

Criteria Based Clinical Audit of Cesarean Section in a General Hospital in West Tigray, Ethiopia

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Abstract

Improving the quality of obstetric care is an urgent priority in low income countries, where maternal and perinatal morbidity and mortality remain high. Clinical audit is a tool to improve quality of care. Specifically clinical audit in MNCH is a tool to reduce maternal and perinatal morbidity and mortality. Cesarean section is among “five auditable” MNCH scenarios according 2012 women lung foundation. This study is a one year retrospective cross-sectional study among 99 women who delivered by cesarean section from July 2016-June 2017 in Mearg general hospital in West Tigray, Ethiopia. The aim of this survey was to investigate cesarean section rate (CSR) and indications of cesarean section to improve quality of obstetric care by reducing unnecessary cesarean sections. In the study period 99 women delivered by cesarean section among 749 institutional deliveries which gives an institutional cesarean section rate of 13.2%. Medical records were retrieved for 81 mothers. The most common indications for cesarean section were cephalopelvic disproportion (CPD) in 19 women (23.5%), antepartum hemorrhage in 11 (13.6%) and obstructed labor in 10 (12.3%). Majority of the cesarean sections 75(88.9%) were done under spinal anesthesia. Seven (8.6%) mothers had no justified indication for cesarean section according to criteria based audit. From the total 99 cesarean sections there was one (1.0%) maternal death. There was significant number of cesarean sections done with medically unjustified indications but comparatively low with the country and global figure. The three common indications for CS in this study were CPD, APH, and obstructed labor. A huge percentage of lost medical files was observed. Keeping medical records is the safest, simplest and cheapest way to analyze cesarean section indications, to reduce unjustified/unnecessary cesarean sections.

Keywords: Cesarean section rate; Clinical audit; Obstetric care; Delivery

Abbreviations: APH: Antepartum Hemorrhage; CEmOC: Comprehensive Emergency Obstetric Care; CP: Contracted Pelvis; CPD: Cephalo Pelvic Disproportion; CS: Cesarean Section; CSR: Cesarean Section Rate; LUSCS: Lower Uterine Segment Cesarean Section; MNCH: Maternal, Neonatal and Child Health; NRFS: Non Reassuring Fetal Status; OL: Obstructed Labor; VBAC: Vaginal Birth after Cesarean Section

Introduction

Cesarean section (CS) is one of the ten signal functions of comprehensive emergency obstetric and neonatal care (CEmONC) that includes seven basic emergency obstetric care (parenteral antibiotics, anticonvulsants, uterotonic agents, manual removal of placenta, manual vacuum aspiration, basic neonatal resuscitation and assisted vaginal delivery) and blood transfusion, anesthesia and cesarean section [1]. The term clinical audit has been defined as “in depth analysis of clinical performance of health care over a specified period of time” [2]. There are three main approaches to obstetric audit namely audit of deaths (maternal or perinatal), audit of severe morbidity (or near-miss), and audit of clinical practice. Audit is based on criteria (or standards) of care which can be either implicit or explicit (e.g., criterion based audit) [3].

Improving the quality of obstetric care is an urgent priority in low income countries, where maternal and neonatal morbidity and mortality remain high [4]. Cesarean section can be a life-saving intervention for mother and baby when it is clearly indicated or vaginal birth is contraindicated, unnecessary cesarean section poses avoidable risks to the mother and her child, increased morbidity and mortality and may impact negatively on a woman's future reproductive health.

Birth by caesarean section also places extra demands on maternity services and provision of resources or needlessly raising cost [5-7]. The national population based cesarean delivery rate in Ethiopia is 0.6% with variation between the regions from 0.2% to 9% and the overall institutional rate was 18%, which varied between 46% in the private for profit sector and 15% in the public sector. Currently about 20 million cesarean section (CS) deliveries occur each year worldwide [8,9].

Average global CSR is 19% of all births, ranging from 6-27%. Regions with high rates of CS include Latin America, North America and the Caribbean's (30-40%), followed by Europe (25%), Asia (19%) and Africa (7.3%). The international healthcare community has considered the ideal rate for caesarean sections to be between 10% and 15%, but not less than 5%. Since then, caesarean sections have become increasingly common in both high and low income countries. Medically justified caesarean section can effectively prevent maternal and perinatal mortality and morbidity.

However, there is no evidence showing the benefits of caesarean delivery for women or infants who do not require the procedure [10-12].

Methods

Study design and population

This cross sectional study was performed from July 2016 to June 2017. All mothers who delivered by CS in the study period are included except those mothers' of whom medical records were lost or without information.

Data collection and audit process

For these criteria based audit mothers' medical records were thoroughly reviewed by the auditing team using structured data collection abstraction. The checklist contained questions about background characteristics, time and date of admission, parity, cervical dilatation at the time decision for CS, partograph, type of anesthesia, status of membrane rupture, oxytocin augmentation, and indications for CS, maternal and perinatal outcome.

The list with criteria for absolute indications for CS (Table 1) was used to assess whether the indication for CS was in accordance with these audit criteria.

Absolute Indications	Remark
Absolute CPD	In the presence of adequate contractions failure to progress of labor e.g., contracted pelvis (CP) or malpresentations
APH	with active bleeding that endangers maternal or fetal live
Obstructed labor	Action line is crossed, a membrane is ruptured and presences of signs of imminent Uterine rupture.
Two previous CS scar	-
Single non LUSCS	Classical or low vertical CS
NRFS	Persistent bradycardia FHB<100 BPM or persistent tachycardia FHB>180 BPM despite intrauterine resuscitations
Cord prolapse	pulsating cord and instrumental vaginal delivery was not feasible or failed
Malpresentation	transverse lie, footling breech, hand prolapse, shoulder, brow, face (persistent mento-posterior/mento-transverse)
Failed induction	Despite adequate contractions or maximum dose of uterotonic agent achieved for at least 6-8 hours and no adequate progress of labor
Failed VBAC	After TOL in mothers previously give birth via CS after fulfill prerequisites of trial of vaginal delivery and failure to progress labor
Twin pregnancy	First baby non vertex or failure to progress of labor

Table 1: Criteria based audit and absolute indications for CS used for this survey.

Operational Definitions

Despite several existing CS classification systems, based on obstetric characteristics or on indications, a universally accepted list of absolute indications with clear criteria for CS does not exist.

Justified indication

Acceptable partogram

This is the basis for everything. If the partogram is not good enough for action to be taken it is clearly unacceptable.

Documentation

If there is no documentation on cesarean section indication the cesarean section is said to be unjustified.

Strong contractions

There must be either a clear maternal or fetal indication or both. "Big baby" is never an acceptable indication! If the partogram indicates obstructed labor or mechanic dystocia there must be sufficient contractions documented and insufficient progress (crossing of action line) in spite of membranes ruptured. Insufficient (too weak) contractions imply dynamic dystocia, which is different from

obstructed labor. This is never in itself a justification for cesarean section unless oxytocin augmentation has been initiated.

Correct management

Membrane rupture

Cesarean section in case of poor progress of labor with intact membranes is never justified if there is no maternal indication of cesarean section. Rupture of membranes should be followed by oxytocin augmentation if contractions do not follow after rupture of membranes. If membranes were ruptured ("ARM") by health worker, indicate the hour of this procedure.

Augmentations

Oxytocin infusion must be given with caution, particularly in multiparas women. A cesarean section is never justified in cases with insufficient (weak) contractions unless augmentation (stimulation with oxytocin) has been tried. Indicate also the hour when oxytocin infusion was started.

Data Analysis

Data analysis was performed with SPSS version 22. All results are reported as numbers (n) and frequencies (%) (Tables 2 and 3).

Variables	Clinical characteristics	N	Percentage (%)
Date and time delivery	Yes	80	98.8
	No	1	1.2
Parity	0	25	30.9
	01-Apr	45	55.6
	>5	10	12.3
	Unknown	1	1.2
Previous CS scar	One scar	6	7.4
	Two scar	1	1.2
	No scar	74	91.4
Rupture membrane	Yes	38	46.9
	No	33	40.7
	Unknown	10	12.3
Strong contraction	Yes	41	50.6
	No	20	24.7
	Unknown	20	24.7
Induction/ Augmentation	Yes	19	23.5
	No	58	71.6
	Unknown	4	4.9
Cervical dilation	0-3 cm	26	32.1
	4-9 cm	32	39.5
	Full	7	8.6
	Unknown	16	19.8
Type of anaesthesia	Spinal	72	88.9
	GA	6	7.4
	Unknown	3	3.7
Maternal outcome	Alive	80	98.8
	Died	1	1.2
Perinatal outcome	Alive	81	97.6
	Still birth	2	2.4
Justified indication	Yes	74	91.4
	No	7	8.6
Correct management	Yes	75	92.6
	No	6	7.4
Acceptable parthograph	Yes	37	45.7
	No	9	11.1
	Not applicable	35	43.2

Table 2: Clinical characteristics (n=81).

Indications	N	Percentage (%)
CPD	19	23.5
Obstructed labor	10	12.3
APH	11	13.6
Failed induction	9	11.1
Others	9	11.1
NRFS	8	9.9
Failed VBAC	6	7.4
Breech	5	6.2
Twin	2	2.5
Cord prolapse	2	2.5
Total	81	100

Table 3: Indications for CS.

Results

In the study period 99 women delivered by cesarean section among 749 institutional deliveries which gives an institutional cesarean section rate of 13.2%. Medical records were retrieved for 81 mothers. The most common indications for cesarean section were cephalopelvic disproportion (CPD) in 19 women (23.5%), antepartum hemorrhage in 11 (13.6%) and obstructed labor in 10 (12.3%). Majority of the cesarean sections 75 (88.9%) were done under spinal anesthesia. Seven (8.6%) mothers had no justified medical indication for cesarean section according to criteria based audit. From the total 99 cesarean sections there was one (1.0%) maternal death and from the audited 81 cesarean section there were two (2.4%) perinatal deaths (Figures 1 and 2).

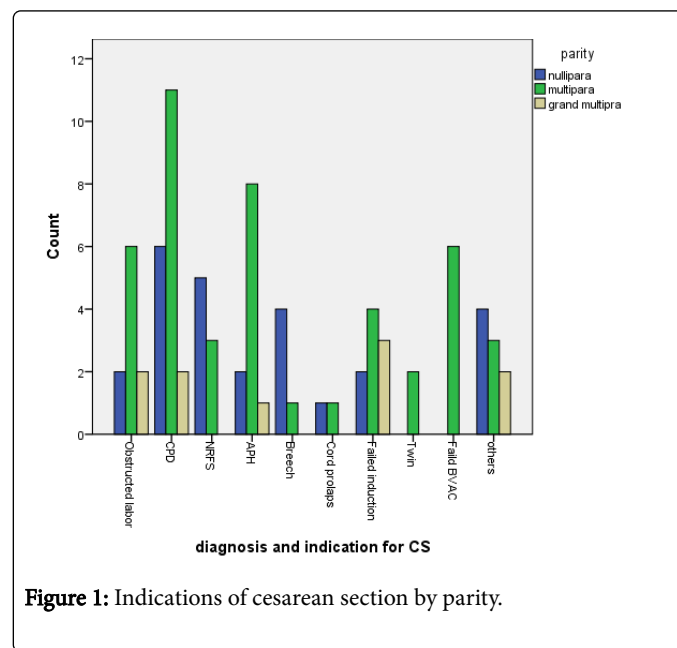


Figure 1: Indications of cesarean section by parity.

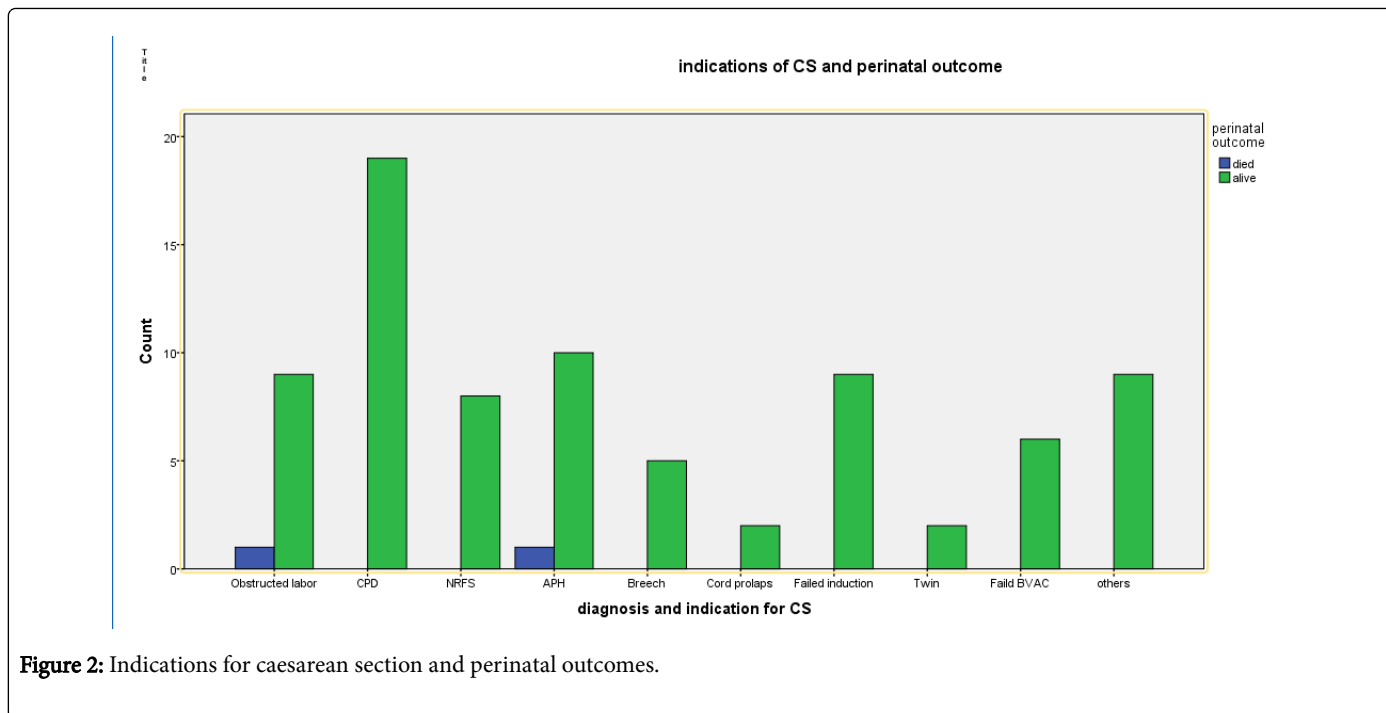


Figure 2: Indications for caesarean section and perinatal outcomes.

Discussions

Although CSR is rising globally but in fact there is no single evidence that increasing population based CSR above 10% reduces maternal and perinatal morbidity and mortality according to the ecological study from 159 countries [13]. This study revealed 13.4% institutional based CSR; this finding did not include those mothers who delivered elsewhere outside the hospital in the catchment area (Home, health post, health center and primary hospital deliveries). According the EDHS 2016 institutional delivery rate is 26.2% [14], so it is possible to imagine what will be the overall population based CSR, which is too far below the WHO recommended rate. The CSR in this survey is comparable with the study in Adigrat hospital (14.3) [15], but below the national figure (18%) [8], and the study shown in Addis Ababa (19.2%), Mizan Aman hospital southwest Ethiopia (21.1%), Jimma university specialized teaching hospital (28.1%), Attat hospital Gurage zone (27.6%), Harar East Ethiopia (34.3%) both in public (26.6%) and private (58.7%).

This discrepancy might be due to differences in the study area and most of the above study was conducted in specialized referral teaching hospitals [16-20]. Our survey finding was also far below the global figure, North America (32.3%), Oceania (31.1%), Europe (25%), Asia (19.2%) but above the African rate of CS (7.3%) [21]. CPD (25.3%) was the leading indication for cesarean section in this survey which is comparable with other studies from Ethiopia (Adigrat, Jimma specialized hospital and Atta hospital) [15,18,19] and other African countries like northern Namibia, Nigeria [22,23].

This could be explained by high rate of childhood malnutrition in low income countries which leads to contracted pelvis but needs further investigation, but study in Tikur Anbessa showed that the leading indication for CS were repeated CS (32.4%) as compared to our study 7.4% which might be explained by high primary CS rates [24]. A study performed by Medecins sans Frontieres in some Sub-Saharan African countries showed obstructed labor (31%) was the commonest indication for CS. which comparatively higher than (12.3%) the

finding on this study but in modern obstetrics having obstructed labor is completely obsolete [25]. In this study there were seven (8.6%) CS done without justified medical indication according the criteria based audit which is similar with report from Addis Ababa (6.9%) [16] but lower than the report from Tanzania (19.5%), global survey by WHO (14.2%) and china (69%). This might be due to clinicians/physicians' clinical decision making skills difference [5,26]. Majority of CS procedures were performed under spinal anesthesia 75 (88.9%) which is with accordance WHO guideline recommendation and study done in Adigrat hospital Northern Ethiopia (94.1%) [15].

Conclusion

The institutional CSR in this survey were within the WHO population based CSR recommended limit but still there was significant number of cesarean sections done with medically unjustified indications but comparatively low with the country and global figure. The three common indications for CS in this study were CPD, APH, and obstructed labor and there were high medical records lost observed. Improving the quality of obstetric and perinatal care is an urgent priority worldwide and criteria base clinical audits can play key role in this process by critical analysis of current medical practice and identification of substandard care factors. Keeping medical records is the safest, simplest and cheapest way to analyze cesarean section indications, to reduce unjustified/ unnecessary cesarean sections.

Recommendation

This is an eye opening survey or clinical audit finding on CS which can be baseline for other studies or clinical audit across the region as well at country level. Even though the number of CS done for unjustified medical indications are comparatively low to the studies done worldwide, but still the hospital needs clear indication protocol to minimize unnecessary obstetric surgeries, thereby it is possible to reduce needlessly short and long term maternal and perinatal complications as well cost expenditures.

We observe there were unexpectedly high rate of patient's card lost in the study area/Mearg general hospital, and the hospital management body should establish strong system that kept medical records safe.

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Ethical Clearance

Ethical clearance was collected from Mearg general hospital senior management committee after the research proposal was reviewed. Confidentiality was maintained throughout the study.

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