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RESEARCH ARTICLE

RISK FACTORS RELATED TO EPIDEMIOLOGY OF CAESAREAN SECTION IN URBAN
AREA OF GUJARAT

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ABSTRACT

Objective: This study was carried out to determine Caesarean Section rate and its related risk factors in urban area.

Material and Methods: Total 370 deliveries occurred in last 3 years were included in study and various epidemiological risk factors related to Caesarean section were identified.

Results: Total 370 deliveries were included in study, out of which 139 were Caesarean section. Majority of deliveries were conducted in institutions (98.9%). Among institutional delivery also majority done in private sector only (341 out of 366). Majority CS occurred in private facilities (134 out of 139) only. CS is more common in higher socio economic class. Majority of CS occurred during 1st birth order followed by 2nd and 3rd. with increasing birth order, the outcome of CS becomes more and more favoring male child.

Conclusions: Majority of CS in present study were conducted in private sector, which suggests some commercial interest may be at work. CS is more common in higher socioeconomic class due to their affordability. Good job status also associated factors for occurrence of CS.

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INTRODUCTION

Among various medical assistance, “Caesarean section (CS) is a medical boon” (Dutta, 2006). It’s a surgical procedure which is always helpful to both mother as well as child. It helps in dealing with complicated delivery thus reducing the maternal mortality as well as neonatal mortality and can significantly decrease the maternal as well as infant (mainly neonatal) mortality rates (Ronsmans Carine *et al.*, 2002). However, like any major surgeries it has its own side effects and complications (Dutta, 2006). Further when if performed in private sector (even in government sector), we cannot ignore its economic implications in terms of operative charges, cost of drugs, prolonged hospital stay and loss of wages of the patient as well as the attending family members. In recent years the rise in incidence of caesarean section is more directed to the welfare of baby besides saving the mother from risk of complicated vaginal delivery (Anil Kumar, 2006). According to World Health Organization (WHO) caesarean rate in any community should be between 5 -15 Percent. WHO endorsed the principle that there is no region in the world where a population-based caesarean section rate exceeding 15% of all live-births is justified (Ronsmans Carine *et al.*, 2002).

What has already been described as the “caesarean birth epidemic” may now well be considered a true pandemic, an emerging issue in mother-child health care. A recent leading editorial stressed that the rise in caesarean section deserves international attention, since the trend is no longer confined to only western industrialized countries (Mehta *et al.*, 2001). It is interesting to observe consistently such high CS rates in urban areas as compared to rural area, while the biological determinants or obstetric indications (for CS) need not to be so high in urban areas. Only thing which can be thought of is the availability of specialist services more in urban areas (Sreevidya and Sathiyasekaran, 2003).

This raises a range of concerns about the use of caesarean section for non-emergency cases, not least the progressive shift of resources to non-essential medical interventions in resource-poor settings and additional health risks to mothers and newborns following a caesarean section. It is not clear whether high elective caesarean rates are driven by medical, institutional or individual and family decisions, where a woman's decisions predominate her interaction with peers and significant others have an impact on her caesarean section choices (Leone Tiziane *et al.*, 2008).

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Objectives

- To obtain an estimate of caesarean section rates in urban communities of Surat district.
- To find out various risk factors (Medical, Socio-economical and biological) related to Caesarean section.

MATERIALS AND METHODS

The present study has been done in urban area of Surat city. The present study was a cross-sectional population based study and lasted from November 2010 to February 2011. The study was conducted in urban community of Surat city. Data collection was done by house to house survey with semi structured and semi open ended questionnaire.

Inclusion criteria for study area

Area under the jurisdiction of Surat Municipal Corporation (SMC) excluding the identified slum pockets as they do not reflect true urban situation. From urban area in Surat, central zone (Sagrampura) was selected randomly by lottery method and families were selected serially from the central point of the residential areas of the zone till whole area surveyed. In Surat city, Sagrampura is situated in central zone attached to ring road from Udhana darwaja to Majura gate. It comprises of people mainly of upper and middle class and native of Surat. There are two SMC run maternity homes Kadiwala Health Centre situated at Navsari bazaar road and Kshetrapal Health Centre situated at Kshetrapal temple road. New Civil Hospital of Surat is just 500 meters away from Sagrampura.

Only those houses could not be covered which were found locked. Data was collected from mothers and family members for deliveries in family during last 3 years. Data was collected on a semi-structured, semi open-ended proforma. Subsequently, all the data was entered into a master chart and then entered in MS-Excel, from where it was transferred to SPSS software. Subsequently appropriate test of significance were applied to delineate the predictors for deliveries.

RESULTS

Total number of house hold surveyed is 1249. Total population covered was 7456. Total 1463 eligible couple found and among them total 381 deliveries found in last 3 years but data related to 11 deliveries were unreliable and inadequate so they all have not been counted. So information related to remaining 370 deliveries was analyzed. Out of 370 deliveries in past 3 years 139 Caesarean section were found and remaining 231 were normal deliveries.

Table 1. Distribution of place of deliveries in study area

Place of delivery	No. (%)	No. (%)
1. Institutional		366 (98.9)
GOVT.HOSPITAL	22 (5.9)	
PHC	2 (0.5)	
CHC	1 (0.3)	
Private	341 (92.2)	
2.Home	4 (1.1)	4 (1.1)
Total	370 (100)	370 (100)

Table 2. Distribution of CS according to type of institutional facility

Institutional facility	Urban	
	No.	CS No. (%)
Govt. facilities	25	5 (20)
Private facilities	341	134 (39.3)
Total	366	139 (37.9)

Table 3. Distribution of job status and education in relation to CS

Job status	Caesarean No.	Vaginal No.	X ²	df
Working women	7	7	0.96	1
House wife	132	224		
Total	139	231		

X²= Chi square, Df= Degree of freedom

Table 4. Impact of socioeconomic classification on CS

Socio economic class*	No.	CSNo. (%)
	1	168
2	165	60 (36.4)
3	34	4 (11.8)
4	3	0
5	0	0
Total	370	139

*as per Modified Prasad's classification

Table 5. Distribution of birth order to CS

Birth order	Male No. (%)	Female No. (%)	Total
	I	55 (60.4)	36 (39.6)
II	24 (57.1)	18 (42.9)	42(100)
III	5 (83.3)	1 (16.7)	6(100)
Total	84	55	139

It represent very high (37.6%) CS rate in study area. In study area 99 percent of the deliveries were Institutional, Out of all institutional deliveries majority (92.2%) occurred in private sectors and only 6 percent occurred in government hospitals, remaining occurred in PHC (0.5%), CHC (0.3%) and at home (1.1%). On comparing CS proportion as compared to normal delivery in institution, it was found that there was less number of CS in Government setup (20%) as compared to private (39.3%), which clearly indicates some economic interest of private hospitals for doing CS.

On comparing relation between working status of women and CS it was found that in study area 50 percent (7 out of 14) working women had undergone CS, indicative of more CS proportion among working women as compared to housewife. On applying chi – square test a p value of more than 0.05 was obtained, indicative of no significant difference for job status and mode of deliveries. In study area majority population belongs to higher socioeconomic classes, among them also majority of CS occurred in class 1(44.6%) and 2 (36.4%) only.

On comparing relation of birth order to CS, it was found that as the birth order increases proportion of CS in relation to normal deliveries decreases. Majority of CS occurred during 1st birth order followed by 2nd and 3rd. No CS found after 3rd birth order. In term of sex of newborn and CS it was favouring male sex at every birth order.

In fact with increasing birth order, the outcome of CS becomes more and more favouring male child. It indirectly indicates role of prenatal sex determination and doing CS to get male child. In study area most common indication of CS perceived by couple was Cephalo Pelvic Disproportion (34.5%), followed by malpresentation (15.1%), fetal distress during labour (7.2%) and money making by doctor (7.2%). Fewer couple also perceived Hypertension during pregnancy, big baby, big head, cord tied around neck, Oligohydramnios, post maturity, meconium aspiration as indications of CS. Fewer also perceived it as pressure from doctor (2.2%) to do CS. One of the couple want birth of male child on fixed day, so on couple's request CS has been done. 10 couples believed it to be as money making by doctor. So around 10 percent couples felt that they were cheated by doctors and doctors made money by doing CS, which indicates faulty practice of CS.

DISCUSSION

Usually there are at least 150 to 180 eligible couple per 1000 population (Park, 2007). However in the surveyed population more eligible couple (196) were found. It may be noted that urban population under study was situated in the heart of city and it was a settled population and was devoid of migration. In present study Caesarean Section (CS) rate was 37.6 percent, WHO endorsed the principle that there is no region in the world where a population based CS rate exceeding 15% of all live births is justified (Ronsmans Carine, 2002). CS is a common operation with the significant long term consequences for women of child bearing age. It is therefore important to obtain an accurate understanding at national level as to why this operation is being performed in such high and varying proportions in different areas / institutes. In NFHS 3 percentage distribution of deliveries by CS in the urban area was 16.8 (National Family Health Survey, 2005-06). In present study it was found to be very high (more than 2 times than upper limit). The hazards (cost, morbidity etc.) outweigh the benefits of CS once its rates increase beyond 15 percent (Ronsmans Carine, 2002). Even in subsequent pregnancy if they opt for CS they do not understand hazards of CS so we have to educate women about it. The CS rates of 37.6 percent in present study in urban population raises serious questions about the indications of CS in this population.

Residents in urban areas in the entire country have accessibility and affordability which explain more than 3 times high CS rates. This urban rate of CS was also even higher than study done by Sreevidhya (2003) at Chennai in 2003 where it was 32.6 percent, which was a population based study in middle class population in Chennai and also from Bhasin *et al.*, 2007 in New Delhi where it was 34.4 percent. In present study institutional delivery rates were 98.9 percent and rest were home deliveries, which was consistent with study done by Bhasin *et al.* (2007) in New Delhi (99.3%), when compared between government and private sector in the present study, 20 percent deliveries were in government sector, which was less than found in study by Mony *et al.*, 2007. (29.8%), however it was higher than rates in that study by Bhasin *et al.* (2007) (7.6%). One of the observations of Mony *et al.* (2007).

Study was less private deliveries (8.4%), which is very less when compared with the present study (92.2%). CS rates are high in private sector than those of public sector. Studies have also found that middle class and upper class women who mostly opt for private providers are more likely to have CS because they develop closer relationships with their doctors (Padmadas, 2000) indicative of possibility that this extremely useful surgical procedure is being misused for profit purposes in the private sector at several places, it should be ensured that the CS are done either in emergency or when there is a definite indication are present.

On comparing relation between working status of women and CS it was found that 50 percent (7 out of 14) working women had undergone CS in past, indicative of more CS proportion among working women in study area but on comparing relationship between job status and mode of deliveries, the difference was found to be statistically insignificant ($p > 0.05$). Socio demographic characteristics play important role for CS rate in community. On comparing socio economic status in women who underwent CS more than 97 percent of CS occurred in class I and II, which accounted for 88 percent of total families. It indirectly indicates role of money for deciding CS rate in this higher social class.

On comparing the birth order and sex of baby, it was found that outcome of CS favouring male sex at every birth order. In fact with increasing birth order, the outcome of CS favoured more male child (57.1% for 2nd and 83.3% for 3rd birth order). On comparing relation of birth order to CS, it was found that as the birth order increased proportion of CS in relation to normal deliveries decreases. Majority of CS occurred during 1st birth order (43.5%) followed by 2nd (31.6%) and 3rd (23.1%). No CS found after 3rd birth order in study areas. The possible explain for this may be that 1st and 2nd child considered to be precious and there are also chances of high risk pregnancy during this time so there is high chance of performing CS. In a study by Chanthasanout *et al.* (2007) an inverse relationship between birth order and CS rate was observed, in which CS rate proportion for 1st, 2nd, 3rd birth order were 44.1 percent, 39.6 percent and 12.8 percent respectively, indicative that CS were more done for 1st birth order and decreased as birth order increases. In study by G. Anil³ CS proportion in 1st birth order was 28 percent, in present study it was 43.5 percent (much higher). On comparing various indications of CS as perceived by couple, most common indication was CPD (34.5%), followed by malpresentation (15.1%), fetal distress during labour (7.2%) and financial benefit achieved by doctor (7.2%). Few also perceived it as pressure from doctor (2.2%) to undergo CS. One of the couple wished birth of male child on fixed day, so they preferred CS over normal delivery. So from above data it was observed that there were no disagreements between indications of CS study area, while 13 out of 139 couples feel that doctor have forced them to undergo CS for more money payment. In one case it so as the couple who insisted for CS on a particular day as it was a male child.

Conclusion

- CS rates observed in present study (37.6%), which was higher than NFHS data (16.8%), further majority of CS in present study were conducted in private sector, which

suggest some commercial interest may be at work as there is a large difference of expenditure involved in a CS and vaginal deliveries.

- In present study majority of CS found in socio economic class I and II, this is mainly due to better education and more affordability of that population for health care services.
- In number of CS cases doctor fails to give any indication for doing CS, where 13 out of 139 couples perceived that they have been forced to undergo CS by doctors for monitory consideration.
- Birth order showed inverse relationship with CS. As birth order increases CS rates decreases.
- The sex of newborn child showed some impact on CS rate in study area, it was found favouring male child.

Recommendations

- The CS rate found in this study indicates that India is already headed towards a costlier, technology driven and interventionist medical care system. Interventionist attitudes are detrimental to the health and economical wellbeing of the society and should be urgently addressed. Embracing neglected public health goals and ensuring equity and accessibility of care for all sections of the population is the most efficient way to bring better health to the people.
- Safe reductions in the CS rates are possible, as hospital initiated programs can reduce CS use successfully by audit, review and action. At the same time there is a need to extend the facility of CS in non approachable area especially in government area or may be by a public private partnership.
- Public health education is the most important factors and the people should realize that government has established health facilities for the common masses and they must avail the available facilities.

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