Research Article

DOI: http://dx.doi.org/10.18203/2394-6040.ijcmph20163370

Caesarean section rate and its determinants in a rural area of South India

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Received: 03 August 2016 **Accepted:** 01 September 2016

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ABSTRACT

Background: The world is currently witnessing an increase in the rate of caesarean sections which can be ascribed to many factors including socio-demographic factors and personal preferences apart from the clinical indications. This study is done to assess the rate of caesarean section in rural Kerala of South India and to determine the factors associated.

Methods: A community based cross sectional study using a pretested semi-structured questionnaire was conducted among mothers who delivered between April 2011- march 2012 in a rural area of Thrissur district in Kerala, South India. Analysis was done using SPSS16.

Results: Rate of caesarean section is 37.7%. The major indications were previous caesarean sections (40.44%), failure of labor to progress (22.47%) and fetal distress (14.6%). Univariate analysis showed significant association between caesarean section and higher educational status of the women and husband, higher occupational status of the women and husband, and undergoing ultrasonography >3 times in the antenatal period. On multivariate analysis higher occupational status of women (OR [CI] =3.35 [1.03-10.8]), multiparity (OR [CI] =1.96 [1.05-3.6]), and >3 ultrasonograms (OR [CI] =2.05 [1.08-3.89]) were found to be significant risk factors.

Conclusions: Rate of caesarean section in present study is above the expected levels. Study brings out association of woman's occupation, parity and number of ultrasonography with caesarean sections. It is important to make the public aware regarding the benefits of natural births. Government level policies supporting normal deliveries should be advocated.

Keywords: Caesarean section, Vaginal birth after caesarean, Ultrasonography

INTRODUCTION

Caesarean sections are lifesaving procedures performed at face of risk to the mother or to the baby at time of birth. As per WHO guidelines there is no justification for any region to have a caesarean section rate of higher than 10-15%. There is an increasing trend in rate of caesarean sections across the world including India for past few years. Several studies conclude that many sociodemographic factors are influencing the decision making. A number of caesarean sections were performed because

of personal preferences apart from the clinical indications.^{2,3} In this background, this study is done with the objective of assessing the rate of Caesarean Sections in a rural area of Thrissur district in Kerala, South India and to find out the determinants of the caesarean sections in the same population.

METHODS

A community based cross-sectional study was conducted in Avanur panchayat of Thrissur District in Kerala, South India. Avanur panchayath is one of the field practice areas of Department of Community Medicine, Government Medical College Thrissur. Study subjects were women who delivered during the period of April 2011- March 2012 who satisfied the following criteria.

- Registered their last pregnancy in Primary Health Centre of Avanur panchayath.
- Given live births in their last delivery.
- Permanent residents of the panchayath.
- Given consent to participate in study.

The study was conducted from December 2012 to December 2013 over a period of one year. The sample size for a cross sectional study was calculated to be 233, where the prevalence of caesarean section was kept as 30%. The present study being a rate determining study, all deliveries that have occurred during the time period were included.

There were a total of 258 deliveries in Avanur panchayath during the period of one year, from April 2011-March 2012, all of which were live births. Names and addresses of the women who delivered in the period were retrieved from the primary health centre of Avanur panchayath, referring the Mother and Child Tracking System and Mother and Child Health register. All subjects were individually interviewed by house to house visits.

Women who could not be contacted even after 3 visits were considered as non-responders. Data regarding socio-demographic variables, self- reported morbidity status, details of previous deliveries and deliveries under the present study were collected using pre-tested semi-structured questionnaire. Medical documents including antenatal cards and discharge cards from hospitals were used wherever available to support the collected data.

Socio- economic status was assessed using Modified Udai Parikh scale. Height of the mothers was measured to find if there was any association between short stature and Caesarean Section. Data were collected in first four month of the study period. Out of 258 eligible subjects, 236 participated in study. Overall response rate was 91.47%.

Rate of Caesarean Sections in 2011-12=

Number of Caesarean deliveries in $2011 - 12 \times 1000$

Total number of live births in 2011 – 12 in Avanur panchayath

RESULTS

Mean age of women was 27.21±4.18 years. Majority of the participants were Hindus (72.8%). 40.7% women attained education of graduation or above. Among the husbands 20.7% attained education of graduation or above. There were 12.3% women who were employed among which 82.8% were professionals and office workers. 44.9% of the husbands were unskilled workers. Of all the study participants 79.2% belonged to middle

socioeconomic status. Out of 236 women, 110 (46.6%) were uniparous. Among 126 multiparous women, 34.1% underwent caesarean section in their previous pregnancy.

Details of delivery under study

There were 147 (62.2%) normal vaginal births and 89 (37.7%) caesarean sections. Of all 236 deliveries, 83 (35.2%) deliveries took place in government hospitals. 101 (42.8%) deliveries occurred between 8 am and 4 pm. Among the total 236 births which included two twin births, there were 132 (55.9%) male babies and 106 (44.9%) female babies.

Rate of caesarean section

Rate of caesarean section in Avanur panchayath in 2011-12 is 3.77 per 1000 live births (37.7%). Out of all 89 caesarean sections 49 (55.1%) were elective and 40 (44.9%) were emergency procedures. The major indications for Caesarean Sections were previous Caesareans (40.44%) followed by failure of labor to progress (22.47%) and fetal distress (14.6%) (Figure 1). The indications for elective and emergency caesareans sections are shown in figures (Figure 2 and 3).

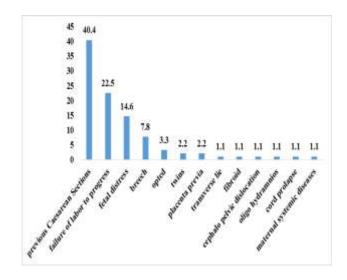


Figure 1: Indications for caesarean sections (%).

Determinants

Proportion of women undergoing caesarean section increased with acquiring education of graduation or above by the women and husbands (χ 2: 10.4 p=0.001, χ 2 =17.19 p=0.000 respectively). The women who were working as professionals, office workers or skilled workers had increased number of caesarean section compared to unskilled workers and housewives (χ 2:17.4 p=0.000). Husbands' occupational status also showed significant association with caesarean section (χ 2: 11.74 p=0.001). There is significant association observed between socio economic status of study participants and type of delivery. Women from high socio economic class were having high proportion (88.8%) of Caesarean

deliveries compared to middle (35.3%) and low (37.5%) socio-economic class (χ 2: 10.5, p=0.005). Details of various socio-demographic factors studied is shown in Table 1.

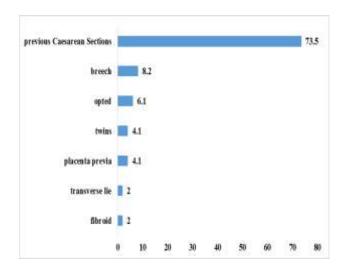


Figure 2: Indications for elective caesarean section (%).

Among various obstetric factors studied, there was no significant association observed between parity and the type of delivery in univariate analysis as the percentage of Caesarean Sections were comparable in uniparous (33.6%) and multiparous women (41.2%) (χ 2: 1.45 p=0.23). Multiparity was found to be a significant risk factor after multivariate analysis (Adjusted Odds Ratio=1.96, 95% CI=1.05-3.6). Prevalence of Caesarean Section was significantly different among those who had previous caesarean deliveries (93%) compared to those

who had previous vaginal deliveries (14.5%) among the multiparous women (χ 2:72 p=0.000). Proportion of caesarean section was significantly higher in women with >3 USG (51.8%) compared to those with \leq 3 USG (30%) (χ 2:10.82, p= 0.001). Details of various obstetric factor studied is given in Table 2.

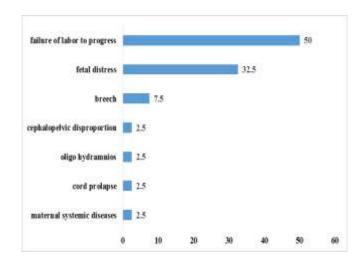


Figure 3: Indications for emergency caesarean sections (%).

Mean values of heights of the mothers and birth weights of the babies were also not significantly different among those who had vaginal deliveries and caesarean sections (Table 3). On multivariate analysis, higher occupational status of women, multiparity and >3 USG were found to be significantly associated with caesarean sections, adjusted Odds Ratio [CI] being 3.35 [1.03-10.8], 1.96 [1.05-3.6], 2.05[1.08-3.89] respectively.

Table 1: Association between socio-demographic factors and type of delivery.

Socio-demographic fact	ors	Caesareans No (%)	Vaginal No (%)	p value
Religion	Hindu Christian Muslim	67 (38.9) 17 (32) 5 (45.5)	105 (61) 36 (67.9) 6 (54.5)	0.52
Education (woman)	<u>></u> graduation <graduation< td=""><td>48 (50) 41 (29.3)</td><td>48 (50) 99 (70.7)</td><td>0.001</td></graduation<>	48 (50) 41 (29.3)	48 (50) 99 (70.7)	0.001
Education (husband)	≥graduation <graduation< td=""><td>18 (36.7) 129 (69)</td><td>31 (63.3) 58 (31)</td><td>0.000</td></graduation<>	18 (36.7) 129 (69)	31 (63.3) 58 (31)	0.000
Occupation (woman)	professional and skilled unskilled and housewives	19 (76) 70 (33.2)	6 (24) 141 (66.8)	0.000
Occupation (husband)	professional and business Skilled and unskilled	41 (53.2) 48 (30.2)	36 (46.7) 111 (69.8)	0.001
Socioeconomic status	High Middle Low	8 (88.8) 66 (35.3) 15 (37.5)	1 (11.2) 121 (64.7) 25 (62.5)	0.005
Type of family	Nuclear Joint Three generation	38 (46.3) 18 (33.3) 33 (33)	44 (53.7) 36 (66.7) 67 (67)	0.14

Table 2: Association between obstetric factors and type of deliver
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Obstetric factors		Caesarean No (%)	Vaginal No (%)	p value
Parity	Uniparous Multiparous	37 (33.6) 52 (41.2)	73 (66.3) 74 (58.7)	0.23
Comorbidity	Present Absent	6 (54) 83 (36.8)	5 (46) 142 (63.2)	0.2
Place of delivery	Private Government	66 (42) 23 (29.1)	91 (58) 56 (70.9)	0.053
Number of antenatal visits	≥4 <4	87 (37.8) 2 (33.3)	143 (62.2) 4 (66.6)	0.8
Number of USG	>3 ≤3	43 (51.8) 46 (30)	40 (48.2) 107 (70)	0.001
Gestational status	Preterm Term	2 (20) 87 (38.5)	8 (80) 139 (61.5)	0.23
Closeness to holidays/festivals	Yes No	19 (50) 70 (54.68)	19 (50) 128 (64.6)	0.8
Time of delivery	8am-4pm 4pm-8am	40 (40) 49 (36)	60 (60) 87(64)	0.53

Table 3: Comparison of birth weights of babies and maternal heights between mothers with vaginal deliveries and caesarean Sections.

Type of delivery	Birth weight (kg) Mean±SD	t value (p)	Height of mother (cm) Mean±SD	t value (p)
Caesarean	2.92±0.46	0.58	155.76±4.78	1.06
Vaginal	2.88±0.44	(0.56)	156.49±5.29	(0.28)

DISCUSSION

Along with the improvements in maternal and child health services, an increase in the caesarean sections is observed in rural Kerala as evidenced by the present study. Rate of caesarean section in the present study is 37.7/100 live births which is greater than the WHO guidelines. This rate is slightly higher than the result obtained in a study conducted in 3 major city corporations in Kerala where prevalence of Caesarean Sections is reported as 34.4%.⁵

In coverage evaluation survey by the UNICEF (2009), Kerala's proportion of Caesarean Section deliveries was 33.7%. The caesarean section rate observed in the present study is much higher than the national average obtained from different studies. According to the World Health Statistics 2014, the rate of caesarean section in India was 8%. It is one percent less compared to the rate observed in India as per World Health Statistics 2013 (9%). National Family Health Survey-3 (2005-06) gives the national average of Caesarean Section rate as 10.6 %.

In studies done by Unnikrishnan b et al at Mangalore (2009) and by Khairum Nahar (1996) in Mymensing Medical College Hospital Dhaka, the major indication for Caesarean Sections was previous Caesareans followed by fetal distress and obstructed labor. 9,10 In the present

study, elective Caesarean Sections were more when compared to emergency procedures, the commonest indication being previous Caesareans. None of the study participants who had previous Caesareans deliveries were informed about the possibility of a Vaginal Birth After Caesarean Section. Failure of labor to progress and fetal distress were next common indications for Caesarean Sections.

Ghosh S after consolidating the results of the three National Family Health Surveys, observed a higher number of Caesarean Section delivery among mothers with high educational background in India. 11 Present study also depicts such an association in univariate analysis. A significant association exists there between higher occupational status of women and Caesarean Sections. Similar association was also observed in a study conducted by Chancham AS and Perpetuo IHO. 12 Such association may be ascribed to the decision making power of employed women in their family, where they can plan their own health care, place and type of delivery. Such women also tend to postpone their first pregnancy by which they may end up as elderly primi who are in need of Caesarean delivery.

A study conducted by Jaspinder Kaur et al in Jalandhar, showed statistically significant increase in incidence of caesareans with an increase in parity.¹³

Present study established such association after multivariate analysis. This may be because of risk in pregnancy among multiparous women due to repeated deliveries or as a result of advancing age. Another possible explanation to this as observed in the present study is high number of previous caesareans among the multiparous women makes them eligible candidates for further caesarean sections.

Significant association observed between USG done >3 times and caesarean sections can be explained by the fact that pregnancy with complications are likely to have more number of USGs done. Similar result was obtained in the study by Hemachandran K in Kerala, where there was 19.5 times increased risk of ending up in Caesarean Section (OR=19.5 CI= 4.9-77) for number of USG >3 compared to single USG examination in pregnancy.⁵

In view of the increased rate of caesarean section, following recommendations are made to have a check on the situation. Public should be intensely made aware regarding benefits of natural delivery. Women with previous caesarean sections should be informed about the possibility of vaginal birth after caesarean section and given an option of choosing it after comparing its benefits and risks with repeated caesarean section. Hospital based clinical guidelines should be maintained for identifying failure of labor to progress correctly and to reduce unnecessary sections under this indication. Conducting monthly internal auditing to review delivery types and indications for caesarean sections in hospitals may also be helpful.

Assessment of trends in caesarean section rate and its indications at government and private hospitals should be made by clinical audits or peer reviews. Government level policy may be made to maintain optimal level of caesarean sections in hospitals and clinics under government and private set up. Government can formulate institutional guidelines for the same. Further studies from medical and multidisciplinary perspectives are recommended in this regard to help government in policy making and setting up of guideline.

CONCLUSION

Rate of caesarean section in present study is above the expected levels. Study brings out association of woman's occupation, parity and number of ultrasonography with caesarean sections. It is important to make the public aware regarding the benefits of natural births. Government level policies supporting normal deliveries should be advocated.

ACKNOWLEDGMENTS

Authors are grateful to all the respondents who participated in the study. The authors would also like to

thank the medical officer in charge and the field staff of primary Health Center, Avanur, for helping in locating the residence of the study participants.

Funding: No funding sources Conflict of interest: None declared

Ethical approval: The study was approved by the

Institutional Ethics Committee

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Cite this article as: Divyamol N, Raphael L, Koshy N. Caesarean section rate and its determinants in a rural area of South India. Int J Community Med Public Health 2016;3:2836-40.