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Maternal and Fetal Factors Affecting Neonatal Outcome of Emergency Caesarian Section at Northern Mindanao Medical Center: A Secondary Analysis

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ABSTRACT

The study identifies maternal and fetal factors in outcomes of babies born to mothers who underwent emergency caesarian operation at NMMC recorded during the period covering 2002-2003. From the recorded births, the study yielded 368 mothers and 392 babies. Findings include average of mother who underwent emergency caesarian section (ECS) to be between 18-35 years with 2-5 pregnancies and/or deliveries. Outcomes of these ECS indicated a significant proportion of 36.7 percent of the babies born with an APGAR score of below 7 signifying varying degrees of depression and death of few babies (6.0 percent). Maternal factors were found the most frequent indication for ECS (50.0 percent of cases). Mothers more than 35 years old or with more than 5 preganancies and/or deliveries and those who were having babies below 37 weeks or above 41 weeks were found to be associated with poor outcomes or baby conditions. Hypertension followed by prenatal maternal bleeding and multiple medical problems were also noted for producing poor neonatal outcomes. Among the fetal factors found to produce poor neonatal outcomes are: abnormal FHR, oligohydraminios, cord prolapse, multiple fetal problems, meconium stain in IE, etc. Of these, cord prolapse was observed to the most dreaded fetal factor (50.0 percent of the babies).

Keywords: Maternal and Fetal Factors, Neonatal Outcome, Emergency Caesarian

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INTRODUCTION

Emergency caesarean section (ECS) is an important life-saving surgical procedure both to the parturient (mother) and to the unborn child in her womb. There are factors, both maternal and fetal, that lead to the decision to deliver the baby by emergency caesarean section rather than by vaginal delivery. More often than not, neonates born with low Apgar scores (Apgar, 1953) still continue to pose problems despite heroic efforts to prevent them through a procedure that has inevitably been done in "emergency."

This descriptive study aims to find out: what could be the important factors that lead to such outcomes? Are they preventable? Can the nurse

address such factors, especially in the prenatal period, in order to prevent or help reduce such incidence of dire caesarean section or its poor outcome?

Perceptibly, the researchers believe that more than the procedure itself, prenatal factors and those circumstances surrounding the delivery play a significant role to the delivery of a neonate with a poor outcome. This study will review records of those emergency caesarean section deliveries in the Northern Mindanao Medical Center (NMMC) from 2002-2003 in order to determine what factors were possibly involved, and thereby be able to formulate nursing interventions that may aid in preventing or managing such factors.

The APGAR score has traditionally been used as a simple yet sensitive tool in predicting neonatal outcome. Hence, it is the criterion that shall be used by this study. It is then apparent that a study should be done in order to identify maternal and fetal factors leading to adverse neonatal outcome in circumstances that necessitate an emergency caesarean section.

The Apgar score is a system of rating the pulse, respiration, muscle tone, color and reflexes of a newborn baby. It is the very first test given to the newborn and it was designed to quickly evaluate a newborn's physical condition and to determine any immediate need for extra medical or emergency care (Ural, 2004).The Apgar test is usually given to the baby twice: once at 1 minute after birth, and again at 5 minutes after birth. Rarely, if there are serious problems with the baby's condition and the first two scores are low, the test may be scored for a third time at 10 minutes after birth. Five factors are used to evaluate the baby's condition and each factor is scored on a scale of 0 to 2: Appearance (skin coloration), Pulse (heart rate), Grimace response (refleirritability), Activity and muscle tone, and Rate and effort (breathing). Doctors, midwives, or nurses add these five factors together to calculate the Apgar score. Apgar scores of 0-3 at 20 minute predict high mortality and morbidity.

Statement of the Problem

The researchers investigated into the factors leading to neonatal outcomes in the following manner.

1. What are the demographic data on the mothers who underwent emergency caesarian section at the Northern Mindanao Medical Center in 2002-2003 as to:
    a. Age,
    b. Gravidity,
    c. Parity,
    d. Age of Gestation?
2. What is the frequency and percentage of the neonates born from mothers who underwent ECS at the NMMC as to Apgar scores at birth?
3. What are the maternal and fetal factors that influenced neonatal

outcome in terms of APGAR scores of mothers who underwent ECS at the NMMC in 2002-2003?

4. What are the maternal and fetal factors that lead to poor neonatal outcome in mothers who underwent emergency caesarian section at the NMMC in 2002-2003?
5. What are the maternal and fetal factors are effectively modifiable in order to result in better neonatal outcome?
6. What interventions can we apply in order to improve neonatal outcome in high-risk pregnancies?

METHODOLOGY

Research Design

Secondary analysis was employed to investigate maternal and fetal factors that affected neonatal outcome in emergency caesarian sections at the Northern Mindanao Medical Center in the years 2002-2003. This quantitative, descriptive design was used to examine and summarize association of factors with outcome, which may suggest, but not necessarily establish causality. In this regard, the authors performed a secondary analysis of data obtained from hospital records.

Research Locale

Northern Mindanao Medical Center is a 300-bed capacity government hospital located at the Capitol Compound of Cagayan de Oro City, Philippines (Figure 2, Sketch Map of NMMC). Claro M Recto Highway, Corrales and Velez Streets bound the facility. Located in Misamis Oriental Province, this 87-year old tertiary health facility caters mostly to patients from Northern Mindanao (Region 10) and nearby localities.

Respondents

The study is limited to all female patients (368 mothers) who were subjected to emergency caesarian section in NMMC during the years 2002-2003. These patients were diagnosed with maternal and/or fetal conditions for which surgical delivery through the abdomen was indicated, and that vaginal delivery was impossible or contraindicated. Subsequently, their corresponding babies (i.e., the 392 neonates) were likewise treated as subjects in the study.

Sources of Data

Data were gathered from anesthesia records and Obstetrical Logbooks from the years 2002-2003 (Appendix 2,3). The surgical records of all Obstetrical cases written in the Logbooks provided adequate data on the patient, including age, number of previous pregnancies (gravidity) and number of previous deliveries (parity), the surgery done and neonatal outcome as reflected by APGAR scores. These logbooks presented data in chronological order (i.e., by date). Other details such as age of gestation, diagnosis, including maternal and

fetal conditions, complications and details on the operations were provided by the anesthesia records. These records were written on sheets that also reflected charts on the minutes of the operation, the anesthetic technique and many other details of the procedures.

Both research instruments also served to countercheck each other, as many of the data were similarly recorded in both. Inconsistencies or lack of data were also taken into account to eliminate possible errors.

Data Gathering Procedure

After obtaining approval of the study from the Research Consultants of Capitol University in Cagayan de Oro, permission from Northern Mindanao Medical Center was sought to examine hospital records relevant to the study. A formal letter accompanied by a research proposal was submitted to the Chief of Hospital, the Medical Training Officer and the Ethics Committee of the institution for approval of the study.

The research team first looked into the copies of anesthesia records which were filed separately by the Anesthesiology Department to determine which patients specifically underwent emergency caesarian section. Preliminary data such as names, hospital record numbers and dates of admission were gathered. From these records the team also collected data on mother's personal profile, including age, age of gestation, parity, presence or absence of medical illnesses, and preoperative fetal condition. Details on the diagnoses, surgical procedure, and complications were provided by the Obstetrical Logbooks. Finally the researchers recorded the number of babies delivered and their Apgar scores at 1 minute. APGAR scores at 5 minutes were not included.

Statistical Analysis

After data collection, collation and tabulation, computations of frequency and percentages were done to describe associations between factors and Apgar scores.

RESULTS AND DISCUSSION

Problem One: *What is the demographic profile of the mothers who underwent emergency caesarian section at the Northern Mindanao Medical Center in 2002-2003 as to Age, Gravidity, Parity, Age of Gestation?*

Table 1. Age grouping of mothers who underwent emergency caesarian section at NMMC in 2002-2003

Age Group (Years)	Frequency (n)	Percentage (%)
Less than 18	8	2.17
18-35	283	76.90
More than 35	77	20.93
Total	368	100

Table 1 shows the age grouping of mothers according to the age classification used by obstetricians to describe risk in pregnancy by age. Those mothers who were less than 18 years old, also described as teenage pregnancy, comprised 2.17%. Women who are regarded as belonging to the ideal age for childbearing, were classified in the 18 to 35 year-old group, and comprised 76.9%. Mothers more than 35 years old, classified under elderly pregnancy, comprised 20.93%.

Table 2. Gravidity of mothers who underwent emergency caesarian section at NMMC in 2002-2003

Gravidity	Frequency (n)	Percentage (%)
G1	150	40.76
G2-5	178	48.37
> G5	40	10.87
Total	368	100

Table 2 classifies the mothers according to the number of pregnancies they have had (i.e., gravidity) based on the risk classification used by obstetricians. Mothers who are having their first pregnancy (G1) consisted of 40.76% (n=150). Most (48.37%, n=178) of the mothers who underwent ECS have 2-5 pregnancies, while mothers with more than 5 pregnancies showed the least number at 10.87% (n=40).

Table 3. Parity of mothers who underwent emergency caesarian section at NMMC in 2002-2003

Parity	Frequency (n)	Percentage (%)
P1	156	42.39
P2-5	176	47.83
>P5	36	9.78
Total	368	100

Table 3 illustrates that majority (47.83%, n=176) among the mothers who underwent ECS have parity or had had deliveries 2-5 times, including the present delivery, closely followed by mothers who just had their first delivery at 42.39% (n=156). The groups of mothers with more than 5 deliveries were the least in number (9.78%, n=36).

Table 4 Groups according to age of gestation (AOG) of mothers who underwent emergency caesarian section at NMMC in 2002-2003

Age of Gestation (weeks)	Frequency (n)	Percentage (%)
Less than 37	46	12.50
37-41	292	79.35
More than 41	30	8.15
Total	368	100

Table 4 shows the age of gestation at delivery of the babies, classified according to viability. 79.35% (n=292) were 37 to 41 weeks old, called term pregnancy, 12.5% (n=46) were less than 37 weeks old or prematures, and only a few, 8.15% (n=30) were post term, or aged more than 41 weeks.

Having described the mothers included in the study, the next task is to describe the neonates whose conditions one minute after birth are being measured.

Problem Two: *What is the frequency and percentage of the neonates born from mothers who underwent ECS at the NMMC as to Apgar scores at birth?*

Table 5. Apgar scores among neonates grouped as to stillborn, severely depressed, moderately depressed, and normal delivered via ECS at the NMMC, January 2002 – December 2003.

Neonatal outcome According to APGAR score	Frequency (n)	Percentage (%)
Good outcome (APGAR Score > or = 7)	248	63.27
Poor outcome (APGAR Score < 7)	144	36.73
Apgar 0 (Stillborn)	25	6.38
Apgar 1-3 (severely depressed)	44	11.22
Apgar 4-6 (moderately depressed)	75	19.33
Apgar 7 – 10 (normal)	248	63.27

Majority of the neonates, 63.27% (n=248), showed a generally good outcome with Apgar scores of 7 to 10. However, a good number, 144 (36.73%) disclosed varying degrees of depression at delivery. Among those who had poor outcome, death (stillborn, Apgar 0) came in 6.38% (n=25) of the newborns, 19.33% (n=75) were moderately depressed, and 11.22% (n=44) were severely depressed.

Apgar scoring system is the predictor of the eventual prognosis among newborns and is used commonly by pediatricians and other allied caregivers worldwide (Ural, 1990). It is by far the simplest way to assess a newborn. In

this study, a large percentage showed depression, which pose an important risk in the subsequent development and growth of the baby as elucidated in several studies, books and authors (del Mundo, 1990). The loss of life in babies who were stillborn would create an emotional vacuum on the mothers who for nine long months had endured physical and emotional changes brought about by pregnancy.

These results are the main concern of this study, for which we now come to the investigation on the following problems

Problem Three: *What are the maternal and fetal factors that influenced neonatal outcome (Apgar Score) in mothers who underwent emergency caesarian section at the Northern Mindanao Center in 2003-2003?*

Table 6. Factors that influenced neonatal outcome in mothers who underwent emergency caesarian section at NMMC in 2002-2003

Factors	Frequency (n)	Percentage (%)
Maternal	184	50
Fetal	116	31.52
Combined	68	18.48
Total	368	100

Table 6 shows the factors that influenced the decision of the attending obstetricians for ECS. These factors were also the ones that may have influenced the outcome of the deliveries. The decision to do ECS were most likely based on a two-pronged benefit approach to save the mother and the baby's lives. Figure 6 illustrates that in 50% of cases, maternal factors represent the majority from which ECS was contemplated. Fetal factors (31.52%) signify as the second most common indication, while those with both maternal and fetal indications formed the least at 18.48%.

Table 7. Maternal factors in mothers who underwent emergency caesarian section at NMMC in 2002-2003

Maternal Factors	Frequency (n)	Percentage (%)
Cephalo-pelvic disproportion (CPD)	94	37.30
Hypertension	64	25.40
Bleeding	49	19.44
Multiple maternal problems	27	10.71
Multiple pregnancy	10	3.97
Others	8	3.17
Total	252	100

Table 7 depicts the mothers' medical conditions that may have influenced neonatal outcome. It shows that CPD comprise the most common maternal indication at 37.30% (n=94). Hypertension (25.40%) in all forms comprise the second most common indication, followed by bleeding, multiple maternal factors, i.e., having 2 or more medical conditions, and multiple pregnancy, i.e., having twins or triplets. Other factors such as diabetes mellitus, respiratory problems, etc, were sparse in the data and subsequently classified under "Others". 116 mothers were in good health but may have had fetal risk factors. Previous literatures cited in the preceding chapters have named the above maternal conditions as potential risk factors in pregnancy and delivery.

Table 8. Fetal factors in mothers who underwent emergency caesarian section at NMMC in 2002-2003

Fetal Factors	Frequency (n)	Percentage (%)
Difficult lie/presentation	64	34.78
Multiple fetal problems	40	21.74
Premature Rupture of Membranes (PROM)	39	21.20
Abnormal FHR Tracing	19	10.33
Oligohydramnios	13	7.06
Cord prolapse	6	3.21
Meconium stain on IE	3	1.63
Total	184	100

Table 8 presents the different fetal conditions that may have contributed to outcome of the deliveries. Only half, i.e., 184 of the undelivered mothers were diagnosed as having fetuses at risk. The most common fetal factor was the difficult lie or presentation at 34.78% (n=64). Multiple fetal problems and PROM had similar numbers closely representing 21% each, the second and third most common indications for ECS.

As previously discussed, obstetricians as those posing risk to the neonatal outcome recognize these factors. These are also the common indications for which the decision to resort to surgical means of delivery is made.

Having identified and presented the frequency of these factors the investigation proceeds to relate how these may affect the outcome of deliveries.

Problem Four. *Which specific factors lead to poor neonatal outcome in mothers who underwent emergency caesarian section at the Northern Mindanao Medical Center in 2002-2003?*

Table 9. influence of maternal age on neonatal outcome (APGAR Scores) in mothers who underwent emergency caesarian section at NMMC In 2002-2003

Age (years)	APGAR 0 (%)	APGAR 1-3 (%)	APGAR 4-6 (%)	APGAR 7-10 (%)	Total no. of Babies
<18	0	20	20	60	10
18-35	5	10.67	18	66.33	300
>35	12.2	12.2	23	52.4	82
Total no. of Babies	25	44	75	248	392

Table 9 shows the neonatal outcome as to Apgar scores relative to the maternal age. The outcomes are distributed across age groupings. Among babies born from mothers aged less than 18 years old, 60% were on Apgar 7-10, while 20% have scores 4-6, and those with Apgar 1-3 comprised 20%.

Among mothers aged 18-35 years old the neonatal outcomes revealed, 66% had Apgar scores 7-10, 18% had Apgar score between 4-6, while 10.67% had scores of 1-3, 5% were still born. Babies born from mothers more than 35 years old showed 52% had scores between 7-10, 23% had 4-6, 12.2% had 1-3, and 12.2% had Apgar score of 0.

Across age groups, mothers more than 35 years old have the most percentage of babies with depression, among whom, 12% succumb. This may indicate that this age group presents a serious factor to the neonatal outcome, an observation shared by Smith (2001). The possible reason for this is that mothers at an advanced age may have associated medical problems such as hypertension, diabetes mellitus and heart disease, all of which may decrease the quality of pregnancy. This indicates a possible relationship between the general health of the mother and the baby, which will be further elucidated by the data on maternal medical factors.

Table 10. Influence of gravidity on neonatal outcome (APGAR Scores) in mothers who underwent emergency caesarian section at NMMC In 2002-2003

Gravidity	APGAR 0 (%)	APGAR 1-3 (%)	APGAR 4-6 (%)	APGAR 7-10 (%)	Total no. of Babies
G1	5.23	16.34	19.61	58.82	153
G2-G5	7.03	5.53	20.10	67.34	199
> G5	7.5	20.0	12.5	60.0	40
Total no. of Babies	25	44	75	248	392

Table 10 depicts neonatal outcomes in terms of Apgar scores relative to gravidity distributed across gravidity grouping. Primigravids (1st delivery) mothers showed 58.8% of their babies with Apgar scores between 7-10, 19.6% had scores 4-6, 16.3% had score of 1-3, and 5.23% of the babies were stillborn. Mothers in the Gravidity 2 to 5 group showed 60% have babies with Apgar score of 7-10, 20% had Apgar score of 4-6, 5.5% had score between 1-3 and 7.03% were stillborns.

Mothers with more than 5 pregnancies had a similar proportion (60%) of babies with good outcome as in mothers who had their first baby, but the remaining number of babies with poor outcomes included more stillborns and severely depressed neonates. This correlates with the common teaching that having too many pregnancies may lead to poor maternal and subsequent fetal health, thus applied in most family planning programs. Although not included in the investigation, the possibility that more pregnancies may also be related to various maternal medical conditions may be pondered.

Table 11. Influence of parity on neonatal outcome (APGAR Scores) in mothers who underwent emergency caesarian section at NMMC In 2002-2003

Parity	APGAR 0 (%)	APGAR 1-3 (%)	APGAR 4-6 (%)	APGAR 7-10 (%)	Total no. of Babies
P1	5.3	17.88	18.54	58.28	151
P2-5	6.83	5.36	20.49	67.32	205
>P5	8.33	16.67	13.89	61.11	36
Total no. of Babies	25	44	75	248	392

Table 11 depicts the neonatal outcomes across parity groupings of the mothers. Among mothers on their first delivery, 58% had babies with scores between 7-10, 18.5% had 4-6 scores, 17.8% had scores 1-3, while 5% of the babies were stillborn.

Among mothers who had had 2 to 5 deliveries showed, 67% with 7-10 scores, 20% had 4-6, 5% had 1-3, 6.8% with 0 Apgar score.

Mothers who had more than 5 deliveries showed babies outcomes as: 61% with scores 7-10, 16.67% had 1-3 scores, 13.89% had 4-6, 8.33% were stillborn.

The proportion of severely depressed babies were similar for mothers who had their first babies and those who had more than 5. Only 20% of the mothers who had 2-5 deliveries were moderately depressed. These figures correlate to the commonly accepted recommendation of having a family size not more than 5, the basis for family planning programs.

Table 12. Influence of age of gestation (AOG) on neonatal outcome (APGAR Scores) in mothers who underwent emergency caesarian section at NMMC In 2002-2003

AOG (weeks)	APGAR 0 (%)	APGAR 1-3 (%)	APGAR 4-6 (%)	APGAR 7-10 (%)	Total no. of Babies
Less than 37	15.15	22.72	19.7	42.43	66
37-41	4.76	8.5	17.69	69.05	294
More than 41	3.13	12.5	31.25	53.12	32
Total no. of Babies	25	44	75	248	392

Table 12 depicts the neonatal outcomes across AOG groupings. Among babies who were less than 37 weeks AOG, 42.43% had Apgar scores 7-10, 22.72% had 1-3 scores, 19.7% had 4-6 Apgar, while 15% of them were stillborn. Among babies 37-41 weeks AOG, 69% had score 7-10, 17.69% had 4-6 scores, 8.5% had 1-3, and 4.76% were stillborn.

Babies who were more than 41 weeks AOG showed, 53% had Apgar scores 7-10, 31% with 4-6 Apgar, 8.5% had 1-3 scores, and 3% were stillborn. This observation is shared in the context of del Mundo (2001). With regards prematurity, since complete development of the fetus is halted at critical times, the ability to thrive may be compromised, thus poor neonatal outcome. Respiratory and cardiovascular systems may be underdeveloped so that the abrupt change of environment given at birth challenges the baby to survive.

On the other hand, post-maturity forces the baby to remain in an environment (the uterus) that may now be insufficient to meet its need. Uteroplacental insufficiency, a condition whereby exchange of substances across the placenta and the uterus from mother to baby is compromised, is commonly encountered by babies who remain in the uterus longer than usual (37-41 weeks).

Table 13 shows the maternal risks factors across the neonatal outcomes expressed in Apgar score categories. Among hypertensive mothers, less than 50% of their babies had good APGAR scores, most of them being depressed, and 1.5% were stillborn.

Among mothers who presented with bleeding, 14% were stillborn, the highest among the group. Among babies whose mothers had multiple problems, 57% had Apgar scores between 7-10, 20% had 4-6 scores, 6.25% had 1-3, and 4.16% were stillborn.

Mothers who presented CPD as the main factor for ECS had 70.8% of their babies with Apgar score between 7-10, 18.75% had 4-6, 6.25% showed 1-3

scores, and 4.16% presented a score of 0. Multiple pregnancy was also a factor for ECS among mothers, showed their babies having Apgar scores 7-10 in 81% of the time, 12.5% had 4-6 Apgar, and 6.25% showed 1-3 scores, none had 0.

Table 13. Influence of maternal medical risk factors on neonatal outcome (APGAR Scores) in mothers who underwent emergency caesarian section at NMMC In 2002-2003

Maternal Risk Factors	APGAR 0 (%)	APGAR 1-3 (%)	APGAR 4-6 (%)	APGAR 7-10 (%)	Total No Babies
Hypertension	1.5	18.18	33.33	46.96	66
Bleeding	14.0	18.0	12.0	56.0	50
Multiple problems	5.71	14.28	20.0	57.14	35
CPD	4.16	6.25	18.75	70.83	96
Multiple pregnancy	0	6.25	12.5	81.25	16
Others	0	10.0	10.0	80.0	10
None	9.24	8.40	15.97	66.39	119
Total no. of Babies	25	44	75	248	392

The NONE category represents fetal risk factors, elucidated elsewhere in this study.

Hypertension among mothers either pregnancy-related or pre-existing produced babies whose majority, at 52%, were depressed and consequently may require special resuscitative measures at birth. However, it is the bleeding factor that produced a good percentage, 14%, of fetal death could be due to acute blood loss that reasonably affected the fetus and potentially harmful to the mother.

Maternal bleeding is a recognized extreme emergency to cause a decision for immediate caesarian section. This is due to the dependence of the fetus on maternal circulation prior to birth for oxygen and food. Disrupting the supply will severely compromise availability of these substrates that are necessary for the fetus' survival, which explains the number of deaths from this condition.

Hypertension also affects the mother-baby circulation in a manner that decreases the supply of substrate by constriction of blood vessels supplying the uterus and the placenta. As such, the dependent fetus suffers in varying degrees proportional to the severity of the disease.

Table 14. Influence of fetal risk factors on neonatal outcome (APGAR Scores) in mothers who underwent emergency caesarian section at NMMC In 2002-2003

Fetal Risk Factors	APGAR 0 (%)	APGAR 1-3 (%)	APGAR 4-6 (%)	APGAR 7-10 (%)	Total No Babies
Abnormal FHR Tracing	15.78	31.58	31.58	21.05	19
Oligohydramnios	0	0	75.0	25.0	4
Cord prolapse	50.0	0	0	50.0	6
Multiple fetal problems	6.82	22.72	18.18	52.27	44
Meconium stain on IE	7.69	15.38	15.38	61.54	44
Difficult lie/presentation	4.17	9.72	37.5	65.28	72
PROM	5.0	12.5	15.0	67.5	40
None	5.15	7.22	18.04	69.59	194
Total	25	44	75	248	392

Table 15 depicts the neonatal outcomes across fetal risk factors among mothers who underwent ECS at NMMC. Among babies who presented with abnormal fetal heart tracing disclosed 31.58% each with Apgar scores of 1-3 and 4-6, 21% showed scores of 7-10, and 15.78% were stillborn. Those who had oligohydramnios in utero, 75% had Apgar scores between 4-6, and 25% had 7-10. None had score of 0 to 3.

Among babies who had cord prolapse as the consideration for ECS showed 50% were stillborn and 50% of them had Apgar scores of 7-10.Babies who had multiple problems showed 52% with scores between 7-10, 22.7% had 1-3, 18.7% showed scores between 1-3, and 6.8% were stillborn. Those who presented with meconium stain prior to ECS disclosed 61.5% had Apgar of 7-10, 15.38% had scores between 1-6, and 7.68% were stillborn.

Fetal risk factor as difficult presentation or lie showed, 65% with Apgar scores of 7-10, 37% had 4-6, 9.7% had 1-3 and 4% had 0 scores. Babies who had PROM as one of the compelling indications for ECS disclosed 67.5% with scores of 7-10, 15% had 4-6, 12% had 1-3 and 5% were stillborn.

79% of the neonates who have abnormal fetal heart rate tracing intrauterine, were depressed at birth, the most against any other category. Abnormal fetal heart tones as monitored by tracings from a machine, signals grave danger from any cause. Sometimes the direct cause may not be obvious to the obstetrician, thus a diagnosis alone of abnormality in the tracings may justify immediate delivery.

Oligohydramnios on the other hand showed 75% to cause moderately depressed babies. This condition signals other causes of depression such as

uteroplacental insufficiency and infection. Often when a mother comes to the hospital with this condition it is too late to improve the baby's outcome without resort to emergency caesarian section.

By far, the most fatal fetal risk factor was the cord prolapse in 50% of cases; in most instances these babies may have died due to asphyxia (depletion of oxygen supply). The uncut cord, while the baby is still undelivered represents the lifeline connecting the baby to its mother. When it comes out ahead of the baby it may be impinged and circulation may be compromised, thus the baby may suffer loss of oxygen and die. Abnormal fetal heart rates also consistently conferred cause for postnatal depression.

Problem Five: *Which of these maternal and fetal factors are modifiable in order to result in better neonatal outcome?*

Factors related to maternal characteristics such as age, gravidity, and parity may be modified not during pregnancy and delivery, but way before these stages in life occur. This has been the basis for advocating women's health and family planning, whereby it is highly recommended that women have their children at an ideal child-bearing age, between 18-35 years and choosing have a family size not greater than five. Of course, these recommendations are subject to personal preferences, religious beliefs and unavoidable circumstances.

Medical diseases such as hypertension are highly modifiable. Hypertension is a life-style related medical condition, which is affected by diet, exercise, and stress levels. Its prevention and management are dependent on the women and their caregivers. When associated with pregnancy, much more caution and cooperation are demanded from both.

Other maternal factors such as bleeding, multiple pregnancies, etc. are much more difficult to modify, if not completely impossible, but early identification of these problems during pregnancy may lead to timely intervention and favorable outcome.

Similarly, the mother has no direct control of the baby inside her womb. The health care workers have only the power to identify or diagnose fetal condition but not modify. However, timely intervention is still life saving if not producing good outcome. Cord prolapsed, having abnormal fetal heart rates, and oligohydramnios are inevitable but still manageable if diagnosed and managed early.

It is in this scenario that the researchers believe that educating the mothers may play an important pivotal point that may modify neonatal outcomes.

Problem Six: *What nursing interventions can we apply in order to improve neonatal outcome in high-risk pregnancies?*

On the basis of the findings, the researchers formulated an educational protocol for the pregnant women in general covering lectures on the modifiable factors of both maternal and fetal with the aim to have awareness and seek qualified medical or paramedical attention at once, when danger signs of pregnancy are noted.

CONCLUSION

Extremes of maternal reproductive ages (more than 35 years old), gravidity, parity (>5), and age of gestation (premature and post mature), were related to neonatal depression. Maternal hypertension was the most common medical cause of poor neonatal outcome, while bleeding caused most deaths of the baby at birth.

Abnormal FHR, oligohydramnios, cord prolapse, multiple fetal problems were identified to cause poor neonatal outcome. The common cause of poor neonatal outcome was abnormal FHR, but cord prolapse caused more deaths at birth than any other fetal factor.

Armed with these findings, the researchers performed health education on mothers-to-be participants in a locality of Northern Mindanao.

RECOMMENDATION

The authors advocate the following recommendations, further study on the topic of factors affecting neonatal outcomes in other hospitals of the city or region involving at least five to ten years study duration, the use of appropriate tools and records like pre-natal records, hospital admission charts, among others, conduct regular pre-natal lectures and information dissemination among expectant mothers as part of pre-natal care and follow-up the neonatal outcomes to validate previous study findings, information drive directed to health care givers including the hilots especially emphasizing on the factors that may affect neonatal outcomes, early danger signs of pregnancy to reduce neonatal complications at delivery

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