketuban pecah memerlukan pertimbangan lebih lanjut karena tatalaksana ekspektatif terbukti tidak bermakna menurunkan risiko morbiditas dan mortalitas perinatal di RSCM.*

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***Kata kunci**: persalinan preterm, faktor risiko, morbiditas perinatal, mortalitas perinatal*

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INTRODUCTION

According to the World Health Organization, preterm labour is labour that occurs at the age of less than 37 weeks of pregnancy and childbirth occurring more than 20 weeks.[1] Preterm labour can increase the rate of perinatal mortality by 65%. Generally this is related to low birth weight babies.[2] Preterm delivery remains a major cause of morbidity and mortality of infants without congenital abnormalities in industrialized countries. Birth at preterm gestational age was only 1 - 2% of all deliveries, but has a long-term neurologic morbidity of approximately 50% and perinatal mortality of about 60%.[1,2] The proportion of the perinatal causes death in the RSU, RSIA, and RSB in Indonesia in 2003 are: low birth weight infant: 25.5%, asphyxia 18.5%, upper respiratory tract infection (URTI) 0.7%, diarrhea 0.8%, tetanus neonatorum 0.5%, ear disorder 2.5%, trauma during labour 2.3%, and others 49.2%.[3]

Various medical risk factors are suggested as the cause of preterm labour such as: placental abruption, multifetal gestation, abnormality of uterus, polyhidramnios, fetal congenital abnormality, premature rupture of the membrane, intra uterine infection and others. Socio-economic risk factors also play role in the occurrence of preterm labour, which constitute of demographic factor, behavioral factor and obstetrical history such as previous history of preterm labour. Demographic factor which pose risk for preterm labour include coloured race, extreme maternal age (< 17 years or > 35 years), low socioeconomic status, low prepregnancy weight.[4] Prevention efforts can be done to reduce the number of preterm labour and neonatal morbidity and mortality include primary prevention, secondary and tertiary. Problems in the effort to cope with preterm labour have not shown satisfactory results. This is because preterm labour is not a disease but an incident with a single cause or multiple, independent or interdependent. Preterm labour is often the end result of a multifactorial process.[5] Dr. Cipto Mangunkusumo Hospital is a national referral hospital centre which handle many cases including the cases of preterm labour and its complication, however sufficient data regarding preterm labour cases, outcome and the result of its management is not provided adequately, so we need a study to determine the output of preterm delivery and expected to give advice in an effort to develop a referral system of preterm labour cases.

METHOD

This study is a descriptive analytic study with cross sectional design, using secondary data from 202 medical record of preterm labours that are treated in emergency room, at 3rd floor RSCM from January until December 2009 taken by the stratified random sampling. Exclusion criteria include preterm labours with infants suffering from congenital abnormality or intra uterine fetal death (IUFD). The data were processed for frequencies and bivariate analysis, and then further analyzed with multivariate analysis.

RESULT

From the Activity Report of Emergency Room 3rd Floor Dr. Cipto Mangunkusumo Hospital 2009, 3234 cases of delivery were obtained, of all those cases, 673 deliveries (21%) were categorized as preterm labour. The characteristic of host, environment, causative agent and infant of preterm labour from 202 samples are shown in Table 1.

Table 1. Subjects distribution of preterm labour by the characteristic of host and environment in Emergency Room 3rd Floor RSCM, January - December 2009.

Characteristic	n	%
Maternal age		
• < 17 years	2	1.0
• 17 - 35 years	167	82.7
• 35 + years	33	16.3
Education		
• Elementary school	50	24.8
• Junior high school	42	20.8
• Senior high school	90	44.6
• Bachelor	20	9.8
Funding		
• GAKIN	35	17.3
• SKTM	69	34.2
• ASKES	5	2.5
• General	93	46.0
Gestational Age		
• Extreme preterm (24 - 27 weeks)	15	7.4
• Very preterm (28 - 31 weeks)	46	22.8
• Preterm (32 - < 37 weeks)	141	69.8
History of preterm labour		
• Yes	41	20.3
• No	161	79.7
Antenatal care examiner		
• Midwife	172	85.1
• Obstetrician	28	13.9
• None	2	1.0
Quantity of antenatal care		
• None	2	1.0
• < 4 times	36	17.8
• 4 + times	164	81.2
Treatment		
• Expectant	72	35.6
• Active	130	64.4
Mode of delivery		
• Spontaneous	88	43.6
• Forceps extraction	3	1.5
• SC	111	55.0

Based on the host characteristic it was known that the majority of patient's age is 17 - 35 (82.7%) and patients with low level of education (from elementary to junior high school) were in equal proportion with patients with high level of education (high school and bachelor) which is 45.6% and 46% respectively. Pa-

tients who were at the low level of social economic status (funding by GAKIN and SKTM) constituted 51.5% of sample. Most patients were categorized as preterm (gestational age of 32 - < 37 weeks), which is 69.8% of total sample and only minority of patients, have the history of preterm labour constituted 20.3% of sample.

From the history of antenatal care it is known that most patients does the antenatal care attended by midwives which constitute 85.1% of sample with the quantity of antenatal care during pregnancy of more than 4 times constitute 81.2% of patients. In all preterm labour treated in emergency room 3rd floor, it is known that only 35.6% underwent expectant management and infant delivered by spontaneous method are almost at the same proportion with those delivered by Caesarean section which is 43.6%.

From this study, it was also known that most of preterm labour cases at the emergency room 3rd floor Dr. Cipto Mangunkusumo Hospital (RSCM) was caused by premature rupture of the membrane which is 53%, followed by severe preeclampsia which was 26.7%, then followed by multiple birth which constituted 15.3% of sample.

Table 2. Characteristic of preterm infant born at emergency room 3rd floor from January to December 2009.

Outcome of preterm labour	n	%
First minute APGAR score		
• < 7	48	23.8
• 7 +	154	76.2
Fifth minute APGAR score		
• < 7	16	7.9
• 7 +	186	92.1
Status of preterm infant		
• Small for gestational age	10	5.0
• Appropriate for gestational age	192	95.0

Based on the APGAR score, it was known that most of the infants were born with 1st minute APGAR and 5th minute APGAR score of more than 7, which is 63.9% and 84.2% and only 5% were small for gestational age.

Table 3. Distribution of preterm infant by perinatal morbidity at emergency room 3rd floor from January to December 2009 (n = 202)

Type of perinatal morbidity	n (%)	n	%
With morbidity		95	47.0
Respiratory distress			
• Respiratory distress only	31 (32.6)		
• Respiratory distress and sepsis	45 (47.4)		
• Respiratory distress and others	1 (1.1)		
Sepsis			
• Sepsis only	13 (13.6)		
Lain-lain			
• Others only	5 (5.3)		
No morbidity		107	53.0
Total		202	100.0

Based on the type of morbidity, it was known that 47% infant suffered perinatal morbidity, and 47.4% of those suffered from respiratory distress and sepsis, however, only 5.9% infants were died.

From bivariate analysis low social economic (p = 0.032), gestational age (extreme preterm p = 0.000; very preterm p = 0.000), 1st minute APGAR score < 7 (p = 0.000), 5th minute APGAR score < 7 (p = 0.000) and small for gestational age (p = 0.048) were variables which influence the perinatal morbidity of infant of preterm labour at emergency room 3rd floor from January until December 2009. Variables considered to have influence in the perinatal mortality were low social economic level (p = 0.048), gestational age (extreme preterm p = 0.000, very preterm p = 0.063), 1st minute APGAR score < 7 (p = 0.000), 5th minute APGAR score < 7 (p = 0.000) and preterm infant with morbidity (p = 0.000).

In this study, a significant correlation between the cause of preterm labour due to premature rupture of membrane and perinatal sepsis morbidity (p = 0.000) was found. Treatment for ruptured membrane cases and non-ruptured membrane by expectant management or active method did not show any significant correlation with perinatal morbidity or mortality. In multivariate analysis, it is known that 5th minute APGAR score < 7 was a factor that has biggest influence to the perinatal morbidity (RR = ~; 95 CI ~ - ~), and morbidity of preterm infant was the factor that has biggest influence to the perinatal mortality (RR = ~; 95 CI ~ - ~).

DISCUSSION

This study is a descriptive analytic study that can be used as a basis for further researches. Till now Dr. Cipto Mangunkusumo Hospital has not got any specific recording system regarding preterm labour cases which are treated at the facility. The design of the research is cross sectional using secondary data. This study also has high bias tendency because the numerous and complex factor related to perinatal morbidity and mortality.

Of all deliveries in Dr. Cipto Mangunkusumo Hospital, 21% were categorized as preterm labour. In other studies done in several hospitals in Jakarta in 1993, the number of preterm labour that occurred were almost equal which is 20.4%, however in a study done in UNIKA Atma Jaya hospital in 2008 the preterm labour cases were only 8.9%.[6,7] The incidence of preterm labour in industrialize country such as United State of America is about 11% and in Europe the prevalence are vary from 5 to 7%, however in Singapore the prevalence of preterm labour is only 3.6%.[8,9] Many factors might influence the high incidence of preterm labour cases in Dr. Cipto Mangunkusumo Hospital, one of the reason because Dr. Cipto Mangunkusumo Hospital is a type A hospital which is also a top referral hospital.

Based on the host characteristic, it was known that the majority of preterm labour patients coming to emergency room 3rd floor in 2009 aged 17 to 35 years (82.7%). In a study done in Nigeria the number was nearly the same, the prevalence of patient with preterm labour aged 20 to 34 years is 74%, and only

8.7% are aged < 20 years. Patients aged 17 years to 35 years are the majority because these age are categorized as reproductive age with high number of delivery.[9]

Preterm labour patients in emergency room 3rd floor whose education was categorized as high (high school and bachelor) constituted 45.6% of samples. Patient with high education apparently was at the same proportion with those whose education was low.

The amount of patient with low social economic status (funding by GAKIN/SKTM) who were admitted to emergency room 3rd floor were 51.5%, and patients with high social economic status (funding by ASKES/general) were 48.5%. Both groups had almost equal proportion. This condition were also found in the study done in Nigeria, preterm labour patients with low social economic status were 56,2% and patients with high social economic status were 43,8%.[9]

Most patients who were admitted to emergency room 3rd floor were categorized as preterm (gestational age 32 weeks - < 37 weeks), which were 69.8%. Most preterm labours in industrialized countries that occurred fall to the preterm category and are supported with excellent perinatal care thus the survival rate is high. Distribution data of preterm labour patients in America in 2004 shows that preterm labour that occurs from the age of 32 to 36 weeks of gestational age is 83.9%, with 34 until 36 weeks of gestational age at the highest proportion.[10]

In this study, only 20.3% patients had the history of previous preterm labour. Similar result is attained in a study in Parkland Hospital America 2001. From that study it was known that among preterm labour patients, only 10% of patients had previous history of preterm labour. Thus, previous history of preterm labour can not be used as predictor factor in Parkland Hospital.[10]

The analysis of correlation between perinatal morbidity and mortality, showed that there was no significant correlation between maternal age > 35 years and perinatal morbidity and mortality, however analysis could not be done to the maternal age < 17 years group because the sample size was too small.

In literatures it is stated that low level of education would limit the access of a pregnant woman in obtaining health care, thus preterm labour could not be detected earlier. In this study, mother's level of education did not have any significant correlation with perinatal morbidity and mortality. Data in United State of America shows a decline in preterm labour as the mother's educational level increases.[11] Dr. Cipto Mangunkusumo General Hospital is a type A hospital and a national referral centre so the patients who were admitted to the hospital have almost equal degree of illness severity which was not influenced by level of education.

It was known that most patient (85.1%), visited midwives for antenatal care. More than 4 times antenatal visit during pregnancy was done by 81.2% patients. From the Basic Health Research report (Riset Kesehatan Dasar/Riskesdas) Indonesia 2010 similar result is obtained, which is 83.8% pregnant mothers visited health care provider for antenatal care and there were still mother who did not attend antenatal care, which is 3% of total research population. Most antenatal care is attended by midwives (71.4%).[12]

Access coverage for pregnant mother with antenatal care visit pattern one time during the first and second trimester, twice in the third trimester (1-1-2) by health care provider is 61.4%, this value is much lower compared with value that is obtained in this study which is antenatal visit during pregnancy of more than 4 times or more reached 81.2%.[12] Based on statistical analysis no significant correlation between the amount of antenatal visit and the examiner of antenatal care with perinatal mortality and morbidity. This result is caused by several factors such as antenatal care guide in Indonesia has not included effort to prevent and treat preterm labour. Most of the efforts that has been done are tertiary such as administration of antibiotic, corticosteroids, and tocolytic agents. In a study done regarding antenatal care component, it is known that antenatal care in Europe focuses on primary prevention during pregnancy, which is giving social and financial support to all pregnant mothers. This approach has successfully decreased the number of preterm labour in France. Thus organizing a comprehensive antenatal care guideline that includes primary intervention (targeted to all women of reproductive age), secondary intervention (to eliminate or reduce existing risks) and tertiary intervention (to increase the outcome of preterm infant) is necessary.

Of all preterm labour cases treated at emergency room 3rd floor , it was known that only 35.6% cases were having expectant management and the rest were having active management. Expectant management used tocolytic to lengthen the period of pregnancy of a mother who are at risk of acute preterm labour caused mainly by active preterm labour or ruptured of the membrane. Most study stated that tocolytic agent might improve the outcome of neonate because of its correlation with steroid administration.[13]

More than half (55%) infants of preterm labour in emergency room of third floor Dr. Cipto Mangunkusumo General Hospital were delivered with caesarean section method. In statistical analysis it was known that the method of delivery was not significant in increasing the risk of perinatal morbidity and mortality. A study in India shows the number of neonate mortality in the infant of preterm labour delivered with caesarean section is around 20% and those who are delivered vaginally has mortality rate around 10%.[14]

From this research it was known that most of preterm labour cases treated in emergency room 3rd floor Dr. Cipto Mangunkusumo General Hospital were caused by premature rupture of membrane, which is 53%. Premature rupture of membrane occurs in 53% pregnancy and one third of preterm labour was caused by PPROM. Premature rupture of membrane is an important cause of perinatal morbidity and mortality because it is correlated with short period between ruptured membrane and the beginning of labour, perinatal infection and compression of umbilical cord due to oligohydramnios. In this research significant correlation between ruptured membrane and mortality was found ($p = 0.061$).

APGAR score is a measurement of newborn infant vitality based on heart rate, respiration, colour, muscle tone and irritability.[15] Based on APGAR score in infant of preterm labour in emergency room 3rd floor,

it was known that most newborn infant born with 1st minute APGAR score and 5th minute APGAR score of more than 7, which is 76.2% and 92.1%. In statistical analysis it was known that 1st minute and 5th minute APGAR score have a significant correlation with perinatal mortality and morbidity (value of p = 0.000 for both). In a study done in Australia it is known that newborn infant with low 1st minute and 5th minute APGAR score have a close relationship with perinatal morbidity.[16] A study done in Sweden proved that infant born with low 5th minute APGAR score (< 7) correlated with increasing risk of mortality and sever neurologic morbidity such as cerebral palsy.[15,17]

In this research only 5% of infant were categorized as small for gestational age, however it was statistically significant in increasing the perinatal morbidity and mortality (p = 0.048). This result was in accordance with literature, which stated that small for gestational is correlated with all perinatal morbidity and mortality marker.[18]

Based on the type of morbidity, it was known that 47% infant suffered from perinatal morbidity, and 47.4% of those suffered from respiratory distress and sepsis. Preterm infants are at risk to suffer from disease correlated with immaturity of various organ system. Special attention were given to preterm labour with gestational age < 32 weeks. Labour that occurred in that group of age constitute only 1 - 2% of all delivery. Based on literature, it is known that 50% neurologic morbidity and 60% mortality occurred in that group of gestational age.[11] In this study it is known that only 5.9% infant suffered from perinatal mortality. A study in America showed that the number of perinatal mortality at the gestational age of 33 until < 37 weeks is around 0.5 - 1.5%. The high perinatal mortality rate in RSCM can be caused by several factors because that number is not compared with gestational age or birth weight thus unspecific. Thus, a study to further identify the specific number of mortality and morbidity by gestational age and birth weight in infant of preterm labour infant in Dr. Cipto Mangunkusumo General Hospital is needed. In statistical analysis it was known that infant of preterm labour who suffered from morbidity were at risk of mortality (RR = 28.13).

Based on the result of this study, it could be concluded that there were no significant difference between the newborn infant outcome of preterm labour who were treated with expectant or active management with perinatal morbidity and mortality in the case of ruptured membrane or non-ruptured membrane cases. Thus, expectant management in preterm labour cases should be made on many consideration.

From analysis it was found that variable which influenced the perinatal morbidity were low social economy status (Gakin/SKTM), 1st minute and 5th minute APGAR score < 7. Fifth minute APGAR score has an infinite relative risk factor which means almost all infant of preterm labour who were born with 5th minute APGAR score < 7 will almost always suffer from perinatal morbidity. Variable that influenced the mortality rate were low social economic status (Gakin/SK TM), 1st minute APGAR score < 7 and morbidity of the infant. Infant morbidity have infinite relative risk, which means infant of preterm labour who suffer from morbidity at very high risk of perinatal mortality. In the literature, it was stated that low APGAR score in infant influence the perinatal morbidity and mortality. Until now APGAR score is still considered as a method that is easy to use to score the infants' vitality the moment they are born. Low APGAR score can be caused by several factors which are preterm labour itself due to immature organ system of the infant, the existence of other diseases in the infant or the lack/inadequate ability of delivery attendee in performing resuscitation. One thing that can be intervened is the ability of delivery attendee to perform resuscitation. In a study conducted in Illinois, America regarding the standardization of knowledge and skills of resuscitation through national neonate resuscitation program to all health care personnel who are in charge of delivery room, it was found that the percentage of neonate with low 1st minute APGAR score is significantly reduced and statistically significant in reducing the proportion of high risk infant whose 5th APGAR score is constant or lower.[19]

CONCLUSION

Perinatal morbidity and mortality caused by preterm labour in Dr. Cipto Mangunkusumo Hospital were influenced by several factors which are socioeconomic status, APGAR score, preterm baby status and also morbidity of the baby. Therefore we need to do comprehensive prevention in biologic and socioeconomic condition of the patients. Expectant management in preterm labour cases should be made on many consideration since expectant management was proven had no correlation with good perinatal morbidity and mortality outcome.

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