

DOI: <http://dx.doi.org/10.18203/2320-1770.ijrcog20184140>

## Original Research Article

# Delivery by repeat caesarean section today: an overview

D. M. Christe<sup>1,2\*</sup>, Shaanthy T. K. Gunasingh<sup>2,3</sup>, V. Bharani<sup>2,3</sup>

<sup>1</sup>National Institute for Research in Human Reproduction, Field Unit, Indian Council of Medical Research, India

<sup>2</sup>Institute of Obstetrics and Gynecology and Government Hospital for Women and Children, Chennai, Tamil Nadu, India

<sup>3</sup>Department of Obstetrics and Gynecology, Madras Medical College, Chennai, Tamil Nadu, India

**Received:** 03 August 2018

**Accepted:** 01 September 2018

### \*Correspondence:

Dr. D. M. Christe,

E-mail: drdmchriste@gmail.com

**Copyright:** © the author(s), publisher and licensee Medip Academy. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

### ABSTRACT

**Background:** To find out the maternal and neonatal outcome and background characteristics of women delivering by repeat caesarean section in a tertiary care centre in Chennai, South India.

**Methods:** Parturition records for the year 2017, were accessed and case records, for the calculated sample size were selected. Demographic features, obstetric history, gestational age and antenatal complications were recorded. Maternal outcome and baby details including sex of the baby, birth weight, APGAR and admission to New born Intensive Care Unit (NICU) data and acceptance of postpartum contraception was noted.

**Results:** In the study group, 156 women delivered by repeat caesarean section. The age group of women ranged from 20 years to 38 years. Majority of 83.4% of women were Para one. Threatening rupture was recorded in 2.6% of women. The risk of previous two CS scars was noted in 3.2% of women. More than 41% of women had other complications. Most often observed complications were Gestational hypertension, Gestational diabetes, preeclampsia and eclampsia. Pregnancy complications of oligohydramnios, twins, breech and abnormal presentation, were significant. 1% of women had associated medical complications of anaemia and hypothyroidism. Maternal and Fetal causes were the most important indication for caesarean section in 74% of women. There were no maternal deaths in present study group. Postpartum contraception was accepted by 55 % of women.

**Conclusions:** Majority of repeat caesarean section was observed most commonly in para one women in the age group of 26-30 years More than 41% of women had associated medical and obstetric complications. There were no maternal deaths in this study. Neonatal deaths were 2.5%.

**Keywords:** Neonatal outcome, Obstetric complications, Repeat caesarean section

### INTRODUCTION

Remarkable improvements in maternal mortality and morbidity have been made possible by Caesarean section [CS].<sup>1</sup> But today the numbers of women delivering by CS has risen steeply, and repeat CS is often opted as the optimal method of delivery for best maternal and perinatal outcome.<sup>1,2</sup> Long term effects of caesarean section on both mother and baby need to be addressed, which brings to light the urgent need to bring down

caesarean section rates. From many studies that have been conducted recently, we understand that neonatal morbidity associated with elective cesarean delivery at term increases as gestational age at delivery decreases from 39 to 37 weeks.<sup>3,4</sup>

Even as every effort is taken to deliver at optimal timing, we can arrive at the best timing for delivery for both mother and baby, only by analyzing more obstetric case records.<sup>5</sup> To obtain a relevant information, regarding

maternal and neonatal outcome, in deliveries by repeat caesarean section, it was decided that it would be an acceptable method to select parturition records maintained in large obstetric institutions and in particular tertiary care referral centers.

We analysed the data of women delivering by repeat caesarean section, to find out the maternal and perinatal outcome, in the current situation. This could also throw some light on various factors which has caused the rise in the incidence of birth by caesarean section, and subsequently in almost, all cases repeat caesarean section, and to assess the maternal and neonatal outcome. This is a retrospective analytical study using data obtained from Parturition registers, for the calendar year 2017, to find out the maternal and neonatal outcome and background characteristics of women delivering by repeat caesarean section, in a tertiary care centre in Chennai, South India.

## METHODS

**Settings:** A tertiary referral obstetric centre with intramural NICU in Chennai, South India.

Tertiary referral Centres have admissions with numerous obstetric and medical complications. Majority of women are referred quite often late. We analyzed the parturition data of women delivering by repeat caesarean section, to find out maternal and perinatal outcome, in the current situation.

Approval for conducting this study was given by the institutional Ethics Committee, Institute of Obstetrics and Gynecology. Consent was not obtained from individual study participants as data was accessed from Medical records section only and was analyzed maintaining complete patient confidentiality.

### Selection of case records

The data from case sheets of pregnant women admitted for obstetric care in, Government Hospital for women and children, Institute for Obstetrics and Gynaecology (IOG) were scrutinized. The study period was one year from January 1st, 2017 to December 31st, 2017. Parturition records were accessed by selection of case records for the calculated sample size. The sample size was calculated for a study power of 80%, within a 95% limit, confidence interval. This was to reduce statistical errors and for obtaining relevant values for the tests of significance. To establish an appropriate selection, the dates of delivery of women, whose case records were selected for inclusion in the study, was selected as the first and second dates of each month, of the year. All twelve months were included in the selection. Selection of case records were from the first and second dates of each month, including all twelve months, of the calendar. The inclusion criteria were selection of only the parturition records, where delivery was by repeat caesarean section, conducted on the, selected dates

namely the first and second days of each month of the year 2017. The parturition records, of all other mode of deliveries, conducted, on the same days were excluded. The number of records selected was more than the calculated sample size but, it was accepted as this would enhance the power of the study. This was a retrospective analytical study. The demographic features, obstetric history, gestational age and antenatal complications, medical and obstetric, were noted. Maternal outcome and baby outcome, along with details of sex of the baby, birth weight, APGAR and admission to NICU were analyzed. Acceptance of postpartum contraception was also noted.

## RESULTS

In the study group, 156 women delivered by repeat caesarean section. Two women delivered twins. The age group of women ranged from 20 years to 38 years. 40.5% of women [n= 64] hailed from Rural background. Urban women formed the majority of 59.5% [n= 94] of women. The demographic profile of women who underwent repeat CS was as follows: Hindus formed the maximum group of 88.6% of women, Muslims nearly 7% of women and the remaining by Christians and other denominations (Figure 1).

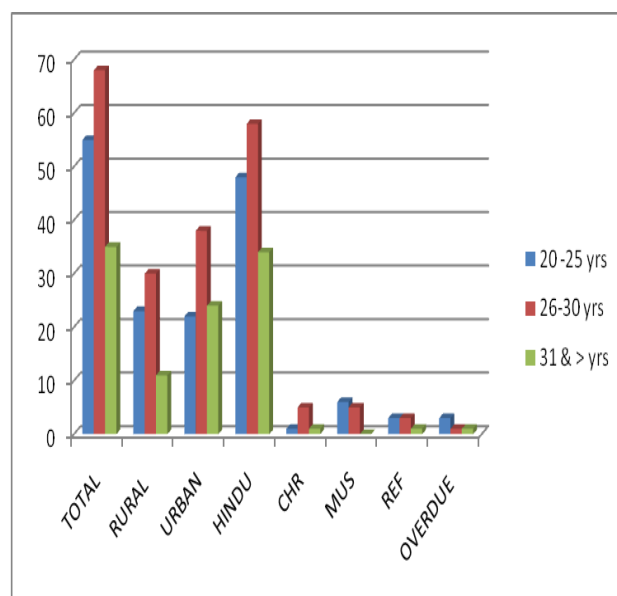
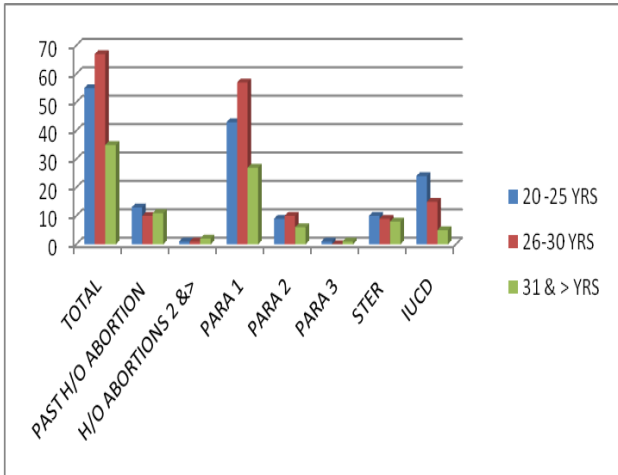


Diagram showing salient demographic features of women in all three age groups. The two columns on the far right show the numbers of women who were late referrals for delivery and the numbers of women overdue. Group I, Mothers aged 25 years and less N=55. Group II, Mothers aged 26-30 years, N= 67. Group III, Mothers aged 31 years and more N=35.

### Figure 1: Demographic features of women in the three groups.

At least 4.4% of women [n=7] were referred late for obstetric care. Past obstetric history of women recorded showed that the large majority of 83.4% of women were para one. Previous history of early pregnancy loss was recorded in a significant number of 21.5% of the total

group (Figure 2). It was important to note that 10.1 % of women gave past history of two or more incidences of early pregnancy loss. A large group of 15.8% of the total group of women were Para 2. A small number of two women were Para 3. Six women with previous CS scar who came to hospital for admission for delivery were overdue.



The Columns on left show, the numbers of women with Past history of abortions, and the next column, numbers of women with past history of two and more abortions. The next columns show the numbers of women according to parity. The two columns on the far right show the numbers of contraceptive acceptors, both IUCD and sterilization.

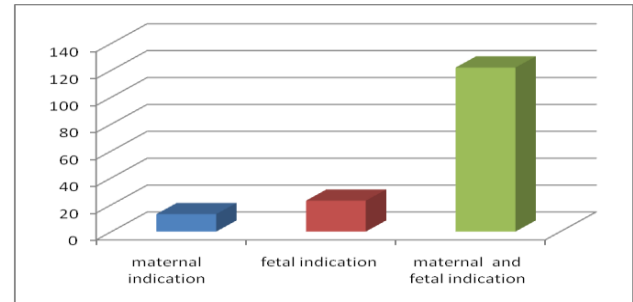
**Figure 2: Diagram showing past obstetric history of women in all three age groups.**

In addition to the risk of previous caesarean scar of uterus, a large number of women had associated complications. Threatening rupture was recorded in 2.6% of women. The risk of previous two CS scars was noted in 3.2% of women. More than 41% of women had associated medical, obstetric and in many more than one complication.<sup>5,6</sup> Pregnancy associated complications most often observed were Gestational hypertension, Gestational diabetes, preeclampsia and eclampsia.<sup>7,8</sup> Pregnancy complications of oligohydramnios, twins, breech and abnormal presentation were noted in a significant number of women.<sup>7-9</sup> Medical complications of anemia and hypothyroidism were associated risk factors recorded in 1% of women. Other complications were seizure disorders, antepartum hemorrhage, premature rupture of membranes and placenta previa. Maternal and Fetal causes were the most important indication for repeat caesarean section in 74% of women (Figure 3). In 17.7% of women it was due to fetal causes. There were no maternal deaths in present study group. Postpartum contraception, both temporary methods and permanent methods were accepted by 55 % of women.

**Perinatal outcome**

A total of 158 babies were born, including, two pairs of twins. Nearly 6.3% of babies [n=10] were preterm. Admission in new born intensive care [NICU] was

required for 9.5% of babies (Figure 4). Among the NICU admissions only one third of the babies were preterm. Just term babies delivered at gestational period of 37 weeks [259 to 265 days], formed the majority of two thirds of total admissions.<sup>10</sup> Only one full term baby, delivered at 40 weeks of gestation, required admission in NICU. Six babies born overdue were all alive, and healthy and none of these babies required admission in NICU.



Maternal and foetal causes were the largest indication for caesarean section.

**Figure 3: Indications for caesarean section.**

For comparison of neonatal outcome, we divided the total study population of mothers into three groups, according to maternal age.<sup>11</sup> Group I, with fifty-five women aged 25 years and below. Group II, with 66 women, aged between 26 and 30 years of age. Group III, with thirty-five women aged above thirty years.<sup>11</sup> The largest number of mothers were from Group II, aged between 26 to 30 years, followed by younger mothers from Group I aged 25 years and below. The highest average birth weight of 3 kg for term babies was from Group III.

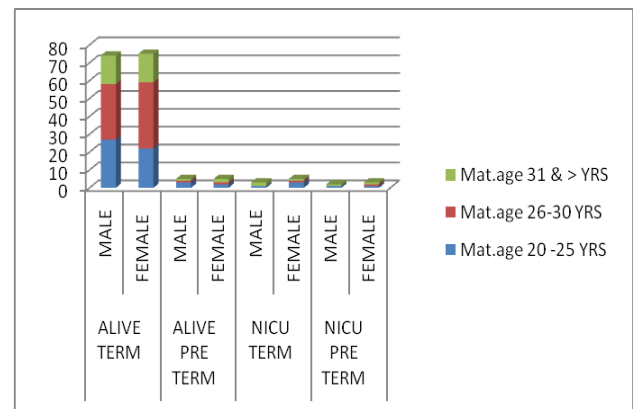


Diagram showing number of babies, both male and female born alive at term or preterm to women in the three age groups and the numbers of term and pre-term babies admitted in NICU.

**Figure 4: Diagram showing number of alive babies born, term and preterm and numbers admitted in NICU.**

The birth weight of preterm babies was comparable in the three groups of mothers.

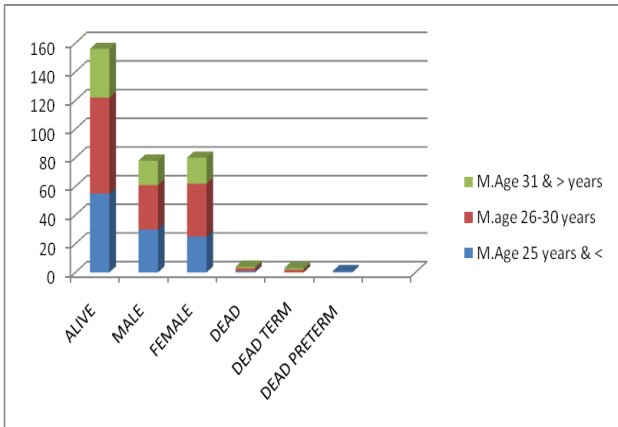
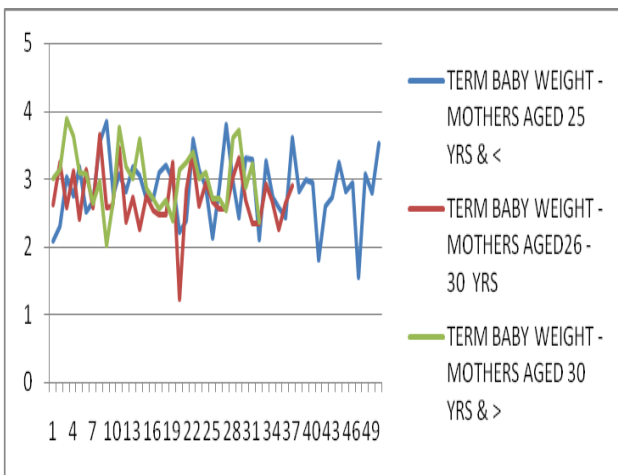


Diagram showing total number of babies, male and female born alive or dead or Died soon after birth, to women in all three age groups. The column one on the left shows the total number of babies who were born alive. Column two and column three show the total number of live born male babies and live born female babies born to women in all three age groups. The three columns on the far right show the total number of babies who were dead born or died soon after birth, to women in all three age groups.

**Figure 5: Perinatal mortality live births and still births/ died after birth**

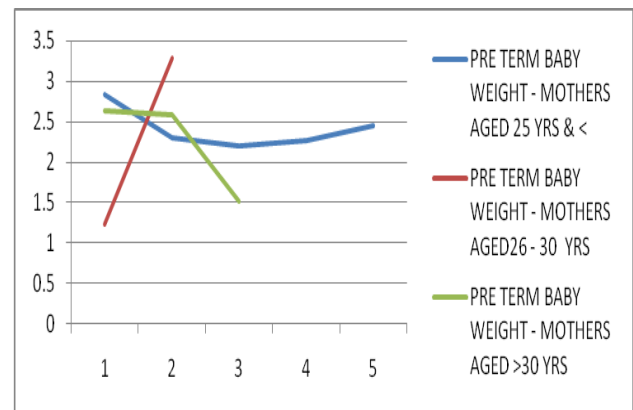


The average birth weight of term babies born to women aged above thirty years was highest. The average birth weight of term babies born to women aged between 26 years and thirty years of age was the lowest. Group I Mothers aged 25yrs and below Babies N=50 Av. BW 2.87 kg Group II Mothers aged 26-30 years, Babies N=37 Av BW 2.72 kg, Group III Mothers aged >30 years, Babies N=32 Av BW 3.02 kg.

**Figure 6: comparison of birth weight of all term babies born to women in the three groups**

In Figure 7, the graph shows that birthweight of preterm babies born to group I mothers was seen as a steady curve, though in the case of birthweight of preterm babies born to older mothers aged above thirty, the curve points down showing that though the average birthweight of preterm babies were comparable in all groups, that of, preterm babies of younger mothers aged 25 years and below was seen as a uniform steady curve as there were no extreme preterm babies born before 34 weeks of gestation in this group. Among preterm births, nearly 66% of babies were extreme preterm, and were born to older women, from group I and

II, aged 26 years and above. The average birth weight of preterm babies was 2.4 kg in Group I. This was the highest among the three groups Figure 6,7 Of four baby deaths, one was preterm, from younger mother in Group I. In all three term baby deaths, were recorded. The mothers were from older women Group II and III. Two baby deaths delivered at term, after 37 + weeks of gestation were recorded. One was an intrauterine death, whose mother had gestational diabetes, and the other whose mother had gestational hypertension<sup>12</sup>. One full term [281 days] baby death was recorded. The full-term baby died soon after birth. The mother was admitted with cord prolapse.



The birth weight of preterm babies was comparable in the three groups of mothers. The graph shows that the birthweight of preterm babies born to group I, with younger mothers showed a steady curve, though in the case of the birthweight of preterm babies born to mothers aged above thirty, the curve points down showing that nearly 66% of Preterm babies in Groups II and III were extreme preterm. Group I Mother aged 25 years and below Babies N= 5 Average birth weight 2.4 kg, Group II Mother aged 26-30yrs Babies N= 2 Average birth weight 2.3 kg, Group III Mother aged >30 years, Babies N=3 Average birth weight 2.3 kg.

**Figure 7: Comparison of birth weight of all pre-term babies born to women in the three groups**

**DISCUSSION**

Among women admitted for obstetric care, admissions of women from urban background were marginally more and formed 59 %, of the total. The risk factor of previous history of early pregnancy loss was recorded in a significant number of 21.5% of the total group. It was important to note that 10.1 % of women gave past history of two or more incidences of early pregnancy loss.<sup>6</sup> This is a major additional risk factor to be considered in women coming for delivery with previous CS scar. At least 25 % of women had past history of abortions. The maximum number with this risk factor were from older women aged above 30 years. The average birthweight among term babies was higher among babies born to older women.<sup>12</sup> In present study, among the women referred late for admission who formed 4.4 % of the total group, the, outcome of mother and baby were good. No baby required admission in NICU. One baby was preterm, and all others were term. This could be because of adequate antenatal care given prior to admission. It may be mentioned here that 50% of women in this group



had been treated for medical complications of anemia, gestational hypertension, and Gestational diabetes.<sup>13</sup>

Among the NICU admissions only one third of the babies were preterm. Just term babies delivered at gestational period of 37 weeks [259 to 265 days], formed nearly two thirds of the group requiring intensive new born care. Extreme preterm births were observed among older women above 26 years of age. The associated medical complication of hypothyroidism was noted in a majority of older women in Group II and III. This complication is often associated with poor progress of labour and adverse foetal heart rate changes, during labour. These complications usually influence, decision for safe delivery by Caesarean section as the optimal choice. The maternal and perinatal outcome of twins was good. Both pairs were delivered at 38 weeks. None required admission in NICU, stressing on the importance of antenatal advice and care for these mothers. Contraception choice of immediate postpartum IUCD was the accepted method among 64% of postpartum contraception acceptors.<sup>14-16</sup> In present study group, no woman who had undergone caesarean section previously was delivered vaginally.<sup>17</sup>

Women with previous caesarean section constitute a high-risk group in obstetrics. The elevated rate of caesarean section today has risen to considerable numbers which is a cause for concern.<sup>18</sup> Causes for this sharp rise in caesarean section deliveries should be investigated, and best measures to reduce the rate of caesarean delivery need to be formulated which should include assessing family background, cultural factors and other reasons, and bearing in mind long term effects of delivery by caesarean section.<sup>19,20</sup>

## CONCLUSION

Among women admitted for delivery with history of previous caesarean section, majority of more than 80% were Para one. The age group of women aged between 26 -30 years formed the largest group. Threatening rupture was recorded in 2.6% of women. The risk of previous two CS scars was noted in 3.2% of women. Associated medical and obstetric complications, and in many more than one, were recorded in, 41% of women. There were no maternal deaths in this study. Babies born overdue were all alive, and healthy. Extreme preterm births were observed in older women aged 26 years and above. Around 9.5% of babies born by repeat CS were admitted in NICU. Majority of babies which required admission in NICU were Just term. [ Gestational age 259 days]. Morbidity and mortality were highest in the group of Just term babies. Among 2.5% of perinatal deaths, there were more deaths observed among just term babies, which were delivered after gestational period of 37 weeks. A large number of 55 % of the group of women accepted postpartum contraception. Nearly 27.9% of women accepted postpartum IUCD and 17% accepted sterilisation.

*Funding: No funding sources*

*Conflict of interest: None declared*

*Ethical approval: The study was approved by the Institutional Ethics Committee*

## REFERENCES

- Melamed N, Hadar E, Keidar L, Peled Y, Timing of planned repeat cesarean delivery after two or more previous cesarean sections--risk for unplanned cesarean delivery and pregnancy outcome. *J Matern Fetal Neonatal Med.* 2014;27(5):431-8.
- Black M, Bhattacharya S, Philip S, Norman JE, McLernon DJ., Planned Repeat Cesarean Section at Term and Adverse Childhood Health Outcomes: A Record-Linkage study. *PLoS Med.* 2016;13(3): e1001973.
- Mascarello KC, Matijasevich A, Barros AJ, Santos IS, Zandonade E, Silveira MF., Repeat cesarean section in subsequent gestation of women from a birth cohort in Brazil. *Reproductive Health* 2017; 14(1):102.
- Balachandran L, Vaswani PR, Mogotlane R. Pregnancy outcome in women with previous one cesarean section. *Journal of clinical and diagnostic research: JCDR.* 2014;8(2):99.
- RCOG. Green-top Guideline Number 45 Birth After Previous Caesarean Birth. October 2015
- Gagliardi L. Pregnancy complications and neonatal outcomes: problems and perspectives. *Acta Paediatrica.* 2014;103(7):682-3.
- M. Kaplanoglu, A. Karateke, Burak Un, et al. Complications and outcomes of repeat cesarean section in adolescent women. *Int J Clin Exp Med.* 2014;7(12):5621-8.
- Nandini Naskar, Arakhita Swain, Kedar Nath Das and Abhaya Kumar Patnayak. Maternal Risk Factors, Complications and Outcome of Very Low Birth Weight Babies: Prospective Cohort Study from a Tertiary Care Centre in Odisha, *J Neonat Biol.* 2014;3(3):142.
- Malak M. Al-Hakeem. Pregnancy Outcome of Gestational Diabetic Mothers: Experience in A Tertiary Center. *J Family Community Med.* 2006;13(2):55-9
- Anggondowati T, El-Mohandes AA, Qomariyah SN, Kiely M, Ryon JJ, Gipson RF et al, Maternal characteristics and obstetrical complications impact neonatal outcomes in Indonesia: a prospective study, *BMC Pregnancy Childbirth.* 2017;17(1):100.
- Cavazos-Rehg PA, Krauss MJ, Spitznagel EL, Bommarito K, Madden T, Olsen MA, Subramaniam H, Peipert JF, Bierut LJ. Maternal age and risk of labor and delivery complications. *Maternal Child Health J.* 2015;19(6):1202-11.
- Blomberg M, Tyrberg RB, Kjølshede P. Impact of maternal age on obstetric and neonatal outcome with emphasis on primiparous adolescents and older women: a Swedish Medical Birth Register Study. *BMJ open.* 2014;4(11):e005840.

13. Pacagnella RC, Cecatti JG, Parpinelli MA, Sousa MH, Haddad SM, Costa ML, Souza JP, Pattinson RC. Delays in receiving obstetric care and poor maternal outcomes: results from a national multicentre cross-sectional study. *BMC Pregnancy Childbirth.* 2014;14(1):159.
14. Konar H, Sarkar M, Paul J. Perinatal Outcome of the Second Twin at a Tertiary Care Center in India. *The J Obstet Gynecol India.* 2016;66(6):441-7.
15. Chiwanga ES, Massenga G, Mlay P, Obure J, Mahande MJ. Maternal outcome in multiple versus singleton pregnancies in Northern Tanzania: a registry-based case control study. *Asian Pacific J Reprod.* 2014;3(1):46-52.
16. Goldstuck ND, Steyn PS. Insertion of intrauterine devices after cesarean section: a systematic review update. *International journal of women's health.* 2017;9:205.
17. Melamed N, Segev M, Hadar E. Outcome of trial of labor after cesarean section in women with past failed operative vaginal delivery, *Am J Obstet Gynecol.* 2013;209(1):49.e1-7.
18. Blanc-Petitjean P, Salomé M, Dupont C. Labour induction practices in France: A population-based declarative survey in 94 maternity units, *J Gynecol Obstet Hum Reprod.* 2018 ;47(2):57-62.
19. Magne F, Puchi Silva A, Carvajal B. The Elevated Rate of Cesarean Section and Its Contribution to Non-Communicable Chronic Diseases in Latin America: The Growing Involvement of the Microbiota, *Front Pediatr.* 2017;5:192.
20. Montoya-Williams D, Lemas DJ, Spiryda L. What Are Optimal Cesarean Section Rates in the U.S. and How Do We Get There? A Review of Evidence-Based Recommendations and Interventions, *J Womens Health (Larchmt).* 2017;26(12):1285-91.

**Cite this article as:** Christe DM, Gunasingh STK, Bharani V. Delivery by repeat caesarean section today: an overview. *Int J Reprod Contracept Obstet Gynecol* 2018;7:4127-32.