

Epidemiology of Mode of Labour in Suez General Hospital

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Abstract: Cesarean section (CS) rates have been increasing world wide, raising the question of the appropriateness of the selection of cases for the procedure. The World Health Organization (WHO) states that no region in the world is justified in having a cesarean rate greater than 10 to 15 percent, The Egypt Demographic Health Survey (EDHS) in 2014 revealed that 52% of deliveries in Egypt were by CS from survey in the previous six years before 2014, So the present work aimed to study the current trend in obstetric practice towards route of delivery whether vaginal or abdominal and rate of cesarean section in governmental hospitals nowadays. To accomplish this mission, a prospective study collected data from patient records in the period from 1-7-2015 to 31-12-2015 from patients attending labour ward at Suez general hospital for delivery to assess the modes of delivery and their relation to the fetomaternal mortality and morbidity. The study revealed that, the total CS rate was 33.0% compared to 66.2% for vaginal delivery and 0.8% for Vaginal Birth After CS (VBAC) and the rate of the primary C.S was 29.8%, the most common indication among CSs was repeated elective C.S (50.8%), the second common indication was failure to progress (13%), also there was increased CS rate with mal-presentations, postdates (especially with unfavorable cervix for induction), and abnormal Cardiotocography, There was a higher frequency of maternal admission to ICU and maternal death with CS mostly due to obstetric and/or medical complications rather than a complication from the procedure itself. There is a higher frequency of fetal morbidity and mortality with CS, most of them due to respiratory complications and congenital malformations.

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1. Introduction

During the last decade, obstetric practice has profoundly changed as a result of several published studies aimed to improve clinical practice. However, as attractive as it may sound, practicing maternal-fetal medicine in the midst of controversies is not an easy task. The passionate wide range of opinions regarding the best mode of delivery continues today, still hampered by insufficient and inadequate published data concerning short- and long-term outcomes of spontaneous vaginal, instrumental, or cesarean birth (1). Vaginal delivery is a natural process that usually does not require significant medical intervention, Spontaneous vaginal delivery at term has long been considered the preferred outcome for pregnancy. Because of the perceived health, economic, and societal benefits derived from vaginal deliveries (2). Cesarean section is one of the commonly performed surgical procedures in obstetrics and is certainly one of the oldest operations in surgery. One of the most dramatic features of modern obstetrics is the increase in the cesarean section rate. In recent years, the cesarean section rate has increased in different parts of

the world, both in developed and developing countries (3).

According to WHO recommendations, a CS rate between 5 and 15 % of total births is an optimal rate resulting in high efficacy. Based on the best evidence to date, a frequency of between 5 and 10 % seems to achieve the best outcomes. The cesarean section of more than 15 % is not associated with reductions in maternal and neonatal mortality and morbidity, but rather unnecessary, inappropriate, and riskier than beneficial in term of better health outcomes (4).

The Egypt Demographic Health Survey (EDHS) in 2014 revealed that 52% of deliveries in Egypt were by CS from survey in the previous six years before 2014 (5). Few studies have examined c-section rates in the Arab region. Most were based on small samples from hospital registers, owing perhaps to the lack of reliable administrative records at the national level. These studies as well as evidence from population-based data suggest that c-section rates are increasing in this region, and that uncertainty exists about their proper use in some contexts (6). So the present work aimed to study the current trend in obstetric practice towards route of delivery whether vaginal or

abdominal and rate of cesarean section in governmental hospitals nowadays and its impact on the fetal and maternal morbidity and mortality.

2. Patients and Method

The study is a prospective study conducted in the departments of obstetrics and gynecology in Suez general hospital based on data collected from patient records in the period from 1-7-2015 to 31-12-2015 to assess the mode of delivery and feto-maternal mortality and morbidity. Data was collected according to the following inclusion criteria: (1) Age 16-35 years. (2) Gestational age \geq 37 weeks. (3) Singleton pregnancy. (4) Primigravida and multipara (only previous one caesarian section accepted). (5) Average fetal weight (2500 - 4000 gm).

Institutional Ethical approval and permission to examine the patient files was obtained. Incomplete files were excluded from data, then Data collected from files suitable to our inclusion criteria and they summed up to 1504 patients.

Suez general hospital is a tertiary health care center with a capacity of 700 beds. The Department of Obstetrics and Gynecology at Suez general hospital has approximately 30 beds for inpatients and approximately 20 beds for laboring women located in the labor and delivery suite. The emergency unit accepts referrals from private and public units as well as self referred cases with obstetric emergencies. Cases in the emergency unit are therefore a mix of low and high risk cases as many women just turn up for normal delivery. In emergency unit, there are two operating rooms that are assigned to perform CS deliveries and other obstetrics operative interventions that require anesthesia. Daily obstetric clinics are running with a capacity of more than 200 antenatal women daily. During the study period, no active/organized antenatal education program was implemented.

Data were analyzed using Statistical Program for Social Science (SPSS) version 20.0. Quantitative data were expressed as mean \pm standard deviation (SD). Qualitative data were expressed as frequency and percentage. Independent-samples t-test of significance was used when comparing between two means, Chi-square (X²) test of significance was used in order to compare proportions between two qualitative parameters. P-value <0.05 was considered significant.

P-value <0.001 was considered as highly significant. P-value >0.05 was considered insignificant.

3. Results

The CS rate was (33.0%), SVD (66.2%), and VBAC (0.8%). (Table 1). the rate of the primary C.S was 29.8%. There were 496 cases delivered by C.S in our study, 51% of them due to elective repeated C.S, 13% due to failure to progress, 5% due to fetal distress, 8% due to CPD, 6% due to post date with unfavorable cervix, 5% due to mal-presentations, 12% due to other indications such as oligohydraminous, antepartum hge, eclampsia, infertility, and male gender fetus. (Table 2).

Vertex cephalic presentation was 97.8%, while other malpresentations were 2.2%, breech presentation was the most common mal-presentation, with highly statistically significant difference between the studied groups according to mal-presentations as it is associated with higher frequency of CS (Table 3). 6.47% of the studied groups have medical history for hypertension, diabetes mellitus, Rheumatic heart disease, and Pre-eclampsia with significantly higher CS rates among women with positive medical history for hypertension, diabetes mellitus, and Pre-eclampsia (Table 3).

Abnormal partogram represents (5.65%) of the studied groups and prolonged 2nd stage was the most common abnormal labor progress while late deceleration was the most common abnormal electronic fetal heart rate tracing. with a significant increase in CS rate in cases with abnormal CTG. (Table 4).

As regards the maternal outcomes in our study, the rupture uterus, hysterectomy, and maternal death rates were (0.3%), PPHge (5.32%), blood transfusion (2.79%), perineal tears {3rd-4th degree} (2.95%), and other outcomes as paralytic illness, pulmonary embolism, and ICU admission were (0.73%). there was a significant higher rates of ICU admission among CS group (1.4% in CS versus 0.1% in vaginal delivery). (Table 5).

As regards the fetal outcomes in our study the NICU admission rate was (3.46%) while the neonatal death was (0.47%), the CS group shows a significant increase at the rate of NICU admissions (8.3%) and neonatal death (1.2%) versus a rate of (1.1%) for NICU admission and (0.1%) for neonatal death at the vaginal group. (Table 7).

Table (1): Mode of delivery distribution of the study group.

Mode of delivery	No.	%
Spontaneous vaginal delivery (SVD)	996	66.2
Cesarean section (CS)	496	33.0
Vaginal birth after CS (VBAC)	12	0.8
Total	1504	100.0

Table (2): Relation between modes of delivery according to indication of CS.

Indication of CS	Mode of delivery						Chi-square test	
	SVD		CS		VBAC		x2	p-value
	No.	%	No.	%	No.	%		
Failure of progress	0	0.0%	64	12.9%	0	0.0%	135.845	<0.001
Fetal Distress	0	0.0%	27	5.4%	0	0.0%	55.874	<0.001
Elective	0	0.0%	252	50.8%	0	0.0%	615.209	<0.001
Cephalopelvic disproportion	0	0.0%	41	8.3%	0	0.0%	85.658	<0.001
Mal-presentations	8	0.8%	25	5.0%	0	0.0%	49.565	<0.001
Post date with unfavorable cervix	0	0.0%	31	6.3%	0	0.0%	64.326	<0.001
Others	1	0.1%	58	11.7%	0	0.0%	118.593	<0.001
Antepartum he	0	0.0%	3	0.6%	0	0.0%		
Fits	0	0.0%	3	0.6%	0	0.0%		
Infertility	0	0.0%	8	1.6%	0	0.0%		
Male gender	0	0.0%	1	0.2%	0	0.0%		
Oligohydraminous	1	0.1%	43	8.7%	0	0.0%		

Table (3): Relation between modes of delivery according to presentation, surgical history and medical history.

	Mode of delivery						Chi-square test	
	SVD		CS		VBAC		x2	p-value
	No.	%	No.	%	No.	%		
Presentations								
Cephalic	988	99.2%	471	95.0%	12	100.0%	27.971	<0.001
Malpresentations	8	0.8%	25	5.0%	0	0.0%		
Surgical history								
C.S	0	0.0%	239	48.2%	12	100.0%	613.323	<0.001
No previous C.S	996	100.0%	257	51.8%	0	0.0%		
Medical history								
Rheumatic heart	5	0.5%	3	0.6%	0	0.0%	57.631	<0.001
Diabetes mellitus	4	0.4%	18	3.6%	0	0.0%		
Hypertension	5	0.5%	6	1.2%	0	0.0%		
Pre eclampsia	23	2.3%	40	8.1%	0	0.0%		
Medically free	960	96.4%	435	87.7%	12	100.0%		

Table (4): Relation between modes of delivery according to partogram.

Partogram	Mode of delivery						Chi-square test	
	SVD		CS		VBAC		x2	p-value
	No.	%	No.	%	No.	%		
Fetal Tachycardia	0	0.0%	3	0.6%	0	0.0%	183.089	<0.001
Fetal Bradycardia	0	0.0%	5	1.0%	0	0.0%		
Late Deceleration	0	0.0%	15	3.0%	0	0.0%		
Protracted 1 st stage	0	0.0%	28	5.6%	0	0.0%		
Prolonged 2 nd stage	0	0.0%	32	6.5%	0	0.0%		
Variable Deceleration	0	0.0%	2	0.4%	0	0.0%		
Normal partogram	996	100.0%	411	82.9%	12	100.0%		

Table (5): Relation between modes of delivery according to maternal outcome.

Maternal outcomes	Mode of delivery						Chi-square test	
	SVD		CS		VBAC		x2	p-value
	No.	%	No.	%	No.	%		
Postpartum Hge	61	6.1%	16	3.2%	3	25.0%	14.828	0.002
Blood transfusion	22	2.2%	17	3.4%	3	25.0%	23.788	<0.001
Perennial Tear	38	3.8%	0	0.0%	1	8.3%	20.660	<0.001
Rupture uterus	1	0.0%	2	0.4%	0	0.0%	6.109	0.047
Hysterectomy	2	0.2%	1	0.2%	0	0.0%	0.024	0.988
Maternal Death	1	0.1%	2	0.4%	0	0.0%	6.109	0.047
Other	1	0.1%	10	2.0%	0	0.0%	16.981	0.009
ICU	1	0.1%	7	1.4%	0	0.0%		
Pulmonary embolism	0	0.0%	1	0.2%	0	0.0%		
Paralytic illus	0	0.0%	2	0.4%	0	0.0%		

Table (6): Relation between modes of delivery according to Apgar 1 & 5 min.

	Mode of Delivery			Kruskal-Wallis	
	SVD	CS	VBAC	H	p-value
Apgar 1MIN					
Range	5-9	5-9	6-9	13.532	0.011
Median (IQR)	8 (0)	8 (0)	8 (1)		
Apgar 5MIN					
Range	6-9	6-9	8-9	5.949	0.052
Median (IQR)	9 (1)	9 (1)	9 (0.75)		

Table (7): Relation between modes of delivery according to NICU admission & neonatal Death.

Neonatal Death	Mode of delivery						Chi-square test	
	SVD		CS		VBAC			
	No.	%	No.	%	No.	%	x2	p-value
No	995	99.9%	490	98.8%	12	100.0%	8.851	0.012
Yes	1	0.1%	6	1.2%	0	0.0%		
Total	996	100.0%	496	100.0%	12	100.0%		
NICU	Mode of delivery						Chi-square test	
	SVD		CS		VBAC			
	No.	%	No.	%	No.	%	x2	P
Admission	11	1.1%	41	8.3%	0	0.0%	51.311	<0.001
No Admission	985	98.9%	455	91.7%	12	100.0%		
Total	996	100.0%	496	100.0%	12	100.0%		

4. Discussion

Over the last three decades, cesarean section (CS) rates have been rising around the world (7). Fifteen countries with around 12 million births per year have CS rates over 30% (8).

Medical, legal, and social factors are behind the steady rise in cesarean delivery, including the use of fetal heart rate monitoring without fetal scalp sampling, a decline in competence in vaginal breech delivery, and the view that cesarean delivery is safer than vaginal delivery. Physicians are fearful of malpractice suits and more women are requesting cesarean delivery(9).

So, the present work aimed to study the current trend in obstetric practice towards route of delivery whether vaginal or abdominal and rate of cesarean section in governmental hospitals nowadays. In the present study, the total CS rate was 33.0% and this is close to what found by **Abdel-Aleem et al. (2013)** (10) who evaluated the CS rates and indications at Assiut University Hospital. They found that The CS rate was 32% while another study at Mansoura University hospital showed that the overall rate of delivery by CS was 47.25% This unacceptably high rate is justified by the authors as Mansoura University hospital is the only tertiary referral hospital in Dakahlia Governorate and receives women with high risk obstetric complications from a wide geographical area within the delta region in Egypt(11). In our study the first common indication for C.S was repeated elective C.S (50.8%) followed by failure to progress (13%) and cephalopelvic disproportion (CPD) (8%). This is close to the results found in **Labib et al. (2007)** who studied

the Cesarean Section deliveries in Gamal Abdel Naser Hospital, in Alexandria and The main indication of cesarean section was previous CS (41.2%), fetal distress (17.6%), failed trial and failure to progress (11.4%), CPD (10.3%), abnormal presentation (5.6%) and other indications summed to (12.4%) as 3.2% for antepartum hge, 2.5% for infertility, 2.3% for oligohydraminous, 1.4% for eclampsia, and 3% for non specific indications.(12).

The significantly higher CS rates among women with a previous CS can be attributed to the fact that there is no protocol for trial of labour after CS (TOLAC) in our department, as well as it may be a result of the effect of the current medical-legal climate on relevant practice patterns. And Women who decline vaginal birth after cesarean delivery (VBAC) and prefer elective repeat cesarean delivery account for a large proportion. In our study It was found that in most of cases with previous one CS ‘tender scar’ was reported as an indication in the medical record denoting either previous bad surgical technique or may be a trial to justify the operation and even though they didn’t take a trial of labour.

Regarding the CPD in our study as the 3rd common indication for CS it correlate with a study at Gamal Abdel Naser Hospital, in Alexandria which describes a CPD represents a 10.3% of CS indications (12). but not correlate with United States National Center for Health Statistics figures, based on over eight million births from 1995 to 1997, suggest that the caesarean section rate for CPD is 2.3% in the USA for infants weighing 3000 to 3999 g at birth, and 5.8% for those weighing 4000 g or more (13). The higher

rate in our study may be attributed to the fact that the diagnosis of CPD was done on individual variations and without pelvimetry or trial of labour.

The current study found higher frequency of CS in malpresentations. Among malpresentations, there was a higher frequency of CS in women presented with malpresentations rather than breech presentation. This is supported by the fact that normal labor may be tried in breech presentation. In our study there was 28 cases with breech presentation where 8 cases were delivered vaginally (28.6%) and 20 cases delivered by CS (71.4%). This is supported by **Wright (2005)** note which describes that Breech presentation was the third most important cause of the rise in cesarean delivery rate during the past 20 years (14). We believe that this CS rate among breech presentation can be lowered but The general practice in our department is still to deliver most breeches by CS (especially primigravida) with absence of a protocol for management of breech presentation and with no external cephalic version procedure. our study found a significantly higher CS rates among women with positive medical history for HTN, DM, and Pre-eclampsia. This is in agreement with **Pacher et al. (2014)** who found that The most frequent mode of delivery for women suffering from preeclampsia is elective Cesarean section (15), and also in agreement with **Edwards and Witter (1997)** study's conclusion which is "Preeclampsia do seem to have a higher risk of cesarean delivery".(16)

The present study found that CSs among post term pregnancies (53 cases) are higher than vaginal delivery (23 cases) especially those with unfavorable cervix (by terms of Bishop Score). As regards the induction of labour in our study, the main indication was post date cases and the overall number of cases of induction was 38 cases which divided into (24) cases with prostaglandin E1 (PG E1) 25ug (Vagiprost, *ADWIA Pharmaceuticals Company*), (9) cases with PGE1 50 µg (Vagiprost, *ADWIA Pharmaceuticals Company*), and (5) cases with oxytocin, the vaginal delivery rate was (58%) as 19 cases from PGE1, 2 cases from PGE2, and one case from oxytocin induction. While C.S rate was (42%). There was no significant difference in the maternal and neonatal outcomes.

There was a significant increase in CS rate in cases with abnormal CTG, this correlate with **Romano et al. (2008)** who found an increase in the rate of cesareans and operative vaginal deliveries for mothers who have continuous EFM, with no clear benefit for babies. This high rate of CS among the abnormal CTG group in our study may be attributed to the absence of fetal scalp PH measurement to exclude false positive abnormalities.(17)

There was a significant higher rates of ICU admission among CS group (1.4% in CS versus 0.1%

in vaginal deliver). And as regards the maternal death in our study there was a slight significant increase among the CS cases (0.6%) {one case in vaginal group and two cases in CS group}. This is correlate with the study by **Kamilya et al. (2010)** where Twenty seven mothers died among the (13627) CD mothers and 19 died among (30215) VD mothers. CD was associated with a (3.01) fold increase in the risk of maternal mortality, compared with VD(18). The fact that there was less maternal deaths among the spontaneous vaginal delivery and VBAC groups in our study may be attributed to absence of the operative vaginal deliveries with increased need for urgent C.Ss, and most of deaths occur with CSs were due to obstetric and/or medical complications and not from the operation itself.

In our study the CS group shows a significant increase at the rate of NICU admissions (8.3%) and neonatal death (1.2%) versus a rate of (1.1%) for NICU admission and (0.1%) for neonatal death at the vaginal group. This is close to the findings of **Shamsa et al. (2013)** study which shows significant higher rates of admission to NICU (5.7%) and neonatal death (3.4%) with Caesarean sections than the normal vaginal deliveries.(19)

Therefore we recommend the following to prevent further rise or to reduce the present rates:

1. Study the management protocols and modify them for all indications.
2. Every hospital that has an obstetric service should have some committee that examines every CS is performed in that hospital and determines whether it was indicated or not. If it was not indicated, then the physician who performed the section should be educated as to why it was not indicated.
3. Encouragement of VBAC according to recent *ACOG*, *RCOG* clinical guidelines, and *Flamm and Geiger* clinical decision rule for predicting successful VBAC.
4. Use of Instrumental delivery.
5. Revision of more precise definition of fetal distress and hopefully introduction of fetal scalp pH measurement facility to avoid a false positive predication of fetal distress by the use of electronic fetal monitoring.
6. Implementation of proper active management of labour to avoid false diagnosis of failure of progress.
7. The practice of ECV and assisted breech delivery may be selected safely in many patients with breech presentation at term, by more training of the new residents in the hospital.
8. Improvement in partograph and note documentation is important to effectively

- enhance feedback information and improve hospital practice.
9. Emphasis on evidence based clinical practices rather than personal experience based decisions.
 10. Implementation of Six evidence-based care practices that promote physiological birth which are:
 - A. Allowing freedom of movement for the laboring woman,
 - B. Providing continuous labor support,
 - C. Avoiding routine interventions and restrictions,
 - D. Encouraging spontaneous pushing in nonsupine positions, and
 - E. Keeping mothers and babies together after birth without restrictions on breastfeeding.
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