

PACIFIC JOURNAL OF MEDICAL SCIENCES

{Formerly: Medical Sciences Bulletin}

ISSN: 2072 – 1625



Pac. J. Med. Sci. (PJMS)

www.pacjmedsci1625.com. Email: managingeditorpjms1625@gmail.com.

OUTCOME OF EMERGENCY CAESAREAN SECTIONS IN A SAUDI GENERAL HOSPITAL: A COMPARISON OF LOWER VERSUS HIGHER NUMBER OF REPEAT SURGERY

Running title:

Emergency Caesarean Section in a Saudi General Hospital: A Comparison of Lower versus Higher number of Repeat Surgery.

**¹ E O FARINLOYE, ¹ N A ADELEKE*, ¹ O M ABIODUN,
² OLUBUKUNOLA OMOBUWA, ³ MOHAMMAD HUSIEN**

1. Department of Obstetrics and Gynaecology, Osun State University, Osogbo.
2. Department of Community medicine, Osun State University, Osogbo.
3. Maternity and Children Hospital MCH, Hafar Al- Batin.

*Corresponding Author: Najemdeen.adeleke@uniosun.edu.ng

OUTCOME OF EMERGENCY CAESAREAN SECTIONS IN A SAUDI GENERAL HOSPITAL: A COMPARISON OF LOWER VERSUS HIGHER NUMBER OF REPEAT SURGERY

Running title:

Emergency Caesarean Section in a Saudi General Hospital: A Comparison of Lower versus Higher number of Repeat Surgery.

**¹ E O FARINLOYE, ¹ N A ADELEKE*, ¹ O M ABIODUN,
² OLUBUKUNOLA OMOBUWA, ³ MOHAMMAD HUSIEN**

1. Department of Obstetrics and Gynaecology, Osun State University, Osogbo.
2. Department of Community medicine, Osun State University, Osogbo.
3. Maternity and Children Hospital MCH, Hafar Al- Batin.

*Corresponding Author: Najemdeen.adeleke@uniosun.edu.ng

ABSTRACT:

Caesarean section (CS) is frequently employed in the delivery of the New born as alternative route to otherwise problematic vaginal birth. National and regional CS rates as well as the number of surgeries the individual woman may be exposed to are on the increase. This retrospective comparative study carried out in a Saudi Arabian General Hospital, compared the foetal and maternal outcome in lower number ≤ 3 with higher number ≥ 4 repeat caesarean section.

Results: Out of Maternal population of 364 women, those who are age group 31 to 40 years accounted for 234 (64.3%). 188 (51.7 %) were unbook. 56 (15.3 %) of surgeries were in preterm. In 145 (43.7 %) previous CS was the sole indication and mother refusing vaginal birth is the reason in 96 (26.9 %). Foetal distress and antepartum haemorrhage are the other common indications. Only 32 (8.8%), 66 (18.1%) and 10 (2.7%) of mothers respectively stayed 3 days post operation or more, had blood transfusion and had wound sepsis. For the New born, out of a total of 364, Twelve (3.3 %) and 134 (36.8%) of the babies had low APGAR (appearance, pulse, grimace, activity, respiration) at 1st minute and Neonatal intensive care unit (NICU) admission respectively. Blood transfusion is statistically correlated with number of CS ($p < 0.001$). Low APGAR at 1st minute, Low birth weight and NICU admission were significantly correlated with the number of CS, each has ($p < 0.001$).

Conclusion: The results obtained in this study, indicate that emergency Caesarean Section was safe for both mother and baby. Higher repeat Caesarean Section was associated with blood transfusion in the mother and Neonatal intensive care admission in the New born.

KEY WORDS: Caesarean Section; Emergency; Out-Come

INTRODUCTION

Emergency caesarean section is a major obstetric operation that is carried out on a pregnant woman to deliver the fetus per abdomen whenever there is a threat to either the life of the fetus or mother and sometimes both [1]. This implies that indications for the surgery must be defined and cannot be trivialised.

Generally, caesarean section is one of the commonest surgeries globally [2], the rate of which had progressively increased from 7% in the early 1990s to around 20% in the year 2014 [3, 4]. The increase in the developed world is even higher. The World Health Organization WHO set Caesarean section (CS) rate of 10-15 % for the global community [5].

The secondary healthcare level is a significant part of the health management system in the Kingdom of Saudi Arabia (KSA) which happens to be a welfare state. The lower level refers patients needing expert care to this level, domiciled at the general hospitals, the majority of which are spread across the districts in the regional directorates of KSA [6].

The operation of Caesarean section would yield favourable outcomes for the foetus and the mother when it is employed rightly including timeliness [7]. Hence, hospitals rendering maternity services should be prepared for Emergency Obstetric Cares (EOC) which include emergency CS and must be able to meet

up with such emergencies within the allowed time frame [8, 9].

The American College of Obstetricians and Gynaecologists (ACOG) along with the Royal College of Obstetricians and Gynaecologist (RCOG) have both recommended a decision – delivery interval (DDI) of 30 minutes, [10, 11], but unfortunately many hospitals in several countries, especially in the developing world are yet to attain this standard [12]. These failures may contribute to unfavourable outcomes on the long run. In some instances, these unfavourable outcomes ended up in medico – legal suits against the facilities and the practitioners [13].

A number of studies have been carried out, mostly in developing countries to assess how the decision – delivery intervals affected the outcomes of emergency Caesarean section especially in relations to the newborn babies. In a study from Ethiopia, on “effects of decision to delivery interval on perinatal outcomes during emergency cesarean deliveries” it was discovered that the average decision to delivery time was 43.73 ± 10.55 minutes [14]. The elongated decision to delivery interval was found to have a significant association with adverse perinatal outcomes [14]. In another study titled “decision to delivery interval and associated factors for emergency cesarean section” which was a cross-sectional study, a decision-to-delivery interval below 30 min was found in only 20.3% of emergency cesarean section [15]. The

results showed that referral status, time of the day the emergency cesarean section occurred, status of surgeons, type of anesthesia, and transfer time were factors significantly associated with the decision to delivery interval [15]. Furthermore, a similar study titled “the decision delivery interval in emergency caesarean section and its associated maternal and fetal outcomes at a referral hospital in northern Tanzania: a cross-sectional study”, the median decision to delivery interval was one hour [16]. The authors reported that just 12% of the cases was the interval within 30 minutes. In the study there was no significant relationship between decision delivery interval (DDI) and the transfer of the neonates, Apgar scores at first and fifth minutes, maternal blood loss, and the duration of hospital admission [16]. The impact of DDI on the outcome of ECS has been well researched. In the KSA the Ministry of Health Obstetrics Protocol prescribed DDI of half an hour and most health institutions in the country observed the protocol. However, the effects of many repeat surgeries on the fetomaternal outcome has not been evaluated.

This study was carried out in a facility that has been able to eliminate wide variation in decision delivery interval (DDI) in cases of emergency caesarean section. This was a retrospective study. The maternal and perinatal outcomes of emergency Caesarean sections were reviewed, comparing the lower ≤ 3 versus higher number of repeat ≥ 4 surgeries.

METHODOLOGY:

Study site: The study was carried out at a Maternity and Children Hospital Hafer Al-Batin, Eastern Province Kingdom of Saudi Arabia KSA. Location: Latitude 28.446959 and Longitude: 45.948944 coordinates.

The hospital is a secondary level referral health facility, with annual delivery of about 4000.

Through a retrospective comparative study, the records of all women who had emergency CS carried out from August 2017 to November 2019 in a general hospital were accessed. Using a Pro forma data instrument information were extracted on socio-demography, indications for surgery, number of CS per woman, Gestational Age, and fetomaternal outcome.

Data Processing: The data were entered into the computer in a double entry fashion and cleaned. Analysis was carried out with SPSS version 20. Outcome measures.

Maternal: Number of days on admission, blood transfusion requirement and post op infection.

New born: APGAR score at 1st minute, gestational age, admission into Neonatal intensive care units (NICU) and birth weight.

Ethics: Ethical approval for the study was obtained from ethic research committee of College of Health Sciences, Osun State University.

RESULTS.

Table 1 depicts socio-demography typical of women in their reproductive age group with age group 31 to 40 years constituted 64.3 %. Non-Saudis made up only 15.9 %. Un-booked status

constituted 48.4 %, and high parity, $\geq P4$ accounted for 75.3 % of cases.

Preterm birth accounted for 29.1 %. Previous Caesarean section (CS) profile showed that 69.8 % was repeat surgery with 20.0% classified as higher order repeat C/S i.e. more than 3 previous scars. Only 3 in 10 are primary C/S.

Table 2: The detailed individual indications for the emergency c/s were depicted. The four leading indications were previous CS, Foetal distress, Ante Partum Heamorrhage and Severe Preeclampsia PET, together these four accounted for 82.2 % of cases.

Maternal outcomes are presented in Table 3. Of the 364 cases, three hundred and thirty two (91.2 %) were discharged within 3 days of surgery, 66 (18.7 %) had blood transfusion while 10 (2.7 %) had postoperative wound infections;

most of them minor being limited to the skin and subcutaneous levels.

The New born outcome (Table 4) showed 250 (68.7 %) had good APGAR score of 8/10 at 1st minute, and 134 (36.5 %) were admitted in to NICU. Only 30 (8.2 %) had low birth weight.

The correlation of maternal out come and the number of repeat CS are presented in table 5. Only blood transfusion was significantly associated the number of previous c/s, $p < 0.001$ The outcome in the New born correlated with the number of repeat surgeries, showed that APGAR score at 1st minute, $p < 0.001$ lower foetal weight $p < 0.001$ and admission in to Neonatal intensive care unit (NICU) $p < 0.001$, all were significantly associated with the number of surgery (Table 6).

Table 1: socio demography.	Frequency: N = 342 (%)
Age in year	
Mean \pm SD	33 \pm 5.9
≤ 19 years	8 (2.2)
20-29 years	98 (26.9)
30-39 years	234 (64.3)
≥ 40 years	2 (6.6)
Nationalist of respondents (N = 364)	
Saudi	306 (84.1)
Non-Saudi	58 (15.9)
Booking status (N = 364)	
Booked	188 (51.6)
Unbooking	176 (48.4)
Parity (N = 364)	
P 0	30 (8.24)
P 1-3	60 (16.48)
P 4-6	162 (44.51)
$\geq P 7$	112 (30.77)
Gestational age (364)	

26-30 weeks	14 (3.85)
31-36 weeks	92 (25.27)
37-40 weeks	246 (67.58)
>40 weeks	12 (3.30)
Number of Previous C/S (364)	
0 (Primary)	110 (30.21)
1-3	180(49.45)
≥4	74(20.24)

Table 2: INDICATIONS FOR THE EMERGENCY C/S (N 364)

Diagnosis	Frequency (%)
Previous ≥2 c/s	159 (43.7)
Foetal distress.	20 (5.5)
Antepartum Hemorrhage.	25 (6.9)
Breech presentation.	13 (3.6)
Failure to progress in labour.	14 (3.8)
Severe Hypertension (PET).	15 (4.1)
Refuse VBAC	95 (26.1)
Transverse lie in labour	4 (1.1)
Bad obstetric history	11 (3.0)
Multiple indications	8 (2.2)
Total	364

Table 3. Maternal outcome.

Variables	Frequency (%)
Duration of Hospital stay (N = 364)	
Mean ± SD	3±0.7
1-3 days	332 (91.2)
>3 days	32(8.8)
Blood transfusion	
Negative	298 (81.9)
Positive	66 (18.1)
Post-op infection	
Negative	354 (97.3)
Positive	10 (2.7)

Table 4: Foetal outcome.

Variables	Frequency (%)
Apgar score at 1st minutes of life	
Mean ± SD	7±1.7
8-10	250 (68.7)
5-7	102 (28.0)
<5	12 (3.3)

Birth weight	
Mean \pm SD	3.1 \pm 0.4
Low birth weight (<2.5 kg)	30 (8.2)
Normal birth weight (2.5–4.49 kg)	330 (90.7)
Big baby (\geq 4.5 kg)	4 (1.1)
Nicu admission	
Negative	230 (63.2)
Positive	134 (36.8)

Table 5: Association between number of Previous C/S and Maternal outcome

Variables	Numbers of previous C/S			Chi-Square	df	p-value
	None	1-3 times	\geq 4 times			
Discharge day				3.182	2	0.204
1-3 days	96(26.4)	168(46.2)	68(18.7)			
>3 days	14(3.8)	12(3.3)	6(1.6)			
Blood transfusion				22.690	2	<0.001*
Negative	88(24.2)	162(44.5)	48(13.2)			
Positive	22(6.0)	18(4.9)	26(7.1)			
Clinical infection				4.086	2	0.130
Negative	106(29.1)	178(48.9)	70(19.2)			
Positive	4(1.1)	2(0.5)	4(1.1)			

Table 6: Association between number of Previous C/S and foetal outcome

Variables	Numbers of previous C/S			Chi-Square	df	p-value
	None	1-3 times	\geq 4 times			
Apgar score at 1st minutes of life				61.784	4	<0.001*
8-10						
5-7	48(13.2)	154(42.3)	48(13.2)			
<5	52(14.3)	26(7.1)	24(7.1)			
Birth weight				24.394	4	<0.001*
Low birth weight (<2.5 kg)	18(4.9)	10(2.7)	2(0.5)			
Average birth weight (2.5–4.49 kg)	88(24.2)	170(48.7)	72(19.8)			
Big baby (\geq 4.5 kg)	4(1.1)	0(0.0)	0(0.0)			
Nico admission				43.227	2	<0.001*
Negative	42(11.5)	130(35.7)	58(15.9)			
Positive	68(18.7)	50(13.7)	16(4.4)			

DISCUSSION:

The current practice in KSA as recommended by the Ministry of Health MOH is to offer Bilateral tubal ligation BTL to a woman who is going for the 5th C/S. However, if such woman declined, BTL should not be done. This liberal policy on the number of C/S a woman can undergo has

led to cases of women coming for 8th even 9th repeat C/S, sometimes in emergency situation. Delivery after 2 previous CS were by elective repeat CS. However, many of these multiple previous CS do present at the facility for the first time in labour, with imminent uterine rupture or bleeding per vaginal Ante partum Haemorrhage

(APH) from undiagnosed placental previa and other co-morbidities.

Socio-demography revealed 3 in 5 of the women are in the 4th decade of life. This may be a reflection that women continue procreation till the end of reproductive age in this environment, the fact that 3 in 4 of them are grand multipara corroborated this observation. About one in six are non-Saudis. Almost half 176 (48.4%) of the women presented as unbook emergency at Maternal and Child Hospital MCH, this is quite worrisome. Some of the women might have been receiving ANC at lower level facilities and sometimes in private hospitals only to show up at the public secondary health facility for delivery and in emergency conditions. These scenario created unbook emergency at the receiving health facility and constitute risk factor for adverse obstetrics outcome (17). In order to reverse the situation women with multiple previous C/S and their Husbands should be counselled to book for ANC at facilities with capacity for surgical deliveries. The Clinicians running private health facilities should refer such patients early enough if the women will not be delivered in their facility.

The patterns of indications were shown in tables 1 and 2. The leading reasons for surgeries are Previous CS in labour, Antepartum haemorrhage, Hypertensive disorders in pregnancy and Foetal distress. This is typical of emergency CS in Obstetrics (18). However, the large number of previous CS in this review is worth reporting as it constituted sole indication

in more than 4 in 10, and contributed in another 3 in 10 caesarean section. This may be a reflection of high CS rate in the Kingdom and the reason for this may not be different from what obtains else with higher CS rates. This is connected to high litigation rate, attendant defensive obstetrics practice and high background primary CS. .

Among the factors impacting on the fetomaternal outcome of emergency CS are indication, pre-operative patient preparation, post-operative care and competency of the surgeon, the number of previous surgeries the woman had, could be an important determinant of fetomaternal outcome of the procedure [10]. The pattern of indications are outlined in table 2. There is relative uniformity in the other factors listed above at the facility of study and elsewhere except the number of previous CS exposure, which is higher in KSA, therefore, the possible impact of the number of previous CS on the outcome of the emergency surgery for both the mother and the baby was analysed in this study. The finding may enable us recommend a further research into the liberal use of CS with a view to putting a upper limit to the number.

The maternal outcome endpoints of interest are duration of hospital stay, blood transfusion and post-operative infection. The baby outcome endpoints were APGAR score at first minutes of life, admission to neonatal intensive care unit (NICU). In this study the number of surgeries were grouped in to lower, i.e. 1 to 3, and higher i.e. 4 and more CS.

Table 3, showed that 9 out of 10 women were discharged within 72 hours of the procedures and in table 5 only blood transfusion was significantly associated with the number of CS, $p < 0.001$ This showed that emergency CS is safe for mothers even with multiple repeat procedures.

The baby outcome from this study showed that 7 out of 10 had good APGAR score at 1st minutes which is good record. Correlating to number of CS the higher the number of CS a woman is exposed to the higher the likelihood of baby being admitted to NICU and low 1st minute APGAR, **the $p < 0.001$** in both cases, notwithstanding, emergency CS is safe for the New born in this study.

This study is limited by the small number of cases and other confounding variables that may not have been accounted for such as duration of surgery, indication, gestational age and method of anaesthesia.

Conclusion: Multiple repeat caesarean section is safe for both mother and baby, with relative risk of neonatal intensive care admission for the New born.

Implication: Emergency Obstetrics care services (EmOC) complimented with New born critical care services (NICU) should be strengthened at all maternity care facilities.

REFERENCES

1. Soltanifar S, Russell R. The National Institute for health and clinical excellence (NICE) guidelines for caesarean section, 2011 update: implications for the

- anaesthetist. *Int J Obstet Anesth.* 2012;21(3):264–272
2. E Abalos, V Addo, P Brocklehurst, M El Sheikh, B Farrell, S Gray, P Hardy, E Juszcak, J E Mathews, S Naz Masood, E Oyarzun, J Oyieke, J B Sharma, P Spark Caesarean section surgical techniques: 3 year follow-up of the CORONIS fractional, factorial, unmasked, randomised controlled trial. *Lancet* 2016;388:62–72.
3. Ana Pilar Betrán , Jianfeng Ye, Anne-Beth Moller, Jun Zhang, A. Metin Gülmezoglu, Maria Regina Torloni. The increasing trend in caesarean section rates: global, regional and national estimates: 1990-2014. *PLoS One* 2016;
4. Mylonas I, Friese K: The indications for and risks of elective cesarean section. *Dtsch Arztebl Int* 2015; 112:489–95. DOI: 10.3238/arztebl.2015.0489.
5. World Health Organization Appropriate technology for birth. *Lancet.* 1985;2(8452):436-7.
6. Fahd Mohammed Albejaidi, School of Rural Medicine, University of New England (Australia) *Journal of Alternative Perspectives in the Social Sciences* (2010) Vol 2, No 2, 794-818.
7. World Health Organization WHO recommendations non-clinical interventions to reduce unnecessary caesarean sections. World Health Organization; 2018.
8. Tashfeen K, Patel M, Hamdi IM, Al-Busaidi IH, Al-Yarubi MN. Decision-to-delivery time intervals in emergency caesarean section cases: repeated cross-sectional study from Oman. *Sultan Qaboos Univ Med J.* 2017;17(1)
9. Gholitabar M, Ullman R, James D, Griffiths M. Caesarean section: summary of updated NICE guidance. *BMJ.* 2011;343(nov23 1)
10. Obstetricians ACo, Safety GCoP Improvement Q: ACOG Committee Opinion No. 487: preparing for clinical emergencies in obstetrics and gynecology. *Obstet Gynecol.* 2011;117(4)
11. Soltanifar S, Russell R. The National Institute for health and clinical excellence (NICE) guidelines for caesarean section, 2011 update: implications for the anaesthetist. *Int J Obstet Anesth.* 2012;21(3):264–272

12. Hirani BA, Mchome BL, Mazuguni NS, Mahande MJ. The decision delivery interval in emergency caesarean section and its associated maternal and fetal outcomes at a referral hospital in northern Tanzania: a cross-sectional study. *BMC Pregnancy Childbirth*. 2017;17(1):411.
13. Mishra N, Gupta R, Singh N: Decision Delivery Interval in Emergency and Urgent Caesarean Sections: Need to Reconsider the Recommendations? *The Journal of Obstetrics and Gynecology of India* 2018, 68(1):20–26
14. Kitaw, T. M., Tsegaw Taye, B., Tadese, M., & Getaneh, T. (2021). Effect of decision to delivery interval on perinatal outcomes during emergency cesarean deliveries in Ethiopia: A prospective cohort study. *PloS one*, 16(11).
15. Kitaw, T. M., Limenh, S. K., Chekole, F. A., Getie, S. A., Gameda, B. N., & Engda, A. S. (2021). Decision to delivery interval and associated factors for emergency cesarean section: a cross-sectional study. *BMC pregnancy and childbirth*, 21(1), 224.
16. Hirani, B. A., Mchome, B. L., Mazuguni, N. S., & Mahande, M. J. (2017). The decision delivery interval in emergency caesarean section and its associated maternal and fetal outcomes at a referral hospital in northern Tanzania: a cross-sectional study. *BMC pregnancy and childbirth*, 17(1), 411.
17. Bright Chigbu, Stephen Onwere, Chuks Kamanu, C Aluka, Ogechi Okoro and Emeka Adibe (2009). Pregnancy outcome in booked and unbooked mothers in South Eastern Nigeria. *East African medical journal* 86(6):267-71.
18. Small M, Allen T. Brown HL.92017) Global disparities in maternal mortality and morbidity. *Semen Perinatol* 41(5): 318-322.
19. Mojtaba Akbari, Fahimeh Sabet Zahra Shahshahan, Bahram Heshmati. The correspondence www.thelancet.com vol. 388 july 2016.