



Research Article

Comparison Between Elective Versus Emergency Caesarean Section on Intra Operative Surgical Findings and Feto Maternal Outcomes

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Abstract

Background: The cesarean section is one of the most common operative procedures throughout the world with global rate increasing both developed and developing countries. **Objective:** To compare and evaluate the intraoperative surgical findings on elective versus emergency caesarean section and fetomaternal outcomes. **Methods and materials:** This study was descriptive comparative carried out at obstetrics and gynecology department of Tripoli university hospital during 1st January to 31st March 2023. The selected sample included 130 pregnant women which divided into two groups (65 patients had delivered by elective CS and another 65 patients had delivered by emergency CS). The collected data was entered, coded and analyzed by using SPSS version 25. The P value of less than 0.05 was considered as statistically significant. **Results:** We studied 130 pregnant women who's evaluated and compared the feto maternal outcomes on elective versus emergency caesarean section aged between 21 to 48 years, the mean maternal age among elective CS was 33.46 ± 4.169 SD and the mean maternal age among emergency CS was 32.03 ± 5.598 SD. The main indication of CS had reported was previous caesarean section both for elective and emergency caesarean delivery which accounts (41/63.1%) and (15/23.1%) respectively with highly statistically significant results reported (P – value = 0.000). And on compare the intraoperative surgical findings, the rate of adhesion more prevalent on elective CS while the rate of bleeding was more frequently on emergency CS with statistically significant results (P – value = 0.001 and 0.011) respectively. Although, most of patients (83.1%) did not expressed intra operative complications but 6.9% (9) had hysterectomy (6 of 9 on emergency CS while 3 of 9 on elective CS) and 3.8% (5) had expressed urinary tract injury (3 of 5 on emergency CS while 2 of 5 on elective CS). And 19.2% (25) of neonates had admitted to neonatal intensive care unit which represented 15.3% (20) of them had delivered by emergency CS while 3.9% (5) of them had delivered by elective CS with statistically significant results (P-value=0.001). **Conclusion:** On summary, the raising rate of caesarean section either by elective or emergency manner had significant adverse impacts on feto maternal outcomes with high rate of maternal bleeding, adhesion, abnormal placentation and overall increase risk of neonatal and maternal intensive care unit admission. Therefore, optimal perinatal assessment throughout pregnancy period is essential to reduce rate of unnecessary caesarean section and minimize related morbidity and mortality of caesarean delivery particularly emergency type.

Keywords: Caesarean Section; Intra Operative Surgical Findings; Feto Maternal Outcomes; Libya

Abbreviations: BT = Blood Transfusion; CPD = Cephalopelvic Disproportion; CS = Caesarean Section; LSCS = Lower Segment Caesarean Section; NICU = Neonatal Intensive Care Unit

Introduction:

The caesarean section is one of the most common operative procedures throughout the world with global rate increasing both on developed and developing countries [1]. On determine the maternal factors contributed to CS were previous Lower Segment Caesarean Section (LSCS) and Eclampsia while the fatal factors for CS were cephalopelvic disproportion (CPD) and breech [2,3]. Also, there are various adverse maternal and fatal outcomes linked to caesarean section [3,4]. Several studies had reported rising on intra operative surgical risks and subsequent complications with caesarean delivery such as placenta accrete, hysterectomy, blood transfusion receiving rate, increase on operation time, intensive care unit admission and hospital stay [5,6].

Objective:

To compare and evaluate the intraoperative surgical findings on elective versus emergency caesarean section and fetomaternal outcomes.

Methods and Materials:

This study was descriptive comparative cross-sectional study which carried out at obstetrics and gynecology department of Tripoli university hospital during 1st January to 31th March 2023. The selected sample included 130 pregnant women which divided into two groups (65 patients had delivered by elective CS and another 65 patients had delivered by emergency CS) which collected postoperatively by simple random technique throughout predesigned structural questionnaire during the time period.

Results:

Among 130 pregnant women who’s evaluated and compared the feto maternal outcomes on elective verses emergency caesarean section aged between 21 to 48 years, the mean maternal age among elective CS was 33.46 ± 4.169 SD and the mean maternal age among emergency CS was 32.03 ± 5.598 SD. (Table 1)

Variables (n = 130)	Age on Elective CS	Age on Emergency CS
Mean	33.46	32.03
Median	32.00	32.00
Mode	32	31
Std. Deviation	4.169	5.598
Minimum	25	21
Maximum	45	48

Table 1: Maternal Age of Elective Versus Emergency Caesarean Section Distribution, Tripoli, Libya, 2023.

On determine the obstetrical characteristics on elective CS, 90.7% (59) were multigravida, 89.3% (58) were multiparity, 86.1% (56) were miscarriage rate and 33.8% (22) had previous experience of caesarean section. (Table 2) While on assess the obstetrical characteristics on emergency CS, 69.2% (45) were multigravida, 63.1% (41) were multiparity, 58.4% (38) were miscarriage rate and 40% (26) had previous experience of caesarean section. (Table 2)

Variables (n = 130)	Elective CS	Emergency CS	P – value
Gravidity			
Primigravida	6 (9.3%)	20 (30.8%)	0.002
Multigravida	59 (90.7%)	45 (69.2%)	
Parity			
Nulliparity	7 (10.7%)	24 (36.9%)	0.000
Multiparity	58 (89.3%)	41 (63.1%)	

Miscarriage rate			
Yes	56 (86.1%)	38 (58.4%)	0.000
No	9 (13.9%)	27 (41.6%)	
Previous experience of caesarean section			
Yes	22 (33.8%)	26 (40%)	0.467
No	43 (66.2%)	39 (60%)	

Table 2: Obstetrical Characteristics of Elective Versus Emergency Caesarean Section distribution, Tripoli, Libya, 2023.

Regarding the gestational age at time of delivery, the mean GA on elective CS was 37.86 ± 0.659 SD while mean GA on emergency CS was 36.82 ± 2.214 SD. (Table 3)

Variables (n =130)	GA on elective CS	GA on emergency CS
Mean	37.86	36.82
Median	38	37
Mode	38	38
Std. Deviation	0.659	2.214
Minimum	36	30
Maximum	39	41

Table 3: Gestational Age of Elective Versus Emergency Caesarean Section Distribution, Tripoli, Libya, 2023.

Regarding the blood group (ABO and rhesus) classifications, the most frequent class was A rhesus positive which scored 45.4% (59) followed by O rhesus positive which accounts 28.5% (37). And on compare between elective versus emergency caesarean section on terms of blood group classifications, the A rhesus positive had reported more on elective CS (31 of 59) while O rhesus positive documented on emergency CS (22 of 37). (Figure 1)

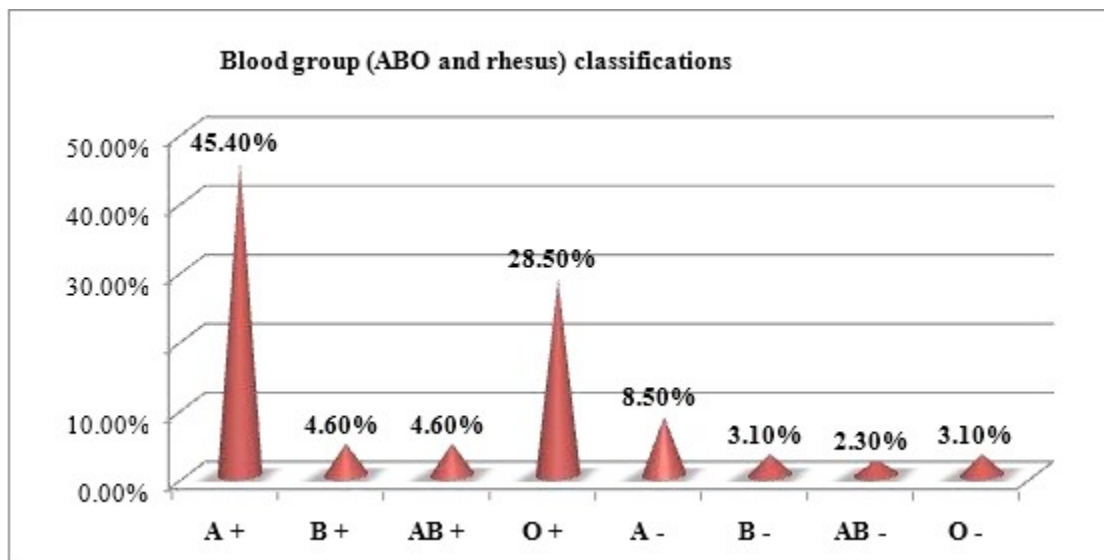


Figure 1: Blood Group (ABO and rhesus) Classifications of Elective Versus Emergency Caesarean Section Distribution, Tripoli, Libya, 2023.

The main indication of CS had reported was previous caesarean section both for elective and emergency caesarean delivery which accounts (41/63.1%) and (15/23.1%) respectively with highly statistically significant results reported (P – value = 0.000). (Table 4)

Variables (n = 130)	Elective CS	Emergency CS
Previous CS	41	15
High Blood pressure	9	5
Breech presentation	3	8
Premature rupture of membrane	0	7
Flat CTG	0	4
Decrease fetal movement	0	4
Abruptio placenta	2	3
Meconium stained liquor	0	3
Multiple pregnancy	0	3
Scanty liquor	0	2
Old age primigravida	3	0
Placenta previa/Placental invasion	1	2
Infertility	5	2
Tender scar	0	2

Diabetes mellitus	0	2
Von Will brand disease	0	1
Human immunodeficiency virus	0	1
Hepatitis B Virus	0	1
Cardiac case with pacemaker	1	0

Table 4: Indications of Elective Versus Emergency Caesarean Section Distribution, Tripoli, Libya, 2023.

And on compare the intraoperative surgical findings, the rate of adhesion more prevalent on elective CS while the rate of bleeding was more frequently on emergency CS with statistically significant results (P – value = 0.001 and 0.011) respectively. 56 of 65 elective CS had adhesion with reported percentage was 86.2% while 9 (13.8%) did not had it 50 of 65 emergency CS had bleeding with documented percentage was 76.9% while 15 (23.1%) did not had it. Also, the rate of varicosity was more on emergency CS which accounts 20% (13 of 65) while 6.1% (4 of 65) among elective CS. Also, the abnormal placental invasion and placental lesions were highly reported on emergency CS 10.7% (7 of 65) while 4.6% (3 of 65) on elective CS. Although, most of patients (83.1%) did not expressed intra operative complications but 6.9% (9) had hysterectomy (6 of 9 on emergency CS while 3 of 9 on elective CS) and 3.8% (5) had expressed urinary tract injury (3 of 5 on emergency CS while 2 of 5 on elective CS). (Table 5)

Variables (n = 130)	Elective CS	Emergency CS
No complications	57	51
Hysterectomy	3	6
Urinary tract injury	2	3
Coagulopathy	2	0
Bowel injury	0	2
Uterine rupture	0	2
Severe bleeding	1	1

Table 5: Intraoperative Complications of Elective Versus Emergency Caesarean Section distribution, Tripoli, Libya, 2023.

On assessed the feto maternal outcomes, 21.5% (28) had admitted to maternal intensive care unit with equal results reported both for elective CS (14/10.75%) and emergency CS (14/10.75%) which revealed highly statistically significant results (P – value = 0.000). And 16.2% (21) of patients had received blood transfusion which documented to be frequent on emergency CS was 9.3% (12 of 21) on compare to elective CS was 6.9% (9 of 21) with statistically significant results between blood transfusion and types of caesarean section (P – value = 0.004). (Figure 2 – Table 6)

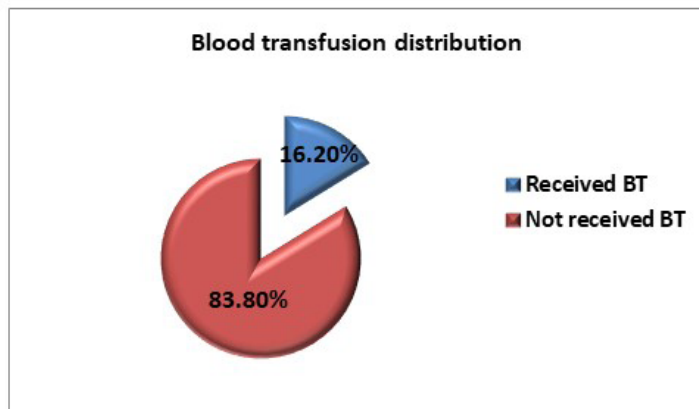


Figure 2: Blood Transfusion of Elective Versus Emergency Caesarean Section Distribution, Tripoli, Libya, 2023.

Variables (= 130)	Elective CS	Emergency CS	Total
Received BT	9 (6.9%)	12 (9.3%)	21 (16.2%)
Not received	56 (43.1%)	53 (40.7%)	109 (83.8%)
(P – value = 0.004)	65 (50%)	65 (50%)	130 (100%)

Table 6: Blood Transfusion of Elective Versus Emergency Caesarean Section Distribution, Tripoli, Libya, 2023.

Regarding the neonatal status at time of delivery, majority of them were alive 86.9% (113) while just 13.1% (17) of newborns had died which 9.3% (12 of 17) had delivered by emergency CS while 3.8% (5 of 17) had delivered by elective CS with statistical insignificant results (P value = 0.069). (Figure 3 – Table 7)

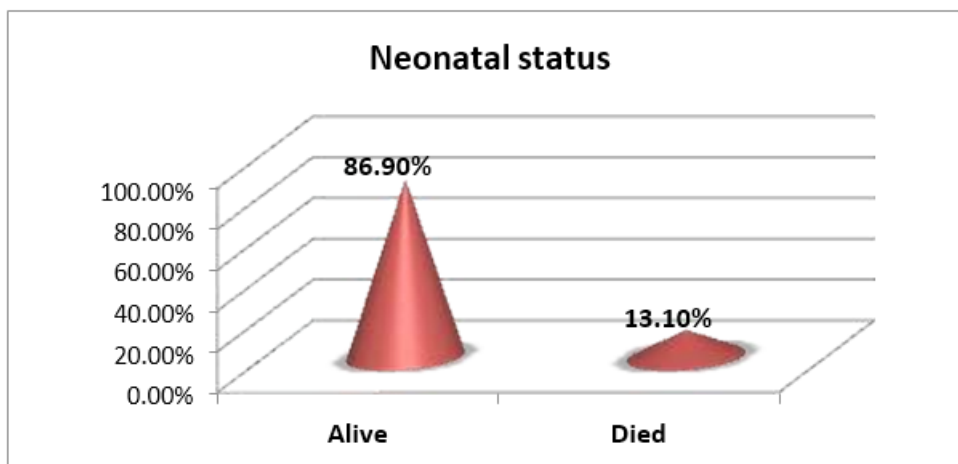


Figure 3: Neonatal status of elective versus emergency caesarean section distribution, Tripoli, Libya, 2023.

Variables (= 130)	Elective CS	Emergency CS	Total
Alive	60 (46.2%)	53 (40.7%)	113 (86.9%)
Died	5 (3.8%)	12 (9.3%)	17 (13.1%)
(P – value = 0.069)	65 (50%)	65 (50%)	130 (100%)

Table 7: Neonatal status of elective versus emergency caesarean section distribution, Tripoli, Libya, 2023.

And 19.2% (25) of neonates had admitted to neonatal intensive care unit which represented 15.3% (20) of them had delivered by emergency CS while 3.9% (5) of them had delivered by elective CS with statistically significant results (P – value = 0.001). (Figure 4 – Table 8)

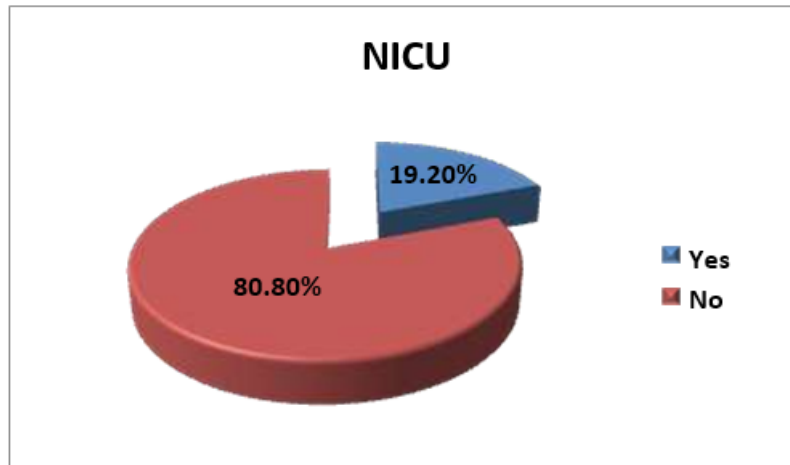


Figure 4: Neonatal Intensive Care Unit of Elective Versus Emergency Caesarean Section distribution, Tripoli, Libya, 2023.

Variables (= 130)	Elective CS	Emergency CS	Total
Admitted to NICU	5 (3.9%)	20 (15.3%)	25 (19.2%)
Not admitted to NICU	60 (46.1%)	45 (34.7%)	105 (80.8%)
(P value = 0.001)	65 (50%)	65 (50%)	130 (100%)

Table 8: Neonatal Intensive Care Unit of Elective Versus Emergency Caesarean Section distribution, Tripoli, Libya, 2023.

Regarding the neonatal complications, 83.8% (109) of them did not had complications but 6.2% (8) had preterm birth delivered by emergency CS and 1.5% (2) had both fetal distress and congenital anomaly delivered by elective CS. (Table 9)

Variables (n = 130)	Elective CS	Emergency CS
No complications	61	48
Preterm birth	0	8
Fetal distress	2	3
Congenital anomaly	2	3
RDS	0	1
Birth asphyxia	0	1
Necrotizing enterocolitis	0	1

Table 9: Neonatal Complications of Elective Versus Emergency Caesarean Section distribution, Tripoli, Libya, 2023.

Of note, the overall statistical rate distribution of elective versus emergency CS on January, February and March 2023 at obstetrics and gynaecology department of Tripoli university hospital was 70.2% (737) of them had delivered by caesarean section which divided into 43.8% (323) for elective CS versus 56.2% (414) for emergency CS. (Figure 5 - 6)

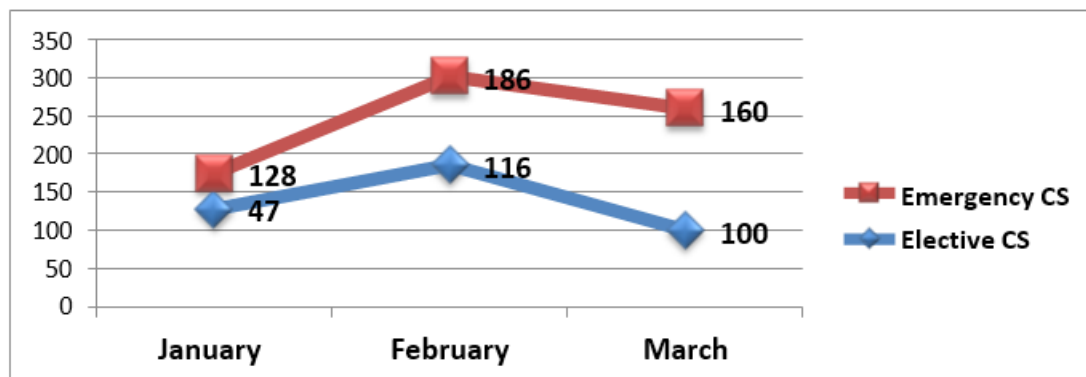


Figure 5: Overall Caesarean Section Trends Over January, February and March 2023 Distribution, Tripoli, Libya, 2023.

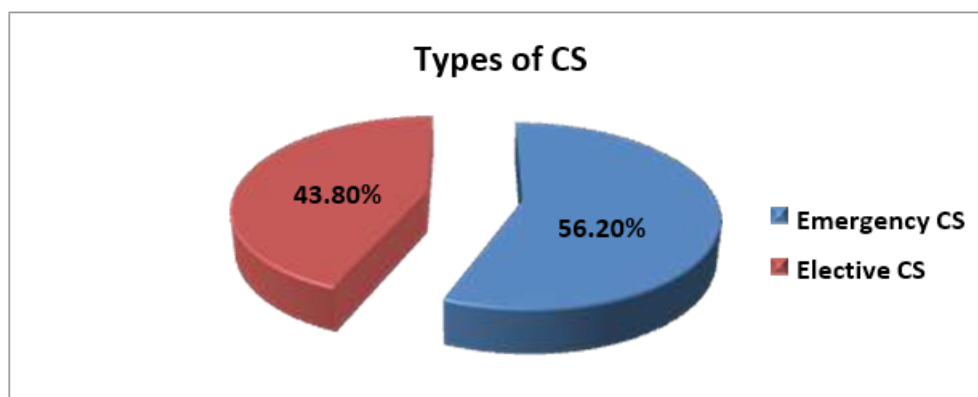


Figure 6: Overall Elective Versus Emergency Caesarean Section Over January, February and March 2023 Distribution, Tripoli, Libya, 2023.

Discussion:

We studied 130 pregnant women which evaluated and compared the feto maternal outcomes among elective versus emergency caesarean section. The most frequent indication on present study was previous CS for both elective and emergency CS, our study consistent with several studies and literature review [7-10]. On recent study in Ethiopia (2023) had reported that the intra-operative surgical complications was accounts 10.7% of overall caesarean delivery with documented complications were bleeding 3.6% (18), incision extension 1.4% (7) and adjacent internal organ injury 0.2% (1) [11]. Also, this study had reported that the rate of maternal complications were three times more frequent among emergency delivery on compare to elective delivery [11]. On Al-Zirqi, *et al* study (2008) had revealed that rate of severe obstetrical haemorrhage linked significantly with emergency delivery as present study [12]. And the rate of blood transfusion was higher on patients had severe anaemia particularly on haemoglobin less than 9.5 g/dl which had significant risks as reported by Ehrenthal, *et al* study (2012) [13]. In recent systematic review (2022) had reported that the overall total numbers of relevant study were 312 bladder injures and 7 ureteric injuries with mean injury rates documented were 267 and 9 events per 100,000 cases respectively [14]. And most of these injuries occurs secondary to caesarean section and hysterectomy [15-17]. The presence of adhesions among repeated CS had reported to be correlated with CS techniques difficulty which attributed to longer the operation time of delivery as well as bladder injury risks, on our study the rate of adhesion documented to be higher on elective CS than emergency CS [18-25]. Various studies had reported that the fetal complications such as prematurity, birth asphyxia, respiratory morbidity and neonatal intensive care unit admission were higher on emergency CS group on compare to elective CS group, this result corresponding and consistent to our study [7,26-28].

Only controversy old study by Miller *et al.* (1992) had documented opposite results [29]. Similarly, on Darnal N *et al* study (2020) had reported that the rate of maternal and fetal complications were higher on emergency caesarean section on compare to elective caesarean section [30]. Limitation of study, short period of time as well as the reported intra operative surgical findings such as adhesion and bleeding are subjective variables depend on obstetrician side view and surgical experience. Strength of study, adequate sample size which represents the study population on one of biggest tertiary hospital on Tripoli-Libya that can be generalized our results findings.

Conclusion:

On summary, the raising rate of caesarean section either by elective or emergency manner had significant adverse impacts on feto maternal outcomes with high rate of maternal bleeding,

adhesion, abnormal placentation and overall increase risk of neonatal and maternal intensive care unit admission. With increasing rate of hysterectomy, urinary tract injury, neonatal complications and neonatal intensive care unit admission among emergency caesarean section delivery on compare to elective caesarean section. Therefore, optimal perinatal assessment throughout pregnancy period is essential to reduce rate of unnecessary caesarean section and minimize related morbidity and mortality of caesarean delivery particularly emergency type.

References:

1. World Health Organization Human Reproduction Programme WHO Statement on Caesarean Section Rates (2015) *Rep Health Matters* 23:149-150.
2. Thakur V, Chihheriya H, Thakur A, Mourya S (2015) Study of maternal and fetal outcome in elective and emergency caesarean section. *Int J Med Res Rev* 3: 15.
3. Suwal A, Shrivastava VR, Giri A (2013) Maternal and fetal outcome in elective versus emergency cesarean section. *J Nepal Med Assoc* 52: 563-6.
4. Darnal N, Dangal G (2020) Maternal and Fetal Outcome in Emergency versus Elective Caesarean Section. *J Nepal Health Res Council* 18: 186-189.
5. Silver RM, Landon MB, Rouse DJ, Leveno KJ, Spong CY *et al.* (2006) National Institute of Child Health and Human Development Maternal-Fetal Medicine Units Network. Maternal morbidity associated with multiple repeat cesarean deliveries. *Obstet Gynecol* 107: 1226-32.
6. Marshall NE, Fu R, Guise JM (2011) Impact of multiple cesarean deliveries on maternal morbidity: a systematic review. *Am J Obstet Gynecol* 205: 262. e1-8.
7. Elvedi-Gasparović V, Klepac-Pulanić T, Peter B (2006) Maternal and fetal outcome in elective versus emergency caesarean section in a developing country. *Coll Antropol* 30: 113-8.
8. Ali M, Hafeez R, Ahmad M (2005) Maternal and fetal outcome; comparison between emergency caesarean section versus elective caesarean section. *Prof Med J* 12: 32-9.
9. McCarthy FP, Rigg L, Cady L, Cullinane F (2007) A new way of looking at Caesarean section births. *Aust N Z J Obstet Gynaecol* 47: 316-20.
10. Notzon FC, Cnattingius S, Bergsjø P, Cole S, Taffel S, *et al.* (1994) Caesarean section delivery in the 1980s: international comparison by indication. *Am J Obstet Gynecol* 170: 495-504.
11. Alemu H, Yigzaw ZA, Asrade L, Nega B, Belachew A *et al.* (2023) Proportion and associated factors of maternal complications of cesarean sections among mothers who deliver at Bahir Dar City Public Specialized Hospitals, Bahir Dar, Ethiopia. *BMC Womens Health* 23: 237.
12. Al-Zirqi I, Vangen S, Forsen L, Stray-Pedersen B (2008) Prevalence and risk factors of severe obstetric haemorrhage. *BJOG An Int J Obstet Gynaecol* 115: 1265-1272.
13. Ehrenthal DB, Chichester ML, Cole OS, Jiang X (2012) Maternal Risk Factors for Peripartum Transfusion. *J Womens Health (Larchmt)* 21: 792-7.

14. Wei G, Harley F, O'Callaghan M, Adshead J, Hennessey D, et al. (2023) Systematic review of urological injury during caesarean section and hysterectomy. *Int Urogynecol J* 34: 371-389.
15. Mariotti G, Natale F, Trucchi A, Cristini C, Furbetta A, et al. (1997) Ureteral injuries during gynecologic procedures. *Minerva Urol Nefrol* 49: 95-98.
16. Symmonds RE (1976) Ureteral injuries associated with gynecologic surgery: prevention and management. *Clin Obstet Gynecol* 19: 623-44.
17. Dowling R, Corriere J, Jr, Sandler C (1986) Iatrogenic ureteral injury. *J Urol* 135: 912-915.
18. Morales KJ, Gordon MC, Bates GW Jr (2007) Postcesarean delivery adhesions associated with delayed delivery of infant. *Am J Obstet Gynecol* 196: 461.e1-6.
19. Greenberg MB, Daniels K, Blumenfeld YJ, Caughey AB, Lyell DJ et al. (2011) Do adhesions at repeat cesarean delay delivery of the newborn? *Am J Obstet Gynecol* 205: 380.e1-5.
20. Tulandi T, Agdi M, Zarei A, Miner L, Sikirica V et al. (2009) Adhesion development and morbidity after repeat cesarean delivery. *Am J Obstet Gynecol* 201: 56. e1-6.
21. Rossouw JN, Hall D, Harvey J (2013) Time between skin incision and delivery during cesarean. *Int J Gynaecol Obstet* 121: 82-5.
22. Pearson GA, Mackenzie IZ (2013) Factors that influence the incision-delivery interval at caesarean section and the impact on the neonate: a prospective cohort study. *Eur J Obstet Gynecol Reprod Biol* 169: 197-201.
23. Gungorduk K, Ascioglu O, Celikkol O, Sudolmus S, Ark C et al. (2010) Iatrogenic bladder injuries during caesarean delivery: a case control study. *J Obstet Gynaecol* 30: 667-70.
24. Rahman MS, Gasem T, Al Suleiman SA, Al Jama FE, Burshaid S et al. (2009) Bladder injuries during cesarean section in a University Hospital: a 25-year review. *Arch Gynecol Obstet* 279: 349-52.
25. Phipps MG, Watabe B, Clemons JL, Weitzen S, Myers DL et al. (2005) Risk factors for bladder injury during cesarean delivery. *Obstet Gynecol* 105: 156-60.
26. Benzouina S, Boubkraoui Mel-M, Mrabet M, Chahid N, Kharbach A et al. (2016) Fetal outcome in emergency versus elective cesarean sections at Souissi Maternity Hospital, Rabat, Morocco. *Pan Afr Med J* 23: 197.
27. Najam R, Sharma R (2013) Maternal and fetal outcomes in elective and emergency caesarean sections at a teaching hospital in North India: A retrospective study. *JARBS* 5: 509.
28. Onankpa B, Ekele B (2009) Fetal outcome following cesarean section in a university teaching hospital. *J Natl Med Assoc* 101: 578-81.
29. Miller M, Leader LR (1992) Vaginal delivery after caesarean section. *Aust N Z J Obstet Gynaecol* 32: 213-6.
30. Darnal N, Dangal G (2020) Maternal and Fetal Outcome in Emergency versus Elective Caesarean Section. *J Nepal Health Res Counc* 18: 186-189.