Rising Trend of Caesarean Section in a Tertiary Hospital Over a Decade

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Abstract:

Background information: *Since the early 1990s, emergency obstetric care (EmOC) in Bangladesh has played important role to reduce the maternal mortality rate. Along with other indicators of improved maternal care, there is a trend of rising caesarean section rates over the last decade affecting the economy of the country. According to demographic and Health Surveys conducted between 1993 and 2004, rate of caesarean section has risen from 2% to 6% which is more pronounced in urban area.*

Objective: *To assess the indications and the trends of caesarean sections done over a 10-year period from 1995-2004.*

Study Design: *A retrospective observational study of the cases of caesarean sections over a decade.*

Study setting: *Holy Family Red Crescent Medical College Hospital.*

Results: *23748 women were admitted in department of Obstetrics and Gynacology. Total deliveries were 21149(89.05% of total admission). The caesarean birth rate increased from 45.85% to 70.55%. The indications varied a little in cases of malpresentation and eclampsia. APH and IUGR has risen a little (from 2.56 to 2.6 to 1.83 to 2.34%) respectively. But proportion of repeat caesarean section and that of presumed foetal distress (or less foetal movement) increased (from 25.99 to 31.45% and from 8 to 15%), recently the indication, as maternal choice is also coming up (from .43 to .8%). The proportion has fallen in prolonged labour for cervical dystocia (from 17 to 2.6%) and obstructed labour (from 4.6% to .36%). The data were compared and analyzed by Z Test and corresponding P value was calculated which was not significant.*

Conclusion: *Though caesarean section is a very safe intervention in obstetrics at present, crucial evaluation of the indications is advocated to reduce the rates of caesarean secion.*

Keywords: *Caesarean section rates, Indications.*

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Introduction:

Caesarean section rates have increased very rapidly over the past two decades both in developing and the developed countries[1]. The rates increased from 18% in 1997-1998 to 22% in 2000-2001 in England[2], from 10.7% in 1981 to 15.3% in 1995 in France[3] and from 5% in 1973 to 15% in 2000 in Sweden[4]. Although stable for more than 15 years, the rate is still high at 26.1% in 2002, in the United States[5]. This epidemic has also extended to the developing countries. Twelve Latin American countries have rates above 15%, with a highest rate of 40%[6].

This continually rising caesarean birth rate is of increasing concern to both the professionals [7, 8] and the public.[9] Over the last 30 years, there has been a public health concern about increasing Caesarean section rates. In 1985, the World Health Organization issued a consensus statement suggesting there were no additional health benefits associated with a Caesarean section rate above 10 to 15%[10]. This also have generated wide spread concern and attempts to stop the reason to reduce this rate [11, 12, 13]. There are strong economic arguments for reduction of the rates[14]. Since early 1990s, emergency obstetric care (EmOC) in Bangladesh has improved to reduce the maternal mortality ratio. Along with other indicators of improved maternal care , there is a trend of rising caesarean section rates over the last

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decade affecting the economy of the country. According to demographic and Health Surveys conducted between 1993 and 2004, rate of caesarean section has risen from 2% to 6% which is more pronounced in urban area. In addition deficiency of adequate and efficient health care facilities in the rural settings increases the number of referral to the tertiary care centers. Analysis of the indications of these caesarean sections will reflect the causes of this increasing trend [15].

Objectives:

- To assess caesarean section rates over the past decade.
- To find out the indications of caesarean section.
- To compare between the rates of Caesarean section.

Materials and methods:

It is a retrospective study of all the cases of caesarean sections over the decade done in Holy Family Red Crescent Medical College Hospital. Data of all deliveries from 1995 to 2004 were collected from the yearly statistical record book produced annually by the department and the hospital. Patient's individual data were collected from the hospital record room. This included total obstetric admission, total numbers of vaginal deliveries, instrumental deliveries, caesarean sections, their indications for admission and caesarean section were noted. The major contributing factors were compared and their proportions were calculated. When two or more contributing factors were present only one major indication was taken. The rising trends were shown in graph. The data were compared between 1995 to1999 and between 2000 to 2004. Then Z Test was done for statistical analysis. Corresponding P value was calculated from the Tables.

Inclusion and exclusion criteria:

Figures contributing to a significant share in the indications of caesarean sections were included in the study. The rare and minor data were omitted.

Results:

The causes of caesarean sections were compared and shown in the tables and graphs. Table I shows that, total 23748 women were admitted in the obstetric unit over the decade. Numbers of the total deliveries were 21149 which comprised about 89% of total admission. The caesarean birth rate increased from 45.8% to 70.5% of total deliveries from 1995 to 2004. Spontaneous vaginal deliveries were reduced from 54.1% to 29.4%. **T**able II shows that, major indications of caesarean sections, which varied a little in cases of malpresentation but proportion of repeat caesarean section increased from 25.9% to 31.4% and that of presumed foetal distress (and reduced foetal movement) from 8.3% to 15%. Recently the indication as maternal choice is also rising up (from .4 to .8%). The proportion has been fallen significantly in prolonged labour for cervical dystocia (from 17.1 to 2.6%) & obstructed labour (from 4.6 to .4%). Proportion of IUGR has risen a little (from 1.8 to 2.3%) and that of post dated pregnancy from 1.8 to 2.8%. Percentage of APH remained unchanged (2.6%). Percentage of CPD and Eclampsia has fallen from 6.9 to 4% and .8 to .6% respectively over the years. Table III shows the comparative study of the total Caesarean sections and some important indications with their probability tests.

Figure 1a, shows the percentage of caesarean section rising from 45.8% in 1995 to 70.1% in 2004. Fig.-1b shows the percent of C/S due to presumed foetal distress was highest in 2000 and 2002 (18%) and lowest in 1997 (6.5%). Fig.-1c shows the percentage of caesarean section due to repeat C/S was lowest in 2001 (17.2%) and highest in 2004 (31.4%). Fig.-1d shows the

percentage of C/S due to IUGR was lowest in 1999 (1.5%) and highest in 2000 (4.2%).

Table-IV shows, the proportion of patients which contributes to caesarean section. This assessment form is adopted internationally and is known as 10 group classification of Caesarean section[10]. It shows, the more caesarean sections performed in group 1 and 2 are likely to result in a larger group 5 in future if those women have further pregnancies. That means occurrence of increased caesarean sections in first pregnancies will result in increased number of repeat sections in the subsequent pregnancies which actually happened in our cases.

The data of 2004 was taken for assessment in 10 group classification for cesarean section in our setting. The overall caesarean section rate was 70.5%. Out of these 5% were with spontaneous labour at term in first pregnancy; 4.3% were with spontaneous labour at term in their subsequent pregnancies; 22.15% were with repeat section at term; 14.46% were in subsequent pregnancies at term either induced or elective caesarean section. Primi breech was 1.6%, Multiparous breeches were 1.3%, abnormal lie were 2.4%, pregnancies at or above 36 weeks including previous caesarean section were 2.3%.

Table-I

Cumulative basic data from 1995 to 2004.
Values are shown as n (numbers), and figure in parenthesis shows the percentage.

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	Total
Total Obstetric cases	2285	2391	2646	2707	2239	2445	2404	1992	2255	2384	23748
Total deliveries	2257	2149	2356	2413	2213	2193	2060	1795	1777	1936	21149
Spontaneous vaginal Delivery %	1222 (54.1)	1028 (47.8)	1125 (47.7)	1155 (47.9)	987 (44.6)	802 (36.6)	693 (33.6)	571 (31.8)	611 (34.3)	569 (29.4)	8763
InstrumentalVaginal deliveries	13 (6)	7 (3)	7 (3)	9 (4)	3 (1)	7 (3)	2 (1)	0	2 (1)	1	51
Caesarean section%	1035 (45.8)	1123 (52.3)	1224 (52)	1249 (51.8)	1226 (55.4)	1392 (63.4)	1367 (66.3)	1224 (68.1)	1224 (68.8)	1366 (70.5)	12430

Table I - Shows that, out of 21149 deliveries, Cesarean section was 12430 that is almost 59% of total deliveries. It increased from 45.8% to 70.5% over the decade.

Table-II

Major Indications of Caesarean sections (C/S). Values are shown as n (numbers) and figure in parenthesis shows the percentage.

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Total C/S (%)	1035 (45.8)	1123 (52.2)	1224 (51.9)	1249 (51.8)	1226 (55.4)	1392 (63.5)	1367 (66.3)	1224 (68.1)	1224 (68.3)	1366 (70.1)
Repeat C/S	269 (25.9)	255 (22.7)	297 (24.2)	295 (23.6)	274 (22.3)	345 (24.8)	236(17.2)	293(23.9)	374(30.5)	429(31.4)
PET	131 (12.6)	102 (9.0)	222 (18.1)	233 (18.6)	149 (12.1)	212 (15.2)	298(21.7)	90(7.3)	133(10.9)	107(7.8)
Foetal distress	86 (8.3)	110 (9.8)	80 (6.5)	90 (7.2)	152 (12.4)	249 (17.9)	130(9.5)	220(18)	161(13)	205(15)
Prolong labour	36 (3.4)	29 (2.5)	59 (4.8)	58 (4.6)	60 (4.8)	63 (4.5)	74(5.4)	74(6.0)	27(2.2)	64(4.6)
Breech	41 (3.9)	55 (4.9)	63 (5.1)	61 (4.8)	100 (8.1)	70 (5.0)	45(3.3)	44(3.6)	21(1.7)	57(4.1)
Failed induction	38 (3.6)	76 (6.7)	56 (4.5)	46 (3.7)	47 (3.8)	74 (5.3)	33 (2.4)	61(5)	12(1)	37(2.7)
Cervical dystocia	177 (17.1)	121 (10.7)	69 (5.6)	55 (4.4)	12 (1)	16 (1.1)	108(7.9)	53(4.3)	33(2.7)	36(2.6)
PROM	23(2.2)	14(1.2)	17(1.3)	9(0.7)	21(1.7)	12(0.9)	31(2.2)	12(0.1)	19(1.5)	36(2.6)
IUGR	19(1.8)	23(2.0)	30(2.4)	26(2.0)	19(1.5)	58(4.1)	36(2.6)	33(2.7)	30(2.4)	32(2.3)
Obstructed. Labour	48(4.6)	31 (2.7)	22(1.7)	50(4)	40(3.2)	42(3.0)	24(1.7)	33(2.7)	3(0.2)	5(0.4)
Eclampsia	9(0.8)	17(1.5)	20(1.6)	19(1.5)	9 (0.7)	5(0.3)	12(0.9)	11(0.9)	6(0.5)	9(0.6)
APH	27(2.6)	12(1.0)	16(1.3)	29(2.3)	31(2.5)	36 (2.5)	25(1.8)	25(2.0)	27(2.2)	35(2.6)
CPD	72(6.9)	85(7.5)	83(6.8)	90(7.2)	94(7.7)	74(5.3)	62(4.5)	62(5.0)	52(4.2)	55(4.0)
Post Dated Pregnancy	19(1.8)	16(1.4)	23(1.8)	29(2.3)	22(1.8)	17(1.2)	32(2.3)	27(2.2)	37(3.0)	38(2.8)
Maternal choice	_	_	_	_	_	6(.4)	6(.4)	9(.7)	10(.8)	11(.8)

*PET- pre eclampsia, PROM- Prelabour rupture of membran, IUGR- Intra Uterine Growth Retardation, APH- Ante Partum Haemorrhage, CPD- Cephalo Pelvic Disproportion.

Table-III

Comparative study of the total C/S & some indications of C/S between 1995-1999 & 2000-2004

Parameter	1995-1999 (mean)	2000-2004 (mean)	Z Value (<1.96)	P Value (>.05)
Total C/S	1171.7	1314.6	1.84	
Repeat C/S	278	335.4	1.39	
C/S done for PET	167.4	168	.009	>0.05
C/S done for Post dated pregnancy	21.8	30.2	1.39	(Not significant)
C/S done for Foetal distress	103.6	122	0.39	
C/S done for Prolonged labour	48.4	60.4	.786	
C/S done for Obstructed labour	38.2	21.4	1.30	

Comparison of the above data showed that the value of z is not significant (<1.96), corresponding P value is >0.05 (not significant).

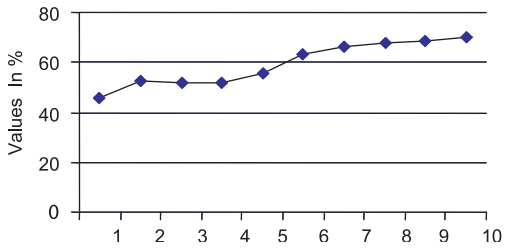

Fig.-1a : *Comparative study of the Percentage of total no. of C/S from 1995-2004.*

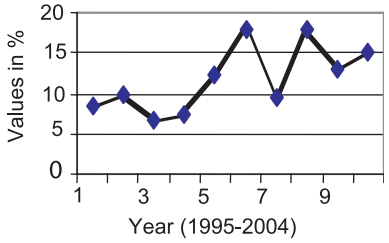

Fig.-1b: *Comparative study of the Percentage of C/S from presumed Foetal distress (1995-2004).*

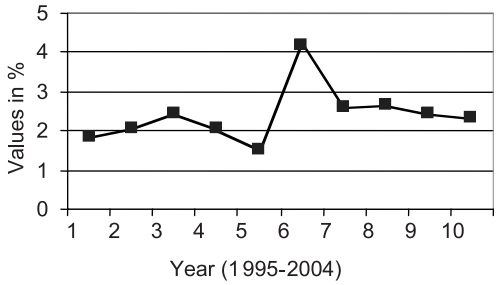

Fig.-1c: *Comparative study of the % of C/S due to IUGR (1995-2004).*

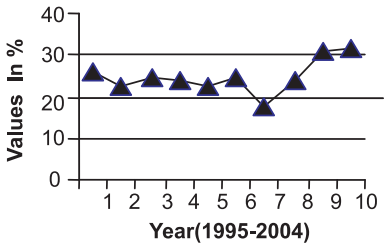

Fig.-1d: *Comparative study of the % of repeat C/S (1995-2004).*

Table-IV

Overall Caesarean Section (CS) rate (%)-1366/1936=70.55%

		No. CS over total No. Women in each group	Relative size of groups (%)	CS rate in each group (%)	Contribution made by each group to the overall CS rate of %
1.	Nulliparous, single cephalic, ≥ 37 weeks, in spontaneous labour	98/233	12% (233/1936)	42.06% (98/233)	5.06% (98/1936)
2.	Nulliparous, single cephalic, ≥ 37 weeks, induced or CS before labour	303/438	22.60% (438/1936)	69.17% (303/438)	15.65% (303/1936)
3.	Multiparous (excluding previous CS), single cephalic, ≥ 37 weeks, in spontaneous labour	84/348	17.97% (348/1936)	24.13 (84/348)	4.33% (84/1936)
4.	Multiparous (excluding previous CS), single cephalic, ≥ 37 weeks, induced or CS before labour	280/544	28.09% (544/1936)	51.47% (280/544)	14.46% (280/1936)
5.	Previous CS, single cephalic, ≥ 37 weeks	429/501	25.87% (501/1936)	85.62% (429/501)	22.15% (429/1936)
6.	All nulliparous breeches	31/43	2.22% (43/1936)	72.09% (31/43)	1.60% (31/1936)
7.	All multiparous breeches (including previous CS)	26/57	3% (57/1936)	45.61% (26/57)	1.34% (26/1936)
8.	All multiple pregnancies (including previous CS)	23/31	2% (31/1936)	74.19% (23/31)	1.18% (23/1936)
9.	All abnormal lies (including previous CS)	47/47	2% (47/1936)	1% (47/47)	2.42% 47/1936)
10.	All single cephalic, ≥ 36 weeks (including previous CS)	45/142	7% (142/1936)	31.69% (45/142)	2.32% (45/1936)

The 10 Group classification in 2004, Holy Family Red Crescent Medical College Hospital.

Discussion:

During the decade there was around 24.7% increase in the caesarean section rates in our setting which is comparable with an study done in our country[15]. Regarding the other findings, rate of instrumental deliveries decreased from 13 to 1 (.6% to 0%) which explains the rising trends of the caesarean sections. Yet this is becoming increasingly safe for women and children. The rate of pelvic floor problems (particularly urinary incontinence) is substantially higher in women who had vaginal deliveries than in women who had caesarean sections [16, 17, 18]. Although this evidence is discussed in the context of elective caesareans, it can be seen as challenging the professional perspective on the risk-benefit ratio for caesarean sections compared with vaginal delivery for specific indications[19]. Caesarean sections do involve certain risks, but the operation is much safer than in previous years. At the same time, the increased awareness of the complications of the vaginal delivery[20] and the increase in women's dissatisfaction with long labours of vaginal delivery have resulted in obstetricians having a lower threshold for advising delivery by caesarean section-[21-22]. In recent years, the incidence of Caesarean section for maternal request is gradually rising. Whether or not a Cesarean section should be carried out on a request is yet a controversial issue[23].

Studies shows that maternal request was one of the main indications for C/S (23%) in 1996[24]. Defensive

obstetrics is another common reason for high rates of caesarean section. It has been observed that 82% of physicians performed C/S to avoid negligence claims[25]. Repeat caesarean sections contributed 29%, presumed foetal distress contributed 22%, failure to progress in labour contributed 20%, 88% of breech babies, low birth weight 39%, and maternal choice **(**7%).

Other studies showed, the main indications of caesarean section were, repeat caesarean section (34.3%) , failure of progress (19.3%) and fetal distress 12.9% [23], another study done in our country showed repeat caesarean section decreased about 2.95% over the period of 8 years[15] . In our study the rate actually increased because the same patient attends the hospital for her successive deliveries. The rate of foetal distress and malpresentation in the same study showed a little increase (3.79% and 2.53% respectively) and considerably greater increase in caesarean section done for obstructed labour and eclampsia (2.79% , 3.75% respectively). But our study showed considerably greater increase in foetal distress and malpresentation (6.7%, .2%) and a decrease in obstructed labour and eclampsia (4.2%, .2%). The reason for this difference is the socio economical status of the patients attending both the settings. But overall there has been an increase in the rate of cesarean section in many countries of the world. The rising number of indications for cesarean section, the use of fetal monitors, the current medico-legal climate, and the indications for performing caesarean section has changed a lot in recent years and keep on changing for varied circumstances. Most caesarean section is currently performed to benefit the fetus, not the mother. This study was done to compare the changes in rates of caesarean section with a view to analyze and reduce the rates if possible. Although the reasons are multifactorial in most of the cases, and also the number of referral and workload pattern of the tertiary hospital, as well as the socio economical status of the patients , their demands for the service are the important factors for consideration, the findings of this retrospective study suggests that the rate of the caesarean section could be reduced in certain categories of patients.

The 10 group classification is currently being used internationally[10], and provides helpful information in the assessment of the causes of caesarean section rates. We have taken the data of 2004 for comparison. Unnecessary interventions in group 1 and 2 should, preferably be avoided. In '10 group classification', it has been shown that the category of pregnancy, the previous obstetric record of the woman, the course of labour and delivery, and the gestational age of pregnancy can add to the incidence of caesarean section. From these concepts and their parameters, the 10 groups were formed. Monthly critical analysis of these 10 groups is required including comparison with previous months in the same units and also in other units helps in analyzing the outcomes.

It is observed that the overall percentage of caesarean section has risen up. This could be due to the fact that more referral cases are appearing in commencing years. Also the less complicated population is being diverted elsewhere in nearby more inexpensive settings.

Conclusion and recommendations:

Caesarean section is undoubtedly a very safe intervention in obstetrics now a days. But yet, there is some morbidity even in tertiary care hospitals. With the advent of modern techniques of the procedure and also the safer anaesthesia, rates of caesarean sections has raised. More over patients with a previous caesarean sections are more likely to undergo a repeat section in the subsequent pregnancies mostly due to safety issues. As a result we have to perform a 3rd or 4th caesarean section which certainly carry a high morbidity risk. Also from the 10 group classifications we can categorize the cases which might undergo a caesarean section. So the situation definitely calls for an evaluation to catch hold the string of this rising trend.

Indications for doing caesarean section should be very cautiously evaluated. Mothers who opt for caesarean section just for their will needs be counseled properly. Labour analgesia also needs to be improved. Minimization of the costs of delivery can have a positive impact on the consumers. Trial for vaginal birth after caesarean section can also reduce the rate of repeat caesarean section, especially in tertiary care settings under proper vigilance. Periodic caesarean section evaluation sessions need to be more critically analyzed.

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Limitations of the study:

The study was a retrospective one and some of the indications did not reveal the actual proportion since only the main indication was documented out of multiple reasons for doing the operations. Also new tables regarding the complications of cesarean sections could not be given due to lack of raw data.

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