CAESARIAN SECTIONS: FREQUENCY AND INDICATIONS AT PERIPHERAL TERTIARY CARE HOSPITAL

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ABSTRACT

Objective: This study was conducted to determine the frequency and indications of caesarian section (CS) at Combined Military Hospital (CMH) Abbottabad.

Study Design: Descriptive cross sectional study.

Place and Duration of Study: Obstetrics & Gynecology Department, CMH Abbottabad, from Sep 2016 to Mar 2017.

Material and Methods: A total of 2,340 females delivered during the study duration were enrolled in study. Medical records of all the patients were analyzed retrospectively to determine the CS rate. Patient's demographic data, obstetric history, and indications and type of CS were recorded. Data were entered, coded and analyzed in IBM SPSS Statistics 20 software. Descriptive statistics were produced.

Results: Of 2340 births, 1093 (46.7%) were via CS with about 50.9% being emergency CS. Mean age of the patient who underwent CS was 26.7 years. The most frequently noted indication was previous CS (59.4%), followed by poor progression of labor (32.2%), and fetal distress (26.9%). More than half of the women (57.7%) who underwent CS fell into Robson Group 5 i.e. were multiparous with at least one previous CS and had a single cephalic pregnancy at term.

Conclusion: CS rate at our setting was comparable to rates at similar tertiary care hospitals in Pakistan. The most common indication was previous scar, the most frequently observed indication in literature.

Keywords: Caesarean section, Frequency, Indications, Robson classification.

INTRODUCTION

Caesarian section (CS) has become one of the most commonly performed surgeries in the world[1]. CS is medically indicated when a better outcome of pregnancy is expected with CS than with vaginal delivery, and is life saving in many emergency obstetrical conditions. Common indications for CS are poor progression of labor, fetal distress, and malpresentation of the fetus[2]. Compared to earlier techniques, the transverse lower uterine segment incision CS has a significantly lower risk of uterine rupture during subsequent vaginal deliveries, however, a uterus scarred by previous CS still remains one of the most common indications for CS in numerous settings[3].

If appropriately employed, CS can effectively reduce maternal and infant mortality. In countries where access to skilled obstetric care is limited, low CS rates are associated with higher maternal and infant mortality[4,5]. Improving access to CS is an essential component of reproductive health services. Policy makers and clinicians should make every effort to provide CS to women who have a clinical indication[5]. On the other hand, for women who do not require a CS, the benefits of performing a CS for women or infants remain unproven. Rather, CS carries an intrinsic risk leading to higher rates of adverse outcomes, especially for the mother in the short term[6,7]. CS also carries risks which can not only affect the outcome of the pregnancy for which it is performed but also the long term health of the mother and the child, as well as future pregnancies[8]. Significant complications including permanent disability or death can occur due to CS, especially in settings which are under equipped or under staffed, and lack the capacity

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to properly treat surgical complications. Performing medically unnecessary CS adds burden on healthcare facilities as a CS requires more human resources and has a higher financial burden than a vaginal delivery[9]. In poorer economies such misallocation of resources could have significant negative economic and pubic health consequences. Therefore it is critical that a CS is only performed when after a comprehensive risk and benefit analysis a clear advantage is expected over spontaneous vaginal delivery[10].

CS rates continue to rise worldwide, not only in the developed countries but also in most of the developing countries[11,12]. CS rate at the population level reflects the overall accessibility and utilization of CS in a country or region and is a marker for evaluation and monitoring of emergency obstetric services. According to World Health Organization (WHO) for population level CS rates below 10%, maternal and neonatal mortality decreases when CS rates increase, even after accounting for changes in socioeconomic factors. Mortality rates do not further decrease when CS rates increase above 10% and up to 30%[12]. Population level CS rates cannot, however, be used to monitor service utilization, clinical outcomes and quality of care at the hospitals and other healthcare facilities because the CS rates at this level depend upon the specific characteristics of the patients who utilize these facilities. The proportion of complicated patients requiring CS is likely to be greater at tertiary care and teaching hospitals than the in the general population. To address this issue, WHO recommends that hospitals use Robson classification system to categorize women admitted for delivery. The Robson classification system divides all obstetric cases into ten mutually exclusive groups based on five basic obstetric characteristics: parity, onset of labor, gestational age, fetal presentation, and number of fetuses[12]. Robson classification, therefore, provides a more detailed picture around CS rates in health facilities. As the WHO report states, this recommendation is being reviewed by experts around the world and modifications are being suggested for implementation[12]. Our data for this study did not lend itself to calculate CS rates for each Robson group. We did, however, classify all of our CS cases by Robson criteria to see what proportion of our CS cases fall into each group. This will help us in evaluating implementation of Robson's classification system at our unit in future in a regular fashion (e.g. quarterly and annual statistical reports).

Many recent studies provide an insight into CS prevalence, indications and outcomes in different healthcare settings in Pakistan. This study was undertaken to add to this important and growing body of knowledge so that clinicians and patients are able to make evidence-based decisions. The aim is to determine the prevalent rate of CS at our setting.

PATIENTS AND METHODS

This is a descriptive study carried out at the department of Obstetrics & Gynecology, CMH Abbottabad from September 2016 to March 2017 over a period of 7 months. All caesarian deliveries conducted after age of viability were included in study however cases of fetal anomalies, termination of pregnancies or missed abortion were excluded from the study. Non probability consecutive sampling method was used. All deliveries were conducted by specialist or residents under specialist supervision. Data of all the patients are routinely maintained in operation theatre. Medical records of obstetrical patients were analyzed to determine the CS frequency. For CS performed in the study period, data collected included patient demographic data, obstetric history, and indications and type of CS. Data were entered, coded and analyzed in IBM SPSS Statistics 20.0 software. Descriptive statistics were produced. Frequency and percentages were calculated for key study variables.

RESULTS

A total of 2,340 deliveries were documented for the study period, out of which 1,093 (46.7%) were conducted by CS. Mean age of patient was

26.7 with range of 18-43 years. Out of 1,093, 556 (50.9%) were emergency CS while remaining 537 (49.1%) were planned. Out of 1,093 CS performed during the study period, 426 (39.0%) were primary CS. Of the 667 women who previously had CS, 338 (30.9%) had one previous CS, 230 (21.0 %) had two previous CS, 87 (8.0%) had three previous CS and 12 (1.1%) had four previous CS.

Demographic and obstetric characteristics of women who underwent CS are summarized in table-I.

The most frequently noted indication was previous CS, followed by fetal distress, and poor progress of labor. For primary CS, fetal distress was the most frequently observed indication followed by poor progression of labor, and fetal malpresentation (table-II). Table-III presents the overall frequency of each indication.

Overall, 685 (62.7%) patients had a single indication for CS and 408 (37.3%) had multiple indications. For patients who had a single indication, previous CS 369 (53.9%) was the most common indication, followed by poor

Table-I: Demographic and obstetric characteristics of CS cases (n=1039).

		All CS		Primary CS	
		Frequency	**Percentage(%)**	**Frequency**	**Percentage (%)**
Age	18-24	260	23.8	138	32.4
	24-29	450	41.2	175	41.1
	30-34	294	26.9	86	20.2
	35-39	86	7.9	26	6.1
	≥ 40	3	0.3	1	0.2
Gravidity	Primigravida	258	23.6	258	60.6
	Multigravida	672	61.5	127	29.8
	Grand-multigravida	163	14.9	41	9.6
Parity	0	295	27.0	295	69.2
	1	336	30.7	56	13.1
	2	280	25.6	39	9.2
	3	131	12.0	21	4.9
	4	31	2.8	3	0.7
	≥5	20	1.8	12	2.7
Term	Full	1074	98.3	420	98.6
	Post	16	1.5	4	0.9
	Pre	3	0.3	2	0.5
Lie/ presentation	Cephalic	1006	92.0	368	86.4
	Breech	77	7.0	51	12.0
	Transverse	8	0.7	5	1.2
	Occipitoposterior	2	0.2	2	0.5
Number of Fetuses	Single	1052	96.2	398	93.4
	Twins	40	3.7	27	6.3
	Triplets	1	0.1	1	0.2
Labor	Spontaneous	215	19.7	87	20.4
	Induced	70	6.4	66	15.5
	None	808	73.9	273	64.1
Type of CS	Planned	537	49.1	72	16.9
	Emergency	556	50.9	354	83.1

progression of labor 162 (23.6), and fetal distress 90 (13.1%). Of the 426 primary CS, 301 (70.6%) had a single indication; poor progression of labor being the most common 155 (51.5%), followed by fetal distress 83 (27.6%) and fetal malpresentation 36 (12.0%).

For patients with multiple indications (n=408) the most frequently observed combinations were previous CS & poor progression of labor 125 (30.6%), previous CS & fetal distress 80 (19.6%), and poor progression of labor & fetal distress 56 (13.7%). For primary CS with multiple indications (n=125), the most commonly observed combinations were poor progression of labor & fetal distress 56 (44.8%), poor progression of labor & bad obstetric history 16 (12.8%), and poor progression of labor & fetal malpresentation 12 (9.6%).

More than half of the women who underwent CS fell into Robson Group 5 i.e. were multiparous with at least one previous CS and had a single cephalic pregnancy at term.

Fetal sex was noted for 1070 (97.9%) cases; 562 (51.4%) were male while 508 (46.5%) were female. Overall, mean APGAR score at 1 and 5 minutes were available for 1068 (97.7%) cases. Mean APGAR score at 1 minutes was 7.8 (SD = 0.952), and mean APGAR score at 5 minutes was 9.6 (SD = 1.052).

Table-II: Indications for CS (n=1039).

	All CS		Primary CS	
	Number of patients	**Percentage of patients**	**Number of patients**	**Percentage of patients**
Previous CS	649	59.4	NA	NA
Fetal distress	352	26.9	259	60.8
Poor progression of labor	294	32.2	156	36.6
Fetal malpresentation	84	7.7	60	14.1
Hypertensive disorders of pregnancy	66	6.0	35	8.2
Bad obstetric history	24	2.2	17	4.0
Abnormalities of placenta	20	1.8	10	2.3
Gestational diabetes mellitus	13	1.2	6	1.4
Hemorrhagic disorders	6	0.5	4	0.9
Other	6	0.5	4	0.9
Maternal request	1	0.1	1	0.2

DISCUSSION

Population level CS rate in Pakistan was reported to be 14.1% in 2013, up from 7.1% from the previous report in 2007, with wide regional variation, ranging from 1.5% in Baluchistan to 26.6% in Islamabad[14,15]. Many recent studies provide CS rates and indications at different hospitals from different regions of Pakistan. The CS rates reported in these studies range from 21.4% to 56%[16-21]. Our observed rate of 46.7% falls towards the upper limit of this range. For comparison, population level CS rate in India from 2011 to 2016 was reported to be 17.2% with the average institutional CS rates of 40.9% for private healthcare facilities and 11.9% for public healthcare facilities[22]. WHO reported a rate of 46.2% for 2010 in China, however, a more recent study estimates the 2014 rate to be 34.9%[23]. The 2015 CS rate in the United States was 32%[23].

We observed that having a previous CS was the most frequent indication for a subsequent CS as about three-fifths of our CS patients had at least one previous CS scar. Previous CS was the most frequent indication for CS in other recent studies done in Pakistan[15-20]. In these studies, the

frequency of previous CS as indication for CS ranged from 23% to 45.5%. This underscores the need for clinicians to exercise extreme care in deciding to perform the primary CS on any woman but especially on nulliparous women who are more likely to have additional pregnancies. In our study, 83% of primary CS were emergency compared to about 51% overall emergency CS rate. Similarly, our observed frequencies of other most common indications for CS were comparable to the results of these studies. For example, frequency of fetal distress ranged from 11.3% to 22%, whereas the frequency poor progression of labor ranged from around 19% to 26%.

There is need to determine prevalence of Trial of Labor After Cesarean (TOLAC) at CMH Abbottabad and to monitor rates of Vaginal Births After Cesarean (VBAC) to determine if any measures can be taken to reduce CS rates in women with one or two previous transverse lower segment CS scars.

Although we did not calculate CS rates for each Robson group separately, most of our CS patients fell into Robson Group 5 which is reported to be the group with the highest CS rates in many settings. However, for meaningful intra-institution temporal analyses for monitoring and evaluation, and for inter-institution comparisons, CS rates by Robson Group should be calculated and reported on a regular basis.

Table-III: Robson group distribution of all CS cases (n=1039).

	Frequency	Percentage (%)
Nulliparous women with single cephalic pregnancy, ≥37 weeks gestation in spontaneous labor	68	6.2
Nulliparous women with single cephalic pregnancy, ≥37 weeks gestation who either had labor induced or were delivered by caesarean section before labor	193	17.7
Multiparous women without a previous uterine scar, with single cephalic pregnancy, ≥37 weeks gestation in spontaneous labor	13	1.2
Multiparous women without a previous uterine scar, with single cephalic pregnancy, ≥37 weeks gestation who either had labor induced or were delivered by caesarean section before labor	85	7.8
All multiparous women with at least one previous uterine scar, with single cephalic pregnancy, ≥37 weeks gestation	630	57.7
All nulliparous women with a single breech pregnancy	19	1.7
All multiparous women with a single breech pregnancy, including women with previous uterine scars	35	3.2
All women with multiple pregnancies, including women with previous uterine scars	41	3.8
All women with a single pregnancy with a transverse or oblique lie, including women with previous uterine scars	6	0.5
All women with a single cephalic pregnancy <37 weeks gestation, including women with previous scars	3	0.3

According to the latest American college of obstetricians and gynecologists American College of Obstetricians and Gynaecologist (ACOG) guidelines, in spontaneous labor as long as fetomaternal status are reassuring, arrest of labor in first stage is defined as more than or equal to 6cm cervical dilatation with membrane rupture and 4 hours or more of adequate contraction or 6 hours or more of inadequate contraction and no cervical change.

For second stage of labor, specific time period hasn't been defined beyond which operated delivery is to be performed. In latent phase if fetomaternal status allow, CS for failed induction of labor can be avoided by allowing longer duration of latent phase e.g. up to 24 hrs or longer and oxytocin to be administered for at least 12-18 hrs after membrane rupture before deciding the failure of induction[24].

Limitation of our study is that since it was conducted at a single setting so it cannot be generalized to overall population.

CONCLUSION

CS rate at our setting was comparable to rates observed at similar tertiary care hospitals in urban areas of Pakistan. More than 83% of CS in women who did not have a previous CS was performed under emergency conditions. As observed in studies done all over the world, previous CS was the most common indication.

RECOMMENDATION

Antenatal care should be improved, patients should be educated. Trials of ECV and VBAC should be considered in appropriate patients. CS should be limited to estimated fetal weight of at least 5 Kg in women without diabetes and 4.5 kg in women with diabetes. Women should be counselled about Institute of Medicine (IOM) weight gain guidelines to avoid excessive weight gain. Residents should be trained to perform twin vaginal deliveries where first twin is cephalic. One to one support during delivery should be encouraged. Induction of labor without any identified reason should be discontinued. Research into standardising technique and focussing on amount of cervix untill full dilatation is achieved may help in reducing CS.

There should be a continuous process of evaluation which will not only bring the practice in context with international benchmarks but also improve health delivery system.

CONFLICT OF INTEREST

This study has no conflict of interest to declare by any author.

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