

The Correlation between Decision-To-Incision Time with Maternal and Neonatal Clinical Outcomes on Cesarean Sections

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Volume 1 Issue 1 - 2018

Received Date: 14 June 2018

Accepted Date: 25 June 2018

Published Date: 6 July 2018

2. Keywords

Cesarean section; Perinatal clinical outcomes; Maternal clinical outcomes

1. Abstract

1.1. Aim: The aim of this research study is to evaluate and assess whether the delivery decision till performance of incision time interval in cesarean mode of deliveries is correlated with variability in maternal and neonatal clinical outcomes.

1.2. Methodology: This research analysis is of findings and data obtained from medical records from deliveries at Ain Shams University Maternity Hospital involving cases with the following criteria of recruited gestations for the research study singleton, vertex presentation with no fetal anomalies gestation and no previous cesarean deliveries, cesarean deliveries that were performed intrapartum were chosen. Perinatal and maternal clinical outcomes were correlated statistically with the time interval between delivery decision till performance of operative incision at 15 min, 16 to 30 min, and > 30 min were analysed and statistically compared.

1.3. Results: Among 300 suitable gestations, median time intervals of the decision to operate till performance of incision there was 46 and 27 minutes for labor arrest disorders and fetal causes for cesarean section, consecutively ($p < 0.01$). Gestations with fetal causes for delivery time interval was more than 30min had similar odds to the reference group.

3. Introduction

Quality indicators are of paramount importance in obstetric practice to improve and enhance patient safety measures [1] One clinical indicator of corner stone importance is speed of action in clinical scenarios requiring prompt decision making and implementation of management protocols that could be life saving [2]. In obstetric practice almost always, the time interval required for implementation of treatment protocols is one of the quality measures reflecting efficiency of medical care and safety of the hospital protocols. The time interval from cesarean section delivery decision till the performance of the operative incision. On the other hand, proper research studies are still required to clarify whether a 30 min interval or less is a contributory factor in improving maternal and fetal clinical outcomes [3]. The broad spectrum of cesarean delivery causes makes the design and performance of these type of research studies in an efficient and liable manner a complex job (including arrest disorders and non reassuring fetal status), 6–10 and doubt concerning definite Clinical decision timing within the intrapartum phase in order

to perform a cesarean section [4]. Various research studies are previously performed regarding this issue however personal differences between obstetricians and hospital protocols are required to be put in consideration when analyzing these research studies [5].

4. Aim

Aim of the current research study is to obtain the data base present in the maternity hospital of Ain Shams University to evaluate and clinically assess whether a decision till cesarean section incision performance could improve maternal and fetal clinical outcomes particularly if the time interval was within 30 min.

5. Methodology

This is a retrospective research study performed by obtaining hospital delivery records between September 2016 till May 2017 of 300 gestations delivered by cesarean section. Comprehensive meticulous data collection concerning cases clinical features, intrapartum measures and clinical events undertaken and performed by the clinical staff, and gestational maternal and fetal

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outcomes were gathered for all cesarean deliveries in a random manner from hospital records. Inclusive criteria was the cesarean delivery decision till surgical incision time intervals for CD (**Table 1**),

Table 1: Characteristics of the Research study cohort.

age	N=300
<20	15(5)
20-24.9	57(19)
24.9-29.9	78(26)
30-34.9	81(27)
>=35	69(23)
BMI	
<25	15(5)
25-29.9	99(33)
30-34.9	57(19)
>=40	48(16)
Nulliparous	180(60)
Indication for cesarean	
Arrest disorder	177(59)
Non reassuring fetal condition	123(41)

intrapartum clinical course and indications for performing Cesarean section. gestations were full term, singleton, with no fetal anomalies gestation in the vertex presentation and no previous cesarean section performed, did not have the indications for cesarean e.g HIV, active herpes infection, placenta previa,) and consequently undergone an intrapartum cesarean section. Exclusive research criteria non reassuring fetal condition, since it is not possible to know for what time duration the non reassuring fetal condition existed placental abruption and cord prolapse, An unfavourable neonatal composite outcome was used as the primary outcome, and was determined to have been present if any of the following existed: arterial umbilical cord pH < 7.0, 5-minute Apgar <5, HIE, convulsions, or mortality. An unfavorable clinical maternal outcome was considered to be present when any one of the following events existed postpartum hemorrhage, estimated blood loss > 1,000 cc, blood product transfusion, endometritis, septic wound infection or dehiscence, surgical injury, or hysterectomy.

6. Results

Data on 300 gestations were obtained from the hospital records. The median decision for cesarean delivery till operative incision time interval was 46 min (IQR= 34–66) for gestations with labor arrest obstetric indications and 27 min (IQR= 16–40) for women with fetal indications for cesarean section deliveries ($p < 0.01$). Although this median time interval was shorter for gestations that underwent cesarean section delivery for fetal causes (**Table 2**),

Table 2: Frequency of decision-to-incision times stratified by indication for cesarean delivery.

	Labor arrest disorders (n=177)(59%)	Fetal causes for CS (n=123) (41%)
<=15 min	2	24
16-30 min	15	35
31-45 min	33	22
46-60 min	20	10
61-90 min	17	6
91-120 min	7	2
>120 min	7	1

a considerable percentage in both research category groups (83% for labor arrest causes and 41% for fetal causes) had decision till performance of operative incision time that exceeded 30min. (DTI of 16–30 min) for the adverse neonatal and maternal composites (odds ratio [OR]: 0.8, 95% confidence interval [CI]: 0.4–1.7 and OR: 0.9, 95% CI: 0.6–1.3). For arrest disorders, the odds of the adverse neonatal composite were lower among women with a DTI of > 30 minutes (OR: 0.3, 95% CI: 0.1–0.8), and the adverse maternal did not display statistical difference (OR: 1.1, 95% CI: 0.8–1.6).

HIE, hypoxic-ischemic encephalopathy; NICU, neonatal intensive care unit.

N.B: All data presented as n (%). Wound complication ¼ cellulitis, separation; operative injury i.e injury to ureter, bowel, bladder. P-Values

calculated using exact methods.

7. Discussion

In the current research study, it has been displayed and revealed that a considerable number of gestations that undergone intrapartum cesarean section have a decision till operative incision time exceeding 30 min [6]. The obtained data of the current research study is in harmony with various priorly performed research studies (Table 3). additionally, longer time intervals are not correlated to adverse clinical maternal and fetal outcomes based on a previously performed systematic review and came to a conclusion that around 40% of operative cesarean section incisions were started in more than 30 min after the clinical decision.10 In addition prior research groups came to the conclusion that the 30-min time interval is not correlated to neonatal and maternal morbidity [7]. On the other hand a previous conducted research have shown that incision-to-decision times within gestations undergoing labor trial after prior CS especially in short time intervals were correlated to raised risk of maternal complications (i.e within less than 10 min). 13 On the other hand, in the analysis by Bloom et al, maternal complications did not reveal or display to raise at time intervals more than 30 min.11 Prior research studies

often have categorized [8].

Variable obstetric indications, involving those of high emergency (e.g., cord prolapse) with less urgent indications (e.g., less urgent non reassuring fetal condition or cervical arrest of dilation), [6]. Therefore one cause that previously performed research studies have not displayed neonatal morbidity in a significant fashion in

a correlation to increased time interval between cesarean section decision till performance of incision, is the tendency for getting confused by particular indications such as fetal distress which actually tends to make decision till incision time shorter due to rapid action of clinical staff in those type of clinical scenarios [1,3,5].
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Table 3: Neonatal and maternal outcomes by decision-to-incision time stratified by indication for cesarean.

	Arrest disorder					Fetal indication				
	<=15 min	16-30 min	>30 min	<=15vs16-30 p-value	>30 vs 16-30 p-value	<=15min	16-30 min	>30 min	<=15vs16-30 p-value	>30vs16-30 p-value
Neonatal out comes										
Ph<7	0	6(2)	1(0.4)	1	0.17	15(5)	9(3)	5(1.5)	0.05	0.5
Apgar <5 at 5 min	0	2(0.7)	1(0.4)	1	0.07	6(2)	6(2)	3(0.9)	0.17	0.73
HIE	0	3(1)	1(0.4)	1	1	3(1)	3(1)	1(0.4)	0.5	0.42
convulsions	0	0	0	-	-	3(1)	3(1)	0	0.31	1
mortality	0	1(0.4)	0	1	0.15	0	1(0.4)	0	1	0.45
NICU admission	18(6)	36(12)	30(10)	0.4	0.26	60(20)	48(16)	48(16)	0.23	0.8
ventilator	9(3)	36(12)	2(00.7)	0.43	0.28	6(2)	6(2)	3(1)	0.23	1
Hypotension With pressor support	0	1(0.4)	1(0.4)	1	0.56	3(1)	3(1)	3(1)	0.38	1
Maternal out comes										
Estimated blood loss >1000cc	18(6)	33(11)	36(12)	0.56	0.57	39(13)	33(11)	30(10)	0.37	0.84
Postpartum haemorrhage	18(6)	15(5)	18(6)	1	1	27(9)	21(7)	12(4)	0.29	0.02
Blood transfusion	8(2.8)	12(4)	1(0.4)	1	0.22	12(4)	3(1)	6(2)	0.5	<0.01
endometritis	8(2.8)	10(3.6)	6(2)	1	0.08	5(1.5)	6(2)	3(1)	1	0.49
Wound complication	0	1(0.4)	2(0.6)	1	1	3(1)	1(0.4)	3(1)	1	0.69
Operative injury	0	0	1(0.4)	-	1	3(1)	1(0.4)	0	0.31	0.45
hysterectomy	0	0	1(0.4)	-	1	0	0	1(0.4)	-	1

8. Conclusion

In this research study analysis, decision for cesarean delivery till performance of surgical incision more than 30 min time interval was not correlated to adverse neonatal or maternal clinical outcomes.

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