MATERNAL AND FETAL OUTCOMES IN EMERGENCY VERSUS ELECTIVE TWO OR MORE PREVIOUS CAESAREAN DELIVERIES

***Faris A Rasheed, CABOG**Thikra Najim, F.I.C.O.G ***Yousif A AL-Raheem, FICMS-CM**

Abstract

Background: Women with previous two or more caesarean deliveries are usually managed by elective cesarean section to avoid the possible risks of labor**.**

Objective: To compare the relative risks of maternal and fetal outcomes in emergency versus elective previous two or more caesarean deliveries

Design: Randomized prospective clinical study

Setting: Al-Elweya Maternity Teaching Hospital, from 1st of March to 31st of September 2008.

Methods: The study groups, those who had previous two or more caesarean deliveries, were included from the hospital admissions. The 1st group (102 women) presented in labor and was managed by caesarean delivery as soon as it was possible. The second group (78 women) was admitted for elective cesarean delivery.

The main maternal outcomes were intra operative complications, including hysterectomy, scar dehiscence, bladder injuries, uterine and internal iliac arteries ligation, and blood transfusion. Postoperative maternal outcomes were severe morbidity including bleeding, fever, urinary tract infection, blood transfusion, the need to Intensive Care Unit admission and readmission. The fetal outcomes measures were Apgar score at one and five minutes, respiratory distress syndrome (RDS), admission to the neonatal intensive care unit and fetal loss up to hospital discharge.

Results: Both groups were comparable in demographic, social and past obstetric history characteristics. Intra operative complications showed significant difference in bowel adhesions (RR 0.35, 95% CI 0.14- 0.88), and blood transfusion (RR 0.51, 95% CI 0.28-0.94). There was statistical significant difference in the mobilization time 7.2 hours and 9.3 hours in emergency and elective groups respectively (p= 0.0009), also in feeding time, it was shorter after emergency caesarean section (P=0.0224), and in the hospital stay 24.6 and 32.6 hours respectively (p=0.0001). There was no statistical difference in post operative complications. Fetal outcomes showed no statistical significant difference in fetal loss, respiratory distress and readmission.

Conclusion: Women with previous two or more caesarean deliveries can wait until starting labor for doing cesarean delivery without increasing risks to the mother and fetus.

Key words: Emergency caesarean section, elective caesarean section, intra-operative complications.

Introduction:

Caesarean delivery represents the most important operation in obstetrics. The increasing rate does not seem to improve the overall fetal outcome but is linked with increased morbidity,[1] although with cephalic presentation, there was a trend towards a reduced odds ratio for fetal death with elective caesarean section, after adjustment for confounding variables and gestational age.[2] One third or more caesarean deliveries are usually done electively.[3] In our practice, a lot of women with previous two or more caesarean deliveries are admitted in labor and had emergency caesarean deliveries. In Elweyia Maternity Teaching Hospital – Baghdad, with caesarean delivery rate of 43 %, repeated two or more cesarean deliveries account for about 25% of the caesarean deliveries, the intrapartum or emergency ones represents 55 %.

The aim of this study is to compare the maternal and fetal outcomes in intrapartum versus elective two or more previous caesarean deliveries.

Methods:

This prospective study was conducted during the period from 1st of March to the 31st of September 2008 in Al-Elweyia Maternity Teaching Hospital – Baghdad after taking the approval from the hospital authority. Participating women were those attending the hospital in that period. Informed consent was taken from each eligible woman.

The eligibility criteria were women with previous two or more cesarean deliveries. The elective group consisted of 78 women admitted mainly from the specialist morning outpatient clinic. While the emergency group composed of 102 women admitted from the morning and the 24 hours outpatient clinic run by the registrars on duty. All women in both groups received prophylactic antibiotics soon after operation using cefatoxim 1gm intravenously and another 1gm just before discharge. All women in both groups have their operation done under general anesthesia. The duration of operation was measured from starting skin incision to complete closure of the skin. The methods of operative procedure of cesarean section was as follows, the uterus was closed in two layers outside the skin incision, no closure of pelvic and parietal peritoneum, approximation of the rectus muscle is done, rectus sheath is closed by nylon, only cauterization done in the subcutaneous tissue, and the skin was closed by subcuticular nylon.

Data collection

Data were collected on a special questionnaire by the specialist doctor or the registrar; each patient was followed from admission to hospital discharge. The neonate was also assessed by a pediatrician and followed if was admitted to the neonatal intensive care unit.

Definition of outcomes

Caesarean deliveries were classified as elective if the operation was decided by the specialist before the onset of labor and usually they were referred from the hospital specialist outpatient clinic. Emergency cesarean deliveries were considered when the patients were admitted in labor as judged by the specialist on duty (regular contractions with cervical dilatation). We exclude emergency caesarean deliveries without labor.

The maternal outcomes were intrapartum severe complications which include maternal death, hysterectomy, and dehiscence of scar, severe bladder adhesions, bladder injury, bowel injury, bleeding and blood transfusion. The postpartum maternal outcomes were maternal death, high fever, bleeding, UTI, blood transfusion, duration of hospital stay. The duration between operation and starting feeding and mobilization were also recorded.

Hysterectomy was decided by the most senior specialist on duty after considering other treatment options. Dehiscence is reported when part of the membranes is protruded through the uterine incision of the previous cesarean sections. Severe bladder adhesions were considered if it was very difficult to dissect the bladder. Bleeding was reported severe when exceeding 500 ml by packs assessment. Blood transfusion was carried out according to the patient's condition decided by the anesthetist on charge.

Postoperatively, temperature of 38 degree centigrade was considered significant. Time interval between operation and starting mobilization and oral feeding was reported by resident doctor on duty. Any bleeding more than usual was considered significant. Blood transfusion is ordered by the specialist obstetrician in charge of the patient according to the patient's condition and if the hemoglobin is

less than 9gm/100ml the patients are usually discharged after 24 hours postoperatively unless the patient request more time or her condition needed that.

Fetal outcomes were fetal death in utero plus fetal death in the neonatal intensive care unit up to discharge. Abgar score is measured by a pediatrician at one and five minutes. Admission to the NICU is ordered also by the pediatrician. Convulsion is only considered when occurred in the hospital. No further follow up of neonates were done after discharge from the hospital with the mother or from the NICU.

Statistical analysis

Analysis of collected data was done by using:

Descriptive statistics (frequencies and percentages)

Inferential statistics (X^2-test &t-test), p-value less than 0.05 considered to be statistically significant.

Relative risk (RR) is used to compare the risk of developing the outcomes (maternal and fetal complications) in elective CS versus Emergent Cs

RR=incidence of complications in elective CS/ incidence of complications in emergent CS. The confidence interval (CI) around the RR is also calculated using the formula: $CI=Log(RR)\pm SE \mathbf{X} Z_{\alpha}$

Results:

The means age of the study groups were 28.34 (±6.56) years for emergency CS women and 29.88 (±8.86) years for elective CS women respectively. The difference was statistically not significant (P value= 0.1819). The other socio-demographic criteria are shown in table 1, It was comparable with no statistical significant difference in age, parity, education, occupation and area of residency.

The means parity of the study groups were 3.28 (±2.42) years for emergency CS women and 2.76(±1.98) years for elective CS women respectively. The difference is statistically not significant (P value= 0.1246). The other past medical and obstetrical conditions are shown in table 2.

Both groups had irregular antenatal visits, these included sporadic visits to a private doctor or hospital outpatient clinic.

There was no statistical significant difference between the two groups regarding the place from which they are referred. The time of surgery was comparable between the two groups (32.3 versus 45.4 minutes) in emergency and elective groups respectively.

Regarding intra operative complications, there was no maternal mortality. Table-3 showed that both groups the emergency and elective were comparable in the following complications with no statistical significant difference: two patients in the emergency group had hysterectomy and patients in the elective group(relative risk" RR" of 0.31, confidence interval " CI" 95% , 0.06-1.53). Bleeding with arelative risk of 1.05, CI 0.44-2.49, dehiscence and rupture with RR of 0.59, CI 0.23-1.53, severe bladder adhesions with RR of 0.50, CI 0.15-1.74, bowel injury with RR of 0.35, CI 0.14-0.88, bladder injury RR of 0.76, CI 0.05-12.03, uterine artery ligation RR of 0.56, CI 0.23-1.32, internal iliac artery ligation RR of 0.44, CI 0.13-1.44.

There was significant difference in blood transfusion with RR of 0.51, CI 0.28-0.94, in emergency and elective groups respectively.

Table -4 showed the post operative maternal complications, the time interval of mobilization and feeding were significantly shorter in the emergency group than in the elective group with the P value of 0.0001, 95% CI, and 0.0224 respectively. There was also significant statistical difference in hospital post operative stay especially more than 48 hours (12 patients in the emergency group versus 18 in the elective group) with RR= 0.5 for emergency to elective groups. The time interval between operation and feeding was less in the emergency group than in the elective group, 6.1 to 8.7 hours respectively (P value= 0.0224, 95% CI, -4.826 to -0.373).

There were no statistical significant differences in the other post operative complications which include severe vomiting, fever, bleeding, severe abdominal pain, blood transfusion, the need for ICU, and

readmission to hospital as shown in table 6. There was no materal death.

Table-7 showed the fetal conditions and complications of the emergency and the elective groups, there were no statistical significant differences in the Apgar score at one and five minutes, RDS, convulsion, stillbirth, admission to INCU and neonatal death up to hospital discharge.

Discssion

The timing of elective delivery is one of the dellimas in obstetrics, too early delivery may lead to neonatal problems, and unexpected antepartum stillbirth, although tragic, is not uncommon and increased 8-fold from 0.7 per 1000 on-going pregnancies at 37 weeks to 5.8 per 1000 on-going pregnancies at ≥ than 43 weeks.[4] There is good evidence demonstrating that, in the immediate postnatal period, respiratory function is more likely to be compromised in infants delivered by elective cesarean delivery.[5] From the maternal side it is well known that all cesarean deliveries whether elective or emergency, prelabor or intrapartum are associated with more morbidity and mortality and less satisfacion than vaginal delivery, the ratio of risk corrected for the reasons for the caesarean section are approximately 5:1 caesarean versus vaginal deliveries, and 1.5: 1 for emergency intrapartum versus elective caesarean section.[6] Women with previous two or more caesarean sections are usually scheduled for elective procedure in our hospital practice, but for many reasons good number of these women are presented in labor, even they know that they need cesarean delivery. That is mostly due to difficulty in having appointment for the elective delivery, for the overload on the consultant hospital outpatient clinic as. Other factors may play a part like intended vaginal delivery and unawareness of the risks of contraction on the previous scar, all these shaded by the poor socio-economic status and poor education.

Women undergoing caesarean deliveries either intrapartum or elective, independent of demographic and clinical characteristics or experience of pregnancy had double the risk for severe maternal morbidity and mortality and up to five times the risk of postpartum infection compared with women undergoing vaginal delivery.[7] Labor and rupture membranes before spontaneous labor before an elective cesarean delivery also reduced the fetal risk associated with this mode of delivery.

In our study, the gestational age according to the last menstrual period was slightly nlower in emergency than the elective group (37.2 and 37.9 weeks) respectively but showed no statistical significant difference (P=0.0832).In the emergency group women wait until labor started for either they think that it is more natural, or they fail to have appointment for elective delivery and can afford for private delivery Although the figures were comparable, but the inclusion of preterm deliveries presented before 37 weeks decreased the gestational age of the emergency group, but still the starting of labor reflect fetal maturity and more physiological ending of pregnancy. Elective caesarean delivery could increase neonatal morbidity and mortality because lack of labor affects the physiological process for initiation of respiration.The mean in the elective group was below 38 weeks because of the difficulty of taking appointments which are suitable for the patient and their specialist doctors, for each specialist has elective operations list in one day of the week. Recent data showed better fetal outcome if elective caesarean delivery is done at 39 weeks of gestation.[8] In a recent study study elective caesarean deliveries with no indicated risk were significantly associated with neonatal mortality (1.6 to 2.6) thus supporting the concept that caesarean delivery has a true biological effect.[9]

In both groups there were no maternal mortality intra and post operatively. To compare for complications we concentrate on severe morbidity.We also put a special follow up system to register any maternal readmission although we may missed some of them, for the diificulty in follow up documentation.

The duration of operations were comparable in both groups, it was slightely shorter in the emergency group (32.3 minutes versus 43.4 minutes) which did not reach statistical significant difference. The elective operations

were mostly done by the specialists and it seems that the registrars are faster than their seniors in doing cesarean deliveries.

The intraoperative complications showed only statistical significant differences in blood transfusion (RR of 0.51) which was more in the elective group.This may be explained by more uterine atony in the elective group.

Compairing our figures with guidelines compandum of the RCOG, 2007,[10] hysterectomy was done in 0.7 to 0.8%, versus 2 and 2.5% in our emergency and elective groups respectively, bladder injury, 0.15 versus 1.0 and 1.3% respectively. The increased figures for hysterectomy may be explained by shortage of other treatment options for bleeding or no available vascular surgeons to do internal iliac ligation at the time of surgery. The increased in blood transfusion in the elective group may be due to increased incidence of atony because starting labor in the emergency group lead to better contractions of the uterus during and post operatively

The dehescence of the scar was high in both groups, 6.9 and 11.5 % in the emergency and the elective groups respectively, compared with the RCOG compandom (4.0%), but not reaching statistical significant difference between the two groups.

Post operratively there was a significant difference in the mobilization and feeding time , less in the emergency group (P= 0.0009) and (P=0.0224) respectively. The mean duration to discharge was less in the emergency group (24.6 vessus 32.6 hours than in the elective group.(p= 0.0001).it is difficult to explain why the elective group choose to stay longer in the hospital , it may be due to the type of their personalities , they are overconscios about their health and request more time.

Regarding postoperative complications, there were no statistical significant difference between the two studied gruops Urinary tract infection occured in 6.9 and 6.4% in emergency and elective groups respectively, and it is comparable to the figure of 2 to 16% reported in many studies.[11]

Fetal outcomes showed no statististical significant difference between the two groups, these include the short term conditions and complications . We concentrate on the fetal loss in utero and during admission in the NICU, we feel that if we exclude preterm deliveries from the emergency group , the gestational age will be elevated in this group and this will give some difference in the fetal outcomes. Delaying delivery to 39 weeks or more have better fetal outcome , 48% of cases of adverse outcomes might have been prevented,[8]although some data showed less fetal complications in the elective group.[6]

In conclusion women with previous 2 or more caesarean deliveries can wait until labor started without additional adverse effect on the mother and fetus.

References

1. Jose Villar, GuillermoCarroli, Nelly Zavaleta, Allan Donner, Daniel Wojdyla, Anibal faudes,et al. Maternal and neonatal individual risks and benefits associated with caesarean delivery: multicentre prospective study. BMJ Middle East January 2008; 15: 89- 93.
2. Villar J, Valladares E, Wojdyla D, Zabaleta N, Carroli G, Velazco A,et al. Caesarean delivery rates and pregnancy outcomes : the 2005 WHO global survey on maternal and perinatal health in Latin America. Lancet 2006;367:1819-29.
3. Howell C J. Epidural vrsus non epidural analgesia for pain relief in labor. Cochrane Review in; the Cochrane Hirary, issue 3; Oxford; update software (2002).
4. Hilder L, Costeloe K, Thilaganathan B. Prolonged pregnancy: evaluating gestation specific risks of fetal and infant mortality. Br J Obstet Gynaecol 1998; 105; 169-173.
5. Morrison J J, Rennie J M, Milton P J. Neonatal respiratory morbidity and mode of delivery at term: influence of timing of elective caesarean section. Br J Obstet Gynaecol 1995; 102: 101-106.
6. Lilford R J, Van Coeverden deGroot H A, Moore P J, Bengham P. The relative risks of caesarean section (intrapartum and elective) and vaginal delivery : a detailed analysis to exclude the effects of medical disorders and other acute preexisting physiological disturbances. Br J Obstet Gynaecol 1990; 97: 883-892.

Table 1: Socio-demographic characteristics of the study groups.

criteria	Emrg CS(n=102)		Elective Cs(n=78)		P value (X2 test)
	No	%	No	%	
Education					
Illiterate	15	14.7	7	9.0	
Primary	45	44.1	38	48.7	0.687
Secondary	36	35.3	29	37.2	
College	6	5.9	4	5.1	
Occupation					
Housewife	63	61.8	46	59.0	
Government employee	25	24.5	19	24.3	0.855
Non-gov employee					
	14	13.7	13	16.7	
Residence					
urban	78	76.5	59	75.6	
rural	24	23.5	19	24.4	0.897

Table – 2 Distribution of women regarding their past obstetrical and medical history

Criteria		Em gp(n=102)		El gp(n=78)		P value
		No	%	No	%	(X2 test)
Abortion	**0**	59	57.9	52	66.7	0.343
	1-2	39	38.2	25	32	
	>3	4	3.9	1	1.3	
IUD	**0**	62	60.3	48	61.5	0.944
	1-2	35	34.8	27	34.6	
	>3	5	4.9	3	3.9	
Surgical complications	**yes**	18	17.6	11	14.1	0.522
	No	84	82.4	67	85.9	

Table-3 ANC and referral histories of the study groups

Criteria		Emerg gp(n=102)		El gp(n=78)		P value (X2 test)
		No	%	No	%	
ANC	No	23	22.5	20	25.6	0.581
	Irreg	47	46.1	39	50.0	
	Reg	32	31.4	19	24.4	
Referred by						0.960
Government		54	52.9	41	52.6	
Private		48	47.1	37	47.4	

Table 4: Fetal age at time of operation

Method of calculation	Em gp (n=102) wks mean(+ SD)	El gp(n=78) wks mean(+ SD)	P value (t test)
LMP	37.2 (1.243)	37.9(1.834)	0.0832
US	37.4 (1.457)	37.3(1.32)	0.6353

Table-5: Surgical complications

Surgical complications	Emergency gp(n=102		Elective gp(n=78)		RR(95% CI)
	No	%	No	%	
Bleeding	11	10.8	8	10.2	1.05(0.44-2.49)
Dehiscence	7	6.9	9	11.5	0.59(0.23-1.53)
Bladder adhesions	4	3.9	6	7.7	0.50(0.15-1.74)
Bowel injury	0		0		
Bladder injury	1	1.0	1	1.3	0.76(0.05-12.03)
Uterine artery ligation	8	7.8	11	14.1	0.56(0.23-1.32)
Internal iliac artery ligation	2	1.9	3	3.8	0.44(0.13-1.44)
Hysterectomy	2	2.0	2	2.5	0.31(0.06-1.53)
Blood transfusion	14	13.7	21	26.9	0.51(0.28-0.94)*

Table-6 Maternal postoperative conditions and complications

crireria	Emergency gp(n=102) Mean+-SD		Elective gp(n+78} Mean+-SD		95% CI
Feeding time (hrs)	6.1(6.792)		8.7(8.34)		-4.826 to -0.373 P=0.0224
Mobilization time (hrs)	7.2(4.56)		9.3(3.46)		-3.323 to -0.877 P=0.0009
Hospital stay (hrs)	24.6(9.62)		32.6(8.342)		-10.697to-5.302 P=0.0001
vomiting	8	7.8	7	8.9	0.87(0.33-2,30)
fever	12	11.8	8	10.3	1.15(0.49-2,67)
Abdominal pain	14	13.7	11	14.1	0.97(047-2.02)
UTI	7	6.9	5	6.4	1.07(0.35-3.24)
Blood transfusion	8	7.8	10	12,8	0.61(0.25-1.48)
Admission to ICU	3	2.0	4	5.1	0.57(0.13-2.49)
Readmission	6	5.9	8	10.3	0.57(0.21-1.58)

Table-7 fetal complications

Fetal complications	Emergency gp(n=102)		Elective gp(n=78)		RR(95% CI)
	No	%	No	%	
Stillbirth+neonatal death up to discha	3	2.8	3	3.8	0.84(0.75-1.65) P > 0.78
Wt <3Kg	68	66.7	56	71.8	0.93(0.76-1,13)
≥ 3 Kg	34	33.3	22	28.2	1.28(0.75-1.85) P=0.461
AS 1 min ≥7	89	87.3	62	79.5	1.09(0.96-1.26)
<7	13	12.7	16	20.5	0.62(0.32-1.20) P=0.16
AS 5 min ≥7	92	90.2	65	83.3	1.08(0.96-1.22)
<7	10	9.8	13	16.7	0.59(0.27-1.27} P=0.172
RDS	5	4.9	8	10.3	0.48(0.16-1.40)
Thick meconium	7	6.7	4	5.1	1.34(0.41-4.41)
Jaundice	11	10.8	9	11.5	0.93(0.40-2.14)
fever	6	5.9	9	11.5	0.51(0.19-1.37)
Convulsion	3	2.9	1	1.3	2.29(0.24-9.63)
Neonatal ICU admission	19	18.6	11	14.1	1.32(0.67-2.61)
Readmission	6	5.9	10	12.8	0.46(0.17-1.21)