

Assessment Of Fetal Outcome In Women Undergoing Emergency Caesarean Section For Fetal Distress In Tertiary Care Hospital

Noor Fatima¹, Khansa Iqbal², Amna Abbasi³, Nabeela Waheed⁴, Amara Arooj⁵, Maliha Sadaf⁶

Abstract

Objective: This study aims to assess the fetal outcome in terms of early neonatal mortality among women undergoing emergency caesarean section for fetal distress.

Methods: It is a Descriptive cross-sectional study involving 167 patients who were diagnosed with fetal distress and underwent emergency c-sections. The study was conducted at the Department of Obstetrics & Gynecology Unit-II, Holy Family Hospital, Rawalpindi from 24-09-2018 to 24-03-2019. Frequencies of fetal death were evaluated. Effect modifiers were controlled by the stratification. A P-value of ≤ 0.05 was considered as significant.

Results: The mean maternal age of the study population was found to be 24.59 ± 3.20 years while the mean gestational age was recorded as 38.88 ± 1.40 weeks. Fetal death was observed in 6.6% (n=11) of the total study population. A statistically significant difference was present among APGAR score, gestational age and fetal weight. However, statistically no significant difference was observed among maternal age, maternal height and maternal weight.

Conclusions: The frequency of fetal death following emergency caesarean section for fetal distress was found to be 6.6% (n=11). A statistically significant difference ($P \leq 0.05$) was present among APGAR score, gestational age and fetal weight for fetal outcome in our study.

MeSH Keywords: fetal distress, caesarean section, Apgar score, neonatal mortality.

¹ WMO, GHD Azam Colony, Rawalpindi; ² Assistant Professor, Rawalpindi Medical University; ³ Senior Registrar, Rawalpindi Medical University; ⁴ Ex HOD, Gynae Unit II, Rawalpindi Medical University; ⁵ Assistant Professor, Rawalpindi Medical University; ⁶ Assistant Professor, Rawalpindi Medical University.

Correspondence: Dr. Amna Abbasi, Senior Registrar, Rawalpindi Medical University. Email: dramnahabbasi87@gmail.com

Cite this Article: Fatima N, Iqbal K, Amna Abbasi, Waheed N, Arooj A, Sadaf M. Assessment Of Fetal Outcome In Women Undergoing Emergency Caesarean Section For Fetal Distress In Tertiary Care Hospital. JRM. 2024 Sep. 27;28(3):384-387. <https://doi.org/10.37939/jrmc.v28i3.2450>.

Received November 11, 2023; accepted September 19, 2024; published online September 26, 2024

1. Introduction

Caesarean section delivery represents the most important operation in obstetrics and its incidence is on the rise throughout the world.¹ This increasing rate not only seems to improve the overall fetal outcome but is also linked with increased morbidity and costs. According to the most recent estimates the average global rate of caesarean section is 21.1%, ranging from 5% to 42.8% in the least and more developed regions respectively.² In sub-Saharan African countries lowest rates of caesarean section are found in Chad 1.3% and the highest in South Africa 24.5%.³ Latin America is the region with the highest cesarean section rate. It also remained the region with the largest absolute increase rate (19.4 points) from 1990 to 2014.⁴

American Pregnancy Association defined fetal distress as the condition in which a fetus does not receive an adequate amount of oxygen during pregnancy or labour. Currently, fetal distress is also replaced by the term non-reassuring fetal status.⁵ Intrapartum hypoxia complicates about 1% of labourers and its pathogenesis is multifactorial.⁶

However once fetal distress is diagnosed delivery is to be expedited and the aim is to deliver swiftly within 30 minutes to avoid fetal death or poor fetal outcome. The rising caesarean birth rate is a worldwide problem and has been introduced widely in most of the developing countries including Pakistan. Fetal distress is one of the four major indications for caesarean-section, others being dystocia, previous caesarean and breech presentation. A goal which is continually pursued during labour is to detect early signs of fetal compromise and intervene immediately to avoid adverse neonatal outcomes.⁷ Identification of a fetus at risk of hypoxia is not always easy. The methods most commonly used include auscultation of fetal heart, detection of meconium and electronic fetal heart monitoring if facilities are available. Neither electronic FHR monitoring nor auscultation has proved effective in predicting the degree of fetal hypoxia in the intrauterine life or the neonatal outcome. Diagnosis of fetal jeopardy based on CTG alone has led to an increase in caesarean section rate.⁸ Rise in caesarean section frequency has been associated with a drop in the perinatal mortality rate however not only this but improved antenatal care, organized referral system, better intrapartum



fetal surveillance and advanced pediatric care are also other contributing factors.⁹

According to WHO, caesarean section done when medically indicated has led to a decrease in perinatal mortality and morbidity, so all efforts should be made to provide cesarean section to women in need rather than achieving a specific rate.¹⁰

In our settings the prevalence of fetal distress is high due to inherent shortcomings of obstetrics services, and so is the rate of emergency cesarean section. Our study will evaluate the fetal outcome in women undergoing emergency cesarean section for fetal distress and its results may contribute to the development of guidelines for fetal care in Pakistan.

2. Materials & Methods

It is a Descriptive cross-sectional study conducted at the Department of Obstetrics & Gynecology, Unit-II, Holy Family Hospital, Rawalpindi from (24-09-2018 to 24-03-2019) involving 167 patients who fell in the reproductive age group and diagnosed with fetal distress and underwent emergency c-section was included in the study. Mothers who had definite antenatal complications (diabetes, hypertension, heart disease, endocrine disorder etc.) that would adversely affect neonatal outcome and mothers having fetuses with congenital anomalies were excluded from the study. Similarly, patients who underwent Caesarean section classified other than emergency according to the WHO classification of caesarean section were also excluded.¹¹ The sample size was calculated by using the WHO sample size calculator by taking a confidence interval of 95% and margin of error of 5% and a population proportion of 31% as obtained from a study by Benzouina S et al.¹⁰

The data collection was done by self-designed well validated questionnaire obtained from published literature that included multiple variables like inpatient registration number, referral status, maternal age and blood group, maternal weight and height, gravidity and parity, prenatal care (the number of prenatal visits and obstetric ultrasonography was retrieved), history of miscarriage or infertility, previous perinatal death, maternal chronic disease (chronic hypertension, diabetes mellitus), pregnancy complications (gestational hypertension, gestational diabetes mellitus, third trimester bleeding, premature rupture of membranes, pre-eclampsia, eclampsia, HELLP syndrome, placental

abruption, placenta previa, intrapartum fever, documented urinary tract infection, prelabor rupture of membranes), presentation of the fetus, mode of delivery (elective or emergency caesarean section), indication of caesarean section, type of anesthesia (general anesthesia or regional block), date and time of birth, newborn's sex and weight, gestational age, APGAR score, abnormalities on physical examination and initial care to the newborn, need for resuscitation, newborn outcome until discharge, admission in neonatal intensive care unit. Data analysis was done by using SPSS V. 23. Descriptive statistics (percentages, mean, SD) were used to calculate age, maternal weight, height and gestational age. Frequency and percentage were calculated for the fetal outcome. Effect modifiers maternal age, weight, height, gestational age and APGAR scores were controlled by stratification. Post-stratification chi-square test was applied. P value ≤ 0.05 was considered significant.

3. Results

Demography of the selected population

A total of one hundred and sixty-seven (n=167) female pregnant patients aged 20-46 years, who were diagnosed with fetal distress but underwent emergency c-section were selected in this study after the informed consent from every patient. Exclusion criteria were strictly followed. After enrollment demographic and clinical profile of the patients were recorded. Fetal outcome was measured as defined in the operational definition. The mean maternal age in the total study sample was found to be 24.59 ± 3.20 years while the mean gestational age of the total study population was recorded as 38.88 ± 1.40 weeks. Fetal weight and APGAR score were also recorded for all the enrolled patients and found that the mean fetal weight was $3.02 \pm .56$ kg while 76% of fetuses were presented with Good APGAR scores Table 1.

Table 1: Classification of fetal APGAR score of the total study population

Apgar score	Frequency	Percentage
Good	127	76.0%
Moderate	33	19.8%
Poor	7	4.2%
Total	167	100%

Fetal Outcome and its Stratification

Fetal death was observed in 6.6% (n=11) of the total study population (table 2).

Table 2: Fetal outcome in the study sample

Fetal Outcome	Frequency	Percentage
Survival	156	93.4%
Death	11	6.6%
Total	167	100%

Fetal outcomes were stratified for demographic effect modifiers like maternal age, maternal weight, maternal height, gestational age, APGAR Score and fetal weight. Results reflected that a statistically significant difference was present among APGAR score, gestational age and fetal weight. However, statistically no significant difference was observed among maternal age, maternal height and maternal weight. Results are explained comprehensively in Tables 3 and 4, . P-value ≤ 0.05 is considered significant.

Table 3: Stratification of fetal outcome in study sample based on different APGAR score categories

Fetal outcome	Apgar score			Total	P-value
	Good	Moderate	Poor		
Survival	127	29	0	156	< 0
	100%	87.9%	0%	93.4%	
Death	0	4	7	11	
	0.0%	12.1%	100.0%	6.6%	
Total	127	33	7	167	
	100%	100%	100%	100%	

Table 4: Stratification of fetal outcome in study sample based on different fetal weight categories

Fetal outcome	Fetal Weight Group		Total	P-Value Chi-Square
	≤ 3 KG	> 3 KG		
Survival	87	69	156	0.004
	88.8%	100%	93.4%	
Death	11	0	11	
	11.2%	0%	6.6%	
Total	98	69	167	
	100%	100%	100%	

4. Discussion

The number of deliveries by caesarean section has been increasing steadily. With the increase in the rate of caesarean section, it is expected that emergency caesarean section will also increase as well.¹² Fetal distress is one of the four major indications for caesarean section, others being dystocia, previous caesarean and abnormal presentation.¹³ A study from Sri Lanka revealed that 20% of caesareans were carried out due to fetal distress.¹⁴ But identification of actual fetal distress is not always easy. The most commonly used methods include auscultation of fetal heart, detection of meconium and electronic fetal heart monitoring if facilities are available. Neither electronic FHR

monitoring nor auscultation has proved effective in predicting the degree of fetal hypoxia in the intrauterine life or the neonatal outcome. Diagnosis of fetal jeopardy based on CTG alone has led to an increase in C-section rate.¹⁵ So we conducted this study to find out fetal outcomes after emergency C-sections in women with fetal distress and gather data on the fetal outcomes in our settings as very limited data is available on this topic within Pakistan. Moreover, we conducted this study to contribute knowledge in developing guidelines regarding fetal care in Pakistan. Gangwar R and colleagues documented the fetal outcomes in their recently published prospective observational study of women who underwent caesarean section for fetal distress where the mean age of the patients was 24.5 years which is similar to our study. They found that 14.38% of cases diagnosed with fetal distress subsequently had poor outcomes. Twenty-one babies had a 5-min Apgar score <7 , required immediate resuscitation and was admitted to NICU. Twelve fetuses had a 1-min Apgar score <4 , while there were three cases of severe birth asphyxia (Apgar score <4 at 5 min). Out of these, two babies died. They concluded that the diagnosis of fetal distress is imprecise and a poor predictor of fetal outcome. This leads to a tendency for unnecessary C-sections.¹⁶ Another retrospective study by Darnal N determined the rate, indications and fetal outcome of emergency C-Section and they found that the emergency C-Section rate was (74.4%) from 1324 study samples. Emergency C-Section had a poor fetal outcome due to fetal distress (57.6%) which is more than in our study. They concluded that fetal distress was the most common indication for emergency C-Section and it recorded a high fetal complication. Early recognition through good intrapartum monitoring and early referral of mothers who are likely to undergo C-sections may reduce the incidence of poor fetal outcomes in emergency C-sections and thus decrease its complications.¹⁷ In this study, we tried to investigate the fetal outcome following an emergency caesarean section for fetal distress/non-reassuring fetal heart and we identified that the fetal death rate following an emergency caesarean section is not very high. On the other side, the lack of adverse outcomes could reflect that our unit makes decisions at a time before clinically significant fetal compromise occurs. However, our study has some limitations like a very small study population size as well as it has been conducted on a population with

a very limited demographic profile. We recommend further large-scale studies to overcome these limitations.

5. Conclusion

Our study found the frequency of fetal death following emergency caesarean section for fetal distress to be 6.6% which is not high but our study had some limitations like the study population was small with a small demographic profile we recommend large-scale studies for the randomization of results to overcome limitations.

INSTITUTIONAL REVIEW BOARD

00291116MMANA Dated 30-11-2016

CONFLICTS OF INTEREST- None

Financial support: None to report.

Potential competing interests: None to report

Contributions:

N.F, A.A³, A.A⁵ - Conception of study

N.F, - Experimentation/Study Conduction

K.I, N.W, M.S - Analysis/Interpretation/Discussion

N.F, K.I, A.A, N.W, A.A⁵ - Manuscript Writing

K.I, A.A³, N.W, MS - Critical Review

All authors approved the final version to be published & agreed to be accountable for all aspects of the work.

References

- Haq AIU, Kiyani K, Sadiq N, Bashir S, Shabana N, Pakistan Go Perinatal outcome in women undergoing emergency C-section secondary to presumed fetal distress on CTG. *J Soc Obstet Gynaecol Pak.* 2022; 12(2):78-82
- Betran AP, Ye J, Moller AB, Souza JP, Zhang J. Trends and projections of caesarean section rates: global and regional estimates. *BMJ global health.* 2021 Jun 1;6(6):e005671. <https://doi.org/10.1136/bmjgh-2021-005671>
- Islam M, Sathi N J, Hossain M T. Caesarean delivery and its association with educational attainment, wealth index, and place of residence in Sub-Saharan Africa: a meta-analysis. *Sci Rep* 12, 5554 (2022). <https://doi.org/10.1038/s41598-022-09567-1> (NA)
- Betrán AP, Ye J, Moller AB, Zhang J, Gülmezoglu AM, Torloni MR. The Increasing Trend in Caesarean Section Rates: Global, Regional and National Estimates: 1990-2014. *PLoS One.* 2016 Feb 5;11(2):e0148343. doi:10.1371/journal.pone.0148343. PMID: 26849801; PMCID: PMC4743929.
- Elias S, Wolde Z, Tantu T, Gunta M, Zewudu D. Determinants of early neonatal outcomes after emergency cesarean delivery at Hawassa University comprehensive specialized hospital, Hawassa, Ethiopia. *PLoS One.* 2022;17(3):e0263837. <https://doi.org/10.1371/journal.pone.0263837>
- Sutovska H, Babarikova K, Zeman M, Molcan L, Prenatal Hypoxia Affects Foetal Cardiovascular Regulatory Mechanisms in a Sex- and Circadian-Dependent Manner: A Review. *Int. J. Mol. Sci.* 2022, 23, 2885. <https://doi.org/10.3390/ijms23052885>
- Hailegebreal S, Gilano G, Seboka BT, Ahmed MH, Simegn AE, Tesfa GA, et al. Prevalence and associated factors of caesarian section in Ethiopia: a multilevel analysis of the 2019 Ethiopia Mini Demographic Health Survey. *BMC Pregnancy Childbirth.* 2021;21(1):798. <https://doi.org/10.1186/s12884-021-04266-7>
- Andisha E, Cronje L. Evaluating the decision-to-delivery interval in category 1 emergency caesarean sections at a tertiary referral hospital. *S Afr J Obstet Gynaecol.* 2020;25(3):95–99. doi:10.7196/sajog.1510
- Ghosh R, Santos N, Butrick E, Wanyoro A, Waiswa P, Kim E, et al. Stillbirth, neonatal and maternal mortality among caesarean births in Kenya and Uganda: a register-based prospective cohort study. *BMJ Open.* 2022 Apr 6;12(4):e055904. doi: 10.1136/bmjopen-2021-055904. PMID: 35387820; PMCID: PMC8987792.
- <https://www.who.int/publications/i/item/WHO-RHR-15.02>
- <https://www.who.int/publications/i/item/9789241513197>
- Guan P, Tang F, Sun G, Ren W. Prediction of emergency cesarean section by measurable maternal and fetal characteristics. *J Investig Med.* 2020;68(3):799–806. doi:10.1136/jim-2019-001175
- Singh N, Pradeep Y, Jauhari S. Indications and determinants of cesarean section: A cross-sectional study. *International Journal of Applied and Basic Medical Research.* 2020 Oct 1;10(4):280-5. https://doi.org/10.4103/ijabmr.ijabmr_3_20
- Sivasuriya M, Sriskanthan R. C-section. *Aust N Z J Obsteric Gynecology.* 1988;28:96-8.
- Gupta K, Haritwal A, Makhija B, Bhandari R. Is fetal ctg a reliable indicator of fetal distress? A prospective study on relationship between ctg suspected fetal distress and immediate postpartum umbilical cord blood ph. *Journal of Clinical Medicine of Kazakhstan.* 2022;19(1):57-64
- Gangwar R, Chaudhary S. Caesarean Section for Fetal Distress and Correlation with Perinatal Outcome. *J Obstetric Gynecology India.* 2016;66:177–80. <https://doi.org/10.1007/s13224-015-0831-5>
- Darnal N, Dungal G. Maternal and fetal outcome in emergency versus elective caesarean section. *J Nepal Health Res Counc* 2020 Apr-Jun;18(47): 186-9. <https://doi.org/10.33314/jnhrc.v18i2.2093>