RISK FACTORS FOR BIRTH ASPHYXIA

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ABSTRAK

Asfiksia adalah masalah serius pada neonatus di seluruh dunia. Kejadian asfiksia lahir 4 juta bayi per tahun. Ada banyak penyebab, antara lain bayi mungkin tidak dapat mengambil oksigen yang cukup sebelum, selama dan setelah melahirkan. Tujuan dari penelitian ini adalah untuk mengidentifikasi faktor-faktor risiko asfiksia neonatorum mode ibu, neonatal dan cara kelahiran. Bahan dan Metode: studi kasus kontrol. Data dikumpulkan secara retrospektif dari rekam medis ibu hamil dan neonatus yang lahir di RS Dr Soetomo antara tanggal 1 Januari 2009 sampai Desember 2009. Dikumpulkan data neonatus (berat lahir, usia kehamilan, skor Apgar) dan data ibu hamil (usia, preeklamsia, perdarahan antepartum, membran pecah prematur dan proses persalinan). Faktor risiko yang berhubungan dengan asfiksia adalah: perdarahan antepartum, p 0,009, OR 2,607 (1,242-5,473), preeklamsia, p 0,000, OR 2,372 (1,688-3,333), prematuritas p 0,000, OR 4,055 (2,939-5,595), post maturitas, p 0,001, OR 3,811 (1,637-8,872), berat lahir rendah, p 0,000, OR 5,833 (4,245-8,016), dan bedah caesar, p 0,000, OR 3,778 (2,750-5,190). Kesimpulannya, faktor risiko asfiksia adalah perdarahan antepartum, preeklamsia, berat lahir rendah, prematuritas, kelahiran lewat waktu dan bedah caesar.

ABSTRACT

Asphyxia is a serious problem in the neonate worldwide. Incidence of birth asphyxia are 4 million baby a year. There are many reasons as baby may be not able to take enough oxygen before, during and after delivery. The objective of this study was to identify the risk factors of neonatal asphyxia from maternal, neonatal and mode of delivery. Materials and Methods: case control study. The data was retrospectively collected from medical record of pregnant women and neonate that was born in Dr Soetomo Hospital between 1 January 2009 to Desember 2009. Data of the inborn neonate (birth weight, gestational age, Apgar score) and the data of pregnant mother (age, preeclampsia, antepartum bleeding, premature rupture of the membrane and mode of delivery) was collected. Risk factors that associated with asphyxia were: antepartum bleeding, p 0.009, OR 2.607 (1.242-5.473), preeclampsia, p 0.000, OR 2.372 (1.688-3.333), prematurity p 0.000, OR 4.055 (2.939-5.595), post mature, p 0.001, OR 3.811 (1.637 – 8.872), low birth weight, p 0.000, OR 5.833 (4.245-8.016), and caesarian section, p 0.000, OR 3.778 (2.750-5.190). In conclusion, risk factor for asphyxia were antepartum bleeding, preeclampsia, low birth weight, prematurity, post date delivery and caesarian section.

Keyword: *risk factor, asphyxia, neonate*

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INTRODUCTION

Asphyxia is a serious problem in the neonate worldwide. Term of perinatal asphyxia, asphyxia neonatorum or hipoxic ischemic encephalopathy (HIE) are often used synonimously but more precisely, the asphyxia refers to disturbed exchange of O2 and CO2, while HIE refers to deprivation of O2 to the brain by combined effect of hypoxemia (decrease oxygen of blood) and ischemia (decreased blood flow) (Azam 2004)

Incidence of birth asphyxia are 4 million baby a year or 2.8% of all neonate which results in death and sequellae. Various conditions can affect the fetus and neonate born with asphyxia. There are many reasons as baby may be not able to take enough oxygen before, during and after delivery. A mother may have medical condition that lowering the oxygen supply to the neonate such as preeclampsia, antepartum bleeding or some medicine; there may be some problem in the placenta such as insuficient placenta that may prevent oxygen to circulating in the fetus; difficulty during delivery process can proceed to the birth asphyxia (Mir 1997; Suwannachat 2004; Majeed 2007). We aimed to identify the risk factors of neonatal asphyxia from maternal, neonatal and mode of delivery

MATERIALS AND METHODS

Study design was case control study. The data was retrospectively collected from medical record of pregnant women and neonate that was born in Dr

Soetomo Hospital between 1 January 2009 to Desember 2009. Data of the inborn neonate (birth weight, gestational age, Apgar score) and the data of pregnant mother (age, preeclampsia,antepartum bleeding, premature rupture of the membrane and mode of delivery) was collected. The sample was grouped in the asphyxia neonate and non-asphyxia neonate. Inclusion criteria was all neonates that born in Dr. Soetomo hospital. Exclusion criteria was congenital heart disease. Data are presented in distribution tabulation and data analysis was performed with a computer assisted statistical package (SPSS ver. 12.0). Chi square was used to analyze the data. Risk factors were calculated with odds ratio and 95% Confidence Interval, p values less than 0.05 was considered significant.

RESULTS

The collected data from 1 January 2009 until 31 December 2009 have been reviewed from all of medical record of the neonates that was born Dr Soetomo hospital. 2143 of the medical record was studied. 17 patients was excluded because of congenital heart disease. The asphyxia neonate was 178 (8%) cases and the non aphyxia neonate was 1948 cases.

Table 1. Characteristics of patient

	Asphyxia (n=178)	Non-asphyxia (n = 1948)
Mother condition		
- mother age < 18 year	2 (1.1%)	37 (1.9%)
- mother age 18-35 year	152 (85.4%)	1609 (82.6%)
- mother age > 35 year	24 (13.5%)	302 (15.5%)
- antepartum bleeding	9 (5.1%)	39 (2 %)
- PROM	27 (15.2%)	367 (18.8 %)
- Preeclampsia	55 (30.9%)	309 (15.9 %)
Neonate condition		
- premature	81 (45.5%)	348 (17.9%)
- fullterm	90 (50.6%)	1568 (80.5%)
- post date	7 (3.9%)	32 (1.6%)
- low birth weight	100 (56.2%)	351 (18%)
Mode of delivery		
- spontaneous	42 (23.6%)	1160 (59.5%)
- Vaccum extraction	14 (7.9%)	105 (5.4%)
- forceps extraction	3 (1.7%)	32 (1.6%)
- caesarian section	110 (61.8%)	584 (30%)
- Others	9 (5.1%)	66 (3.6%)

In the table 1, the characteristic of maternal condition of asphyxia neonate were antepartum and preeclampsia that more frequent than non asphyxia neonate. Percentage of caesarian section was also more frequent in asphyxia neonate

From the table 2, the significant risk factors of asphyxia neonate were antepartum bleeding, preeclampisa, prematurity, post mature, low birth weight and caesarian section. The higher risk factor was low birth weight

Table 2 Risk factors for asphyxia

Risk factors	P value	OR (95% CI)
Maternal		
- Mother age < 18 years	0.488	0.605 (0.144 – 2.539)
- Mother age > 35 years	0.913	0.974 (0.604 – 1.569)
- PRoM	0.226	0.770 (0.503 – 1.177)
- Antepartum bleeding	0.009*	2.607 (1.242 – 5.473)
- Preeclampsia	0.000*	2.372 (1.688 – 3.333)
Neonatal		
- Prematurity	0.000*	4.055 (2.939 – 5.595)
- Postmature	0.001*	3.811 (1.637 – 8.872)
- Low birth weight	0.000*	5.833 (4.245 – 8.016)
Mode of delivery		
- caesarian section	0.000*	3.778 (2.750 – 5.190)
- forceps extraction	0.969	1.026 (0.311 – 3.386)
- vaccum extraction	0.169	1.498 (0.839 – 2.676)

DISCUSSION

Birth asphyxia is the one of the very common problem in neonatal health care. Asphyxiia can cause high morbidity and mortality regarding the insult of the brain. Incidence of prenatal asphyxia is about 1-1.5% in most centers in developed country and 3.3% in Pakistan. Its incidence is very high in the developing country where health facilities are restricted to urban area. (Azam 2004; Suwannachat 2004; Majeed 2007) In this study the incidence of asphyxia was high (8%). This incidence was similar with Shrestha (Shrestha 2009) Some conditions that related with higher asphyxia in this study was most of delivery was referral pregnant women with complication from other hospital.

Several studies have attempted to evaluate the incidence of asphyxia and its risk factor (Azam 2004; Suwannachat 2004; Majeed 2007; Shrestha 2009; Berglund 2010). The risk factors can be divided into maternal risk factors, neonates risk factors and mode of delivery. The maternal risk factors (preeclampsia, younger or older mother, antepartum bleeding) can be identified during ante natal care lead to better prevention of asphyxia (Azam 2004; Suwannachat 2004; Khreisat 2005; Majeed 2007) In this study the maternal risk factors that included in the analysis are age, premature rupture of the membran, antepartum bleeding and preeclampsia, but the significant risk factor are antepartum bleeding and preeclampsia The antepartum bleeding condition of the mother have increased the risk of 2.6 times to become asphyxia, this study is similar with the previous study (Azam 2004; Khreisat 2005) In the antepartum bleeding, there are decreased blood flow from mother to placenta so the

hipoxemia can occur in the fetus. This condition can lead to perinatal asphyxia if the tranfusion to the mother or delivery is postpone. (Galvin 2004; Adcock 2008)

Preeclampsia mother can increase the risk of asphyxia by 2.3 times in this study. From other study found the similar results (Azam 2004; Suwannachat 2004; Khreisat 2005) In the pre eclampsia mother there are abnormal tophoblastic invasion of both the maternal decidual arteries, this abnormal placetation is believed to lead to a reduction in placental perfusion and relative placental ischemia. (Mc Elrath 2008; Galvin 2004)

In this study, prematurity and low birth weight increasing the risk of asphyxia by 4 and 5.8 times, respectively. From the previous study showed similar result. (Costello 1994; Mir 1997; Ladakhi 2000; Suwannachat 2004; Azam 2004; Lee 2008) The premature and low birtth usually have pulmonary immaturity and limited respiratory muscle strength. Ventilatory support or resuscitation is needed in during delivery of premature baby. (Ringer 2008) In contrast to prematurity, the post mature infant have risk 3.8 times to become asphyxia. Previous showed the similar results (Mir 1997; Futrakul 2006; Berglund 2010) In the post mature condition there are some infactions and fibrosis of placenta so the blood flow from placenta to fetus decreased (Adcock 2008)

Mode of delivery is also one of the risk factors for asphyxia. Delivery by caesarian section have risk to become asphyxia by 3.7 times. Some previous studyies showed similar results. (Boo 1992; Azam 2004; Rachatapantanakorn 2005; Onyearugha 2010) This condition usually associated with emergency caesarian section (Rachatapantanakorn 2005). In this setting some degree of maternal diseases usually associated with the risk of asphyxia. Hence, ideally for caesarian section should be attended with resuscitation skilled pediatrician.

CONCLUSION

Risk factor for asphyxia were antepartum bleeding, preeclampsia, low birth weight, prematurity, post date delivery and caesarian section.

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