Antenatal History and Caesarean Section in the Southern Part of Kerala, India

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Abstract

Caesarean births were originally used as an emergency birthing alternative for complicated births and labours that endangered either the life of the child or the mother. A rising trend in Caesarean rates has been reported from Kerala, the state with the best demographic characteristics and access to health care within India. In this context, this paper examines the extent of Caesarean section among women aged 15 to 49 years with only one child born in the five years preceding the survey in the southern part of Kerala with respect to their antenatal history. This study revealed that Caesarean section in the southern part of Kerala is much higher than for the state as a whole. Based on mothers' reply, 28% of the first live births occurred by Caesarean section in the southern part of Kerala. The women who had a dreadful experience in antenatal history had higher odds of Caesarean section than other women.

Introduction

Caesarean childbirth, an operation to deliver a baby through an incision in the abdomen, can be traced back through history to Egypt in 3000 B.C. The procedure's name comes from a set of Roman laws, *Lex Caesare*, which in 715 B.C. mandated surgical removal of an unborn fetus upon death of the mother (U.S. National Library of Medicine 1998). Until recent decades the operation usually had been used as a last resort because of a high rate of maternal complications and death. But with the availability of antibiotics to fight infection and the development of modern surgical techniques, the once high maternal mortality rate has dropped radically. As a result, the Caesarean childbirth rate has increased dramatically in all parts of developed nations (Anderson and Lomas 1984). It has also become common in both developed and developing countries in recent years.

There are many factors which account for rising Caesarean birth rates. By the 1960s, increasing emphasis was being placed on the health of the fetus. With declining birth rates and couples having fewer children, even greater attention was given to improving the outcome of pregnancy and infant survival in general (Sachs, Koblin, Castro and Frigoletto 1999). Another important contributing factor was the rising number of repeat Caesareans. As the number of women having their first

Caesarean increased, the long-held tenet "once a Caesarean, always a Caesarean" led to rapid increase in the number of repeat Caesarean births (Grey Bruce Health Unit 2004). At the same time, advances in medical care combined to make maternal death from Caesarean childbirth a rare occurrence. The safer the procedure became, the easier it was to decide to perform the operation. As a safe alternative to normal delivery, the Caesarean became a practical way to try to improve the outcome of difficult pregnancies.

Studies suggesting the benefit of Caesarean birth in dealing with various pregnancy complications also led to more Caesareans (Gary, MacDonald and Gant 1989). Obstetricians came to favour surgery in pregnancies with difficult deliveries that formerly would have required the use of forceps. Increasingly, physicians used the Caesarean method to deliver infants in the breech position prior to birth, adding still further to the rising Caesarean rate. The availability of facilities and trained obstetricians were found to be associated with the performance of Caesarean section (Kabra et al. 1994). The source of payment for the delivery (Stafford 1990; Betrollini et al. 1992; Haas et al. 1993) and the place of birth – i.e., whether it was a private or a public sector institution (Peterson 1990) – also influenced the performance of C-sections. In India, the need for births to occur at a predetermined auspicious time on the astronomical calendar resulted in a patient demand for Caesarean sections (Kabra et al. 1994).

According to the National Family Health Survey, the Caesarean rate is much higher in Kerala than other Indian states (IIPS 1994, 11PS and ORC, Macro 2000). A rising trend in Caesarean rates, from 11.9% in 1987 to 21.4% in 1996, has also been reported from Kerala, the state with the best demographic characteristics and access to health care within India (Thankappan 1999). In this context, this paper examines the extent of Caesarean section among women in the southern part of Kerala with respect to their antenatal history.

Methods & Materials

The data for this empirical analysis is taken from a survey on safe motherhood in the southern part of Kerala, India. In Thiruvananthapuram district, the capital city of Kerala was chosen for this study. In this district there are four taluks (Thiruvananthapuram, Chirayinkeezhu, Neyyatinkara, Nedumangadu), from which the Thiruvananthapuram taluk was randomly selected. By simple random sampling, two different geographical areas such as rural area and urban area were selected from the separate lists of the selected taluk. The samples were drawn so as to have an equal proportion of total households in each selected area. The survey was conducted from February 2002 to June 2002 and contained a detailed enquiry about socioeconomic and demographic backgrounds and antenatal history of currently married women who had a child below age seven years in the five years preceding the survey. The information was collected from 1,122 currently married women aged 15 to 45 years from households in the selected area, out of which only 321 couples with single child were taken up for the present study. Using univariate and multivariate statistical analyses, the study measures the association between antenatal history and Caesarean section.

Results

Socioeconomic and Demographic Characteristics of Couples and Caesarean Section

Table 1 provides information of the first live birth during five years preceding the survey that were delivered by Caesarean section and the background characteristics of couples. Based on mothers' reports, 28% of first live birth deliveries occurred by Caesarean section in the southern part of Kerala in the past five years. There is no wide variation in Caesarean section by rural and urban setup. Caesarean sections occur much more often in mothers who belong to a group above age 30 years than for younger mothers. Caesarean sections occur more among mothers whose husbands are aged more than 35 years.

The proportion of deliveries by Caesarean section increases with both mothers' and fathers' education. Thirty-five percent of births to mothers who have completed above 10th class were delivered by Caesarean section, compared with only around 16% of birth by illiterate and primary-level educated mothers. Caesarean deliveries are much more likely to occur among women whose spouses have more educational status and those who have work other than the unskilled labour sector.

Table 1: Percentage Distribution Caesarean Section by Background Characteristics of Couples

Background Characteristics	Total number	Number (%) of Caesarean section
Area		
Rural	151	44 (29.1)
Urban	170	46 (27.1)
Total	321	90 (28.0)
Age of wife (in years)		
< 26	200	48 (24.0)
26– 30	102	33 (32.4)
> 30	19	9 (47.4)
Education of wife		
No schooling & Primary level	117	3 (15.8)
Class 6 - 10	185	46 (24.9)
Above class 10	19	41 (35.0)
Occupation of wife		
House wives	260	72 (27.7)
Working	61	18 (29.5)
Age of husband (in years)		
< 31	176	51 (29.0)
31– 35	99	25 (25.3)
> 35	46	14 (30.4)
Education of husband		
No schooling & Primary level	31	3 (9.7)
Class 6 - 10	200	54 (27.0)
Above class 10	90	33 (36.7)
Occupation of husband		
Unskilled	156	32 (20.5)
Salaried	56	25 (44.6)
Others	109	33 (30.3)
Duration of marriage (in years)		
1-3	216	64 (29.6)
> 3	105	26 (24.8)
Religion		
Hindu	235	69 (29.4)
Others	86	21 (24.4)
Type of family		
Nuclear	200	59 (29.5)
Extended	121	31 (25.6)

There is not much difference in Caesarean section by occupational status of wives. Among religious groups Hindu mothers (29.4%) are most likely to have delivered by Caesarean section. The difference in the proportion of deliveries by Caesarean section was around 4%, according to their family type.

Antenatal History of Mothers and Caesarean Section

Antenatal care (ANC) refers to pregnancy-related health care provided by a doctor or a health worker in a medical facility or at home. The safe motherhood initiative by policy-implementing authority (Ministry of Health & Family Welfare in India) proclaims that all pregnant women must receive basic professional antenatal care (Harrison 1990). So antenatal history has more importance in

pregnancy characteristics. Table 2 shows the percent distribution of first birth by Caesarean section in the five years preceding the survey by antenatal history of mothers. Forty percent of Caesarean sections occurred in private institutions, compared with 24.1% of Caesarean section in public institutions. While considering nutritional deficiency, Caesarean sections occurred significantly more among the women who had suffered nutritional deficiency during their pregnancy time ($p<0.05$). Women who suffered from any disease or any kind of reproductive health problem tended to deliver by Caesarean section. The percentage of Caesarean is significantly much higher for this group of women (more than 50%, $p=0.001$). Previous fetal wastage has no significant effect on Caesarean section in the southern part of Kerala.

Admission time for delivery has a significant effect on Caesarean section. Caesarean sections are more among women who admitted in hospital one day before delivery or the exact day of delivery. Caesarean sections are more common among women who delivered their baby after two years of their marriage.

Table 2: Percentage Distribution Caesarean Section by Antenatal History of Mothers

Antenatal History Variables	Total number	Number (%) of Caesarean section	Chi-square value	Odds ratio for having Caesarean section (95% confidence interval)
Type of hospital				
Government	241	58 (24.1)	7.56*	1
Private	80	32 (40.0)		2.6 (1.3-5.0)*
Nutritional deficiency				
No	288	76 (26.4)	3.77**	1
Yes	33	14 (42.4)		3.5 (1.4-8.7)*
Any disease during pregnancy period				
No	287	71 (24.7)	14.61*	1
Yes	34	19 (55.9)		3.6 (1.6-8.1)*
Previous fetal wastage			0.12	
No	24	6 (27.7)		1
Yes	297	84 (28.3)		1.3 (0.4-4.0)
Any Reproductive health problem				
No	253	49 (19.4)	44.49*	1
Yes	68	41 (60.3%)		7.8 (4.1-15.0)*
Admission time for delivery				
1 day before/delivery day	195	63 (32.3)	4.49**	2.2 (1.2-4.1)*
2 or more days before	126	27 (21.4)		1
First birth interval				
1 year	282	68 (24.1)	13.16*	1
> 1 year	39	22 (56.4)		5.4 (2.5-11.7)*

* $p < 0.01$

With multivariate logistic regression, all seven antenatal history variables considered for the model except previous fetal wastage have a significant relationship to Caesarean section. The odds for Caesarean section were significantly higher among the women who delivered their baby in a private hospital. The private institutions were 2.6 times more likely to perform Caesarean section than the public sector. The mothers with nutritional deficiency were 3.5 times more likely to have undergone Caesarean section than the healthy mothers. Mothers who were suffering with any kind of reproductive health problem during their delivery had higher odds of Caesarean section. Also the odds of Caesarean section were higher for mothers who delivered their first baby after two years of their marriage and those who were admitted for the delivery in a short period before their delivery date.

Discussion

Caesarean births were originally used as an emergency-birthing alternative for complicated births and labours that endangered either the life of the child or the mother. The Caesarean childbirth rate has increased dramatically in all parts of the world. According to the World Health Organization, no country is justified in having a Caesarean rate greater than 10 to 15%. However, the present study shows a much higher percentage of Caesarean section for the southern part of Kerala as compared to all of Kerala (13.7%) (IIPS 1995). According to the National Family Health Survey I & II, a rapid increase has taken place in the proportion of Caesarean section (IIPS 1995, IIPC and ORC, Macro 2000).

Caesarean section is major surgery, and brings with it many risks to both mother and baby. Babies born by C-section do not receive the natural stimulation that comes from moving down the birth canal, and therefore must often be given oxygen or a rubdown to help them breathe. They also miss out on the natural hormones that are released during vaginal birth to help the baby during his first moments of life (Mercola and Droege 2003). The National Population Policy adopted by the Government of India in 2000 reiterates the government's commitment to the safe motherhood programmes within the wider context of reproductive health (NPP 2000); the important thrust of the Reproductive and Child Health Programme is to encourage deliveries under proper hygienic conditions, under the supervision of trained health professionals, and thus save the life mother and child.

This study revealed that Caesarean section in the southern part of Kerala, in both rural and urban areas, is much higher than for the country as a whole. This paper formulated a model of Caesarean delivery in the southern part of Kerala with respect to the antenatal history of mothers. The model exposed that the women who had a poor experience in antenatal history had higher odds of Caesarean section than other women. Nutritional deficiency is also one reason for higher Caesarean section in this area. Nutritional deficiencies in women are often exacerbated during pregnancy because of the additional nutrient requirements of fetal growth. These deficiencies are a major threat to safe motherhood and to the health and survival of infants because they contribute to low birth weight, lowered resistance to infection and impaired cognitive development. The provision of iron and folic acid tablets to pregnant women to prevent nutritional anemia forms an integral part of safe motherhood services offered as part of reproductive and child health programmes. Every woman should accept the recommendation and consume 100 tablets of iron and folic acid during pregnancy.

Women who had suffered any kind of reproductive health problem or any kind of disease experienced a higher incidence of Caesarean section. Most of the delayed deliveries also ended up with Caesarean section in this region. Generally the delayed first birth by Caesarean section may be due to the previous fetal wastage, such as spontaneous abortion, disease or reproductive health problem during pregnancy period. But in this study, previous fetal wastage is not statistically significant for Caesarean section, so the second factor may be the main reason for the higher caesarean section in delayed deliveries.

The study supports the need for implementing a new strategy for eliminating reproductive health problems because absence of reproductive tract infections is essential for the reproductive health of both couples to meet their reproductive goals. Several studies have shown that many Indian women suffer from reproductive tract infections or often bear the symptoms of reproductive tract infections silently with out seeking health care (Santhya 2004), so it is relevant to take interventions to establish RTI/STI clinics at district/Taluk hospital level, provision for laboratory diagnosis of RTIs/STIs and screening and treatment of RTIs/STIs.

Caesarean sections conducted by private sector occur more often than those of public sector. Studies have also found that middle-class and upper-class women who have private physicians are more likely to have Caesareans because they develop closer relationships with their doctors. (Padmadas et al. 2000). There is reason to believe that the current Caesarean section rates are part of a rising trend. This cannot be attributed entirely to the rise in institutional deliveries alone because of the strong association between Caesarean sections and private sector institutions. It is possible that this extremely useful surgical procedure is being misused for profit purposes in the private sector in

several places, so it should be ensured that the Caesarean are done in an emergency situation only.

It is recommended that if the Caesarean is avoidable, physicians should be discouraged from delivery by Caesarean section. It is highly recommended that maternal educational programmes be directed to couples to provide scientific information on the problem of nutritional deficiency and reproductive tract infections. Recommendations include the action to encourage vaginal births among the couples.

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