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ORIGINAL RESEARCH ARTICLE

A study of adverse feto maternal sequelae in relation to the previous caesarean deliveries

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ABSTRACT

Background: In this modern emerging world, the Caesarean section epidemic is spreading immensely and becoming a serious issue for which international attentions are very much required. Females who have previously undergone caesarean sections possess high risks in the group of Obstetrics followed with associated medical and legal complications which in turn can be fetal for both the mother and child. The main concern in these cases lies in that fact that a scarred uterus at times end up in rupturing the full uterus while leading to severe maternal as well as perinatal morbidity. **Methods:** This study was a Observational, Cross-Sectional Institution Based Study conducted in the Department of Obstetrics and Gynaecology, Nil Ratan Sarkar Medical College & Hospital, Kolkata, West Bengal, India from March 2021 to February 2022. 120 patients of previous caesarean deliveries admitted at N.R.S Medical College & Hospital to be included in the study. A suitable predesigned pretested Proforma for data collection was prepared. Routine Obstetric, menstrual, relevant past, personal and family history were also elicited. Template was generated in MS excel sheet and analysis was done on SPSS software. **Results:** History of previous caesarean deliveries was between 18-20years which was 36.67% followed by the age group between 21-25years was 45%. most common antenatal

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complications was APH due to placenta previa followed by scar dehiscence following scar rupture. LSCS was done in 100 cases and 20 cases went for VBAC, out of which difficulty in opening abdomen was encountered in 4 out of 100 number of the patients. the percentage of babies delivered by VBAC who were admitted to the NICU was 60% and the number of babies having delayed cry was 70%. Total NICU admission out of the 120 babies having APGAR Score below 5 was 28 and those who were not taken for the NICU admission was 92. **Conclusions:** From this study, we can conclude that the women with a prior caesarean section are at an increased risk of having repeated caesarean again for the current pregnancy. Hence the key for the reduction of the repeated caesarean section lies in the vigilance of the indications with respect to the primary caesarean delivery, proper counseling for trial of labor, and proper antepartum and intrapartum monitoring of patients

Keywords: Caesarean deliveries, complications, feto-maternal sequelae

INTRODUCTION

Both, attempting a vaginal birth and opting for an elective repeat caesarean section (ERCS) are associated with different risks for the mother and new born; and, deciding a delivery plan involves a difficult weighing of those cases.[1]

If there is any presence of a Caesarean scar, it affects the site of implantation as well as the distance between the implantation site. This in turn results in the increasing number of spontaneous abortion, scar dehiscence as well as morbid adherent placentae. Apart from these major causes, there are also some of the minor causes which might also become detrimental for the maternal health.[2,3]

A previous CS makes the greatest contribution to the overall rate of caesarean with a relative contribution ranging from 15.4% to 67.7%. A relative contribution of CS performed among nulliparous women to the overall CS rate varies from 17.2% to 41.6%. The notably high CS rates among nulliparous women may be associated with increased use of CS without medical indication and inappropriate induction of labour.[4,5]

Though the women who have already undergone previous caesarean sections constitute high risks in obstetrics which are already followed with associated medical and legal implications, and as we have already studied in the beginning that a scarred uterus has a high chance of ending up in rupturing the uterus which leads to severe maternal health issues.[2,6]

As a major surgical procedure, Caesarean Section not only predisposes short term adverse events to pregnant women, i.e. higher rates of haemorrhage, transfusions received, infections, prolonged hospital stays and in infants i.e. higher rates of infection, respiratory complications and admission to neonatal intensive care, but also long-term obstetric risks in the subsequent pregnancy such as placenta previa, morbidly adherent placenta, and uterine rupture. The risks of adverse outcomes following C-Section increase with an increased number of C-Section.[2,3,7,8]

In addition to increased risk of neonatal and perinatal mortality in vaginal birth after caesarean (VBAC), previous CS has been reported as being associated with adverse outcomes of

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subsequent pregnancies such as maternal mortality, blood transfusion, admission in critical care, and hysterectomy.[3,9,10]

There are also neonatal risks such as babies born via multiple repeat Caesarean section are more likely to experience breathing difficulties and to require admission to neonatal intensive care.[7,8,9,11]

With this background, this study intends to study the Study on the adverse effects and complications which are being faced by the mothers with a history of previous caesarean sections with reference to complications.

Method and Materials:

Study design : Observational, Cross-Sectional Institution Based Study.

Study setting: All the pregnant women admitted through the Out Patient Department (OPD) in indoor ward with the previous history of one or more caesarean section at the department of Obstetrics and Gynaecology, Nil Ratan Sarkar Medical College & Hospital. The study will start with the submission of research proposal. Aker receiving ethical committee approval the data collection will be done for the next 11 months. Analysis of data will be done for another 2-3 months and report writing will be done for another 2-3 months.

Period of study: 1st March, 2021 to 28th February, 2022

Study population : In The women with a previous history of one or more caesarean deliveries who were admitted to the indoor as patients in the department of Obstetrics and Gynaecology and also those who were. referred from peripheries according to the inclusion criteria and not included in the exclusion criteria.

Inclusion Criteria: All pregnant women with a history of one or more caesarean sections who were admitted to our ward at N.R.S Medical College & Hospital. (a) 37 weeks of pregnancy and onwards and (b) Emergency patients.

Exclusion criteria : Patients with previous history of Uterine Surgery or previous Myomectomy Scar, Multiple pregnancies, fetus with congenital anomaly and associated medical illness (Uncontrolled Diabetes Mellitus, Heart Disease, Thalassemia, etc).

Sample size : 120 patients of previous caesarean deliveries admitted at N.R.S Medical College & Hospital to be included in the study. Informed consent will be taken from the patients.

N= [{3.96 x P x (1_P)}/(I^2)]=7223/100=72.23

Where P= Prevalence of previous caesarean deliveries = 24% I= Allowable Error (absolute) = 10%.

72.23 ~ 72= Minimum Sample Size..

Method of data collection: Management protocol of Department of Obstetrics and Gynaecology at N.R.S Medical College & Hospital, Kolkata for the patients with a history of previous one or more LSCS were followed. A suitable predesigned pretested Proforma for data collection was prepared. Routine Obstetric, menstrual, relevant past, personal and family history were also elicited. General and obstetric examination of the patient was done. All relevant investigations such as ultrasound and pathological investigations were carried out. Special

ISSN:0975-3583,0976-2833 VOL13,ISSUE08,2022

attention were paid to the details of the previous caesarean section, complications encountered during the caesarean section, whether delivery was preterm/full term, whether baby was live born/still born and baby birth weight.

Definition of outcome: The outcome measures for mothers are: Uterine Rupture (with suture of ruptured uterus, abdominal hysterectomy), hysterectomy, postpartum haemorrhage (PPH), complicated PPH (with renal failure, arterial embolization, transfusion of blood/packed cells/blood expander), postpartum infection, admission to intensive care unit (ICU), manual removal of placenta, and stillbirth.

Statistical Analysis:

Data was entered into SPSS 20.0 (SPSS Inc Chicago IL USA). Analysis was based on intention to treat. Continuous variables have been assessed by Student's t test and Mann Whitney U test depending on the data normality. Categorical data has been assessed by chi square test. P value <0.05 has been considered to be statistically significant.

Ethical clearance: The study was conducted only after obtaining written approval from the Institutional Ethics Committee. Written informed consent was taken from every study patient or their logical representative.

Results

In present study, 120 obstetric patients with previous history of caesarean deliveries were admitted under our unit were chosen. It was a prospective, cross sectional and observational study. The time period for the study was from 1st March, 2021 to 28th February, 2022. In all the cases, thorough history taking and clinical examination was done after taking proper consent. They were followed up until they were discharged postpartum. Data thus obtained was noted in the Proforma. Results thus obtained were analysed and expressed in tables.

Table 1: Distribution of study population according to age, gravida/parity, POG of deliveries of previous pregnancy (weeks), mode of delivery.

Age in years	Number of cases	Percentage (%)
18-20	44	36.66%
21-25	54	45%
26-30	13	10.83%
31-35	6	5%
>35	3	2.5%
Total	**120**	**100**
Gravida/parity		
G2P1+0	79	65.83%
G4P2+1	4	3.33%
G3P2+0	33	27.5%
G3P1+1	4	3.33%

ISSN:0975-3583,0976-2833 VOL13,ISSUE08,2022

POG of deliveries of previous pregnancy (weeks)		
≤ 36	23	19.16%
≤ 37	33	27.5%
≤ 38	42	35%
≤ 39	19	15.83%
≤ 40	2	1.66%
> 40	1	0.833%
Mode of delivery		
Caesarean section	100	83.33%
VBAC	20	16.66%

In the present study of 120 case, the age between 18-20 years are 44(36.66%), 21-25years are 54 (45%), 26-30years are 13(10.83%) 31-35years are 6(5%) and greater than 35 years is 3 (2.5%). In this study the 4 Gravida/Parities we found in our study (120) cases. POG at the time of admission for the previous pregnancy while studying the cases for a sample of 120 cases, with the number of patients as per the weeks with their respective percentage. Out of those 120 patients, 40 were considered for the Trial of Labour (TOL) which the rest 80 were taken for Emergency Caesarean due to complications. Out of those 40, 20 had successful VBAC and the rest 20 had to be taken for Caesarean due to non-progress of labor. We can study the mode of delivery along with their respective percentages from this table (Table 1)

Table 2 : Distribution of study population according to indications for c-section of previous pregnancy vs no of patients and complain at the time of admission for current pregnancy vs no of cases.

Indications of CS for previous pregnancy	**Number of cases**	**Percentage (%)**
Persistent less fetal movement	39	32.5%
Fetal distress	18	15%
PROM with fetal distress	11	9.16%
Big baby	8	6.66%
Meconium stained liquor	10	8.33%
CPD	10	8.33%
PROM with MSL	1	0.833%
Contracted pelvis	8	6.66%
CPR<1	10	8.33%
Absent of end diastolic flow	5	4.16%

ISSN:0975-3583,0976-2833 VOL13,ISSUE08,2022

In the present study for performing the C-Sections, there needs to be certain indications. In this table, we study the indications for CS for previous pregnancy which were noted for the patients in the sample of 120 cases, along with the number of patient for each indication along with their respective percentages. (Table 2)

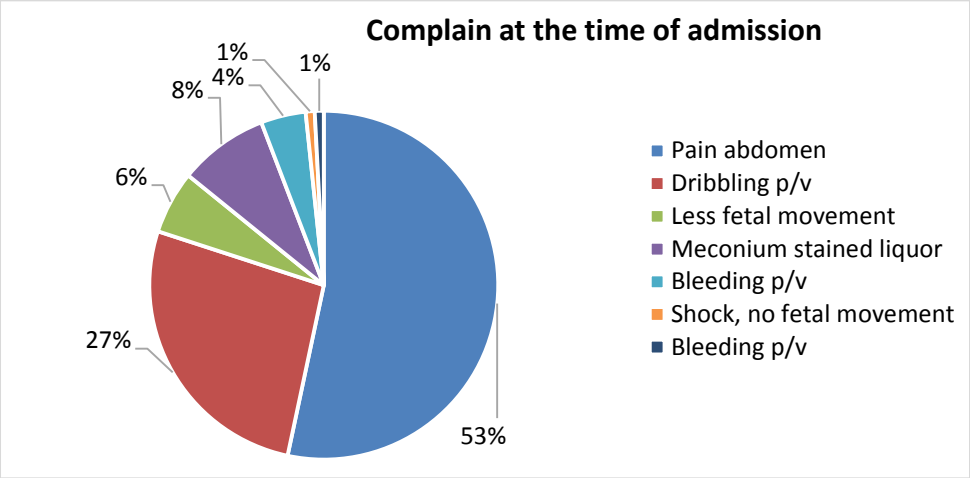
Table 3 : Distribution of study population according to no of living issue from previous pregnancy vs no of cases, inter delivery interval vs no of cases and POG at the time of admission for current pregnancy

Living issues	Number of cases	Percentage (%)
1 living issue	80	66.66%
2 living issues	40	33.33%
Inter Delivery Interval (in years)		
1	40	33.33%
2	62	51.66%
3	15	12.5%
4	3	2.5%
POG at the time of admission for current pregnancy (in weeks)		
37 weeks	8	6.66%
≤ 38 weeks	84	70%
≤ 39 weeks	28	23.33%

From the study we can conclude that in most case, the living issue is either 1 or 2 with the number of cases and their respective percentages. the inter delivery interval from the previous pregnancy to the current pregnancy along with the number of cases and their respective percentage. POG at the time of admission for the current pregnancy which is always ≥ 37 weeks out of those 120 sample of cases which were taken for this study. Hence we see the number of cases and the POG at the time of admission for the current pregnancy along with their respective percentages from this table. (Table 3)

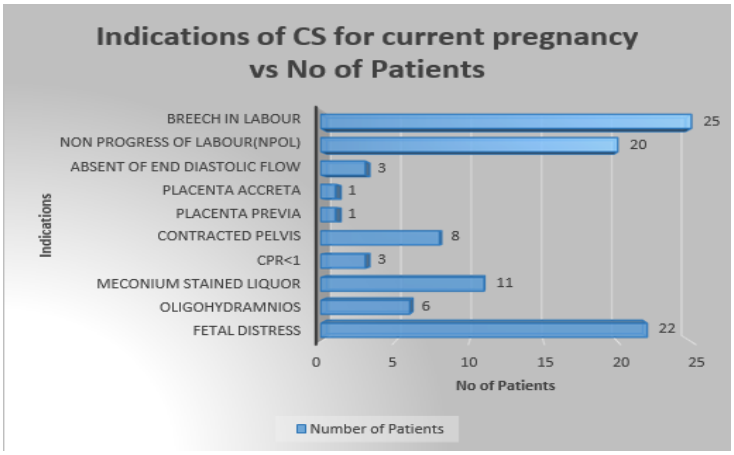
ISSN:0975-3583,0976-2833 VOL13,ISSUE08,2022

Figure 1 : Distribution of study population according to complain at the time of admission for current pregnancy vs no of cases.



From the above figure we conclude the conclusion which are being observed for the 120 sample of cases for this study along with the no of cases and their respective percentages. Some of these complications we pain in the abdomen, dribbling p/v, MSL, bleeding p/v etc. (Figure 1)

Figure 2 : Distribution of study population according to indications for C-section for current pregnancy vs no of cases.



From the above figure we conclude that for any C-section which is performed, there need to be certain indications like fetal distress, MSL, Contracted pelvis, Placenta previa, Placenta accreta, NPOL etc. From this table we can conclude the different indications which were considered for the 120 patients out of 100 who were taken for the C-Sections along with the indication for each patient. Hence by studying the table w.r.t the indications and the no of cases, we attain the percentage found for each indication out of those 120 samples. (Figure 2)

ISSN:0975-3583,0976-2833 VOL13,ISSUE08,2022

Table 4 : Distribution of study population according to intra-operative findings, intraoperative management requirement, puerperium phase post-delivery and duration of hospital stay.

Intra operative Findings (CS)	Number of cases	Percentage (%)
Difficulty in opening abdomen	4	4%
Wound extension	5	5%
Loop around the cord	7	7%
Dense adhesions with guts and parities	20	20%
Scar dehiscence	2	2%
Meconium stained liquor	5	5%
Intraoperative management requirement		
Blood Transfusion	9	9%
Obstetrics hysterectomy & blood transfusion	5	5%
Puerperium phase post delivery		
Non Specific	97	80.83%
Puerperal Sepsis	5	4.16%
Cervical tear	2	1.66%
Wound Gap	8	6.66%
Perineal Tear	1	0.83%
Received BT	1	0.83%
Vulvar Hematoma	2	1.66%
PPH	4	3.33%
Duration of hospital stay		
3 days	5	4.17%
4 days	1	0.83%
5 days	66	55%
7 days	20	16.66%
10 days	28	23.33%

From this table we can conclude the findings we were found for the patients who were taken for the C-sections. Each of the Intra Op finding during the surgery can be hence studied from this table along with the number of cases in which they were encountered with their respective percentage. Intraoperative management requirement which is mostly the blood transfusion and the Obstetrics Hysterectomy and BT which was done for the patients out of those 120 samples as per their requirements along with their respective percentages. Some of the complication which were encountered for the 120 samples along with their respective percentages as per the number of cases like puerperal sepsis, cervical tear, perineal tear, vulvar hematoma etc. Hospital stay for the patients along with their respective percentages which depends on the

ISSN:0975-3583,0976-2833 VOL13,ISSUE08,2022

complications of the patients. The more serious is the complication, duration of stay is more. (Table 4)

Table 5 : Distribution of study population according to status of previous baby at birth, birth weight, APGAR score at 1 min and 5, and NICU admission.

Status of previous baby at birth	Number of cases	Percentage (%)
Living, cried	63	52.50%
Living, delayed cried	52	43.33%
Non living	5	4.17%
Birth weight		
< 2 kgs	1	0.83%
2 kgs-2.5 kgs	50	41.67%
2.6 kgs-3 kgs	51	42.50%
3.1 kgs-3.5 kgs	18	15%
APGAR score at 1 min		
4-5	28	23.33%
6-7	8	6.67%
8-9	84	70%
APGAR score at 5 min		
4-5	28	23.33%
6-7	8	6.67%
8-9	84	70%
NICU admission		
Yes	28	23.33%
No	92	76.67%

Present baby at birth for those 120 samples along with their respective percentages which depends on the status for the no of cases. Here we mostly observe the living status of the baby along with their cry whether it is right on time or delayed. Birth weight of the baby during the present pregnancy along with their percentages for the 120 sample of cases. Here we have grouped the birth weight into the categories of below 2kgs, 2-2.5kgs, 2.6- 3kgs, 3.1-3.5kgs and so on and have calculated the percentage as per the number of cases for each group. APGAR Score is very essential for the neonates and hence from this table we can study the APGAR Score of the babies which were born for the 120 cases of patients along with their percentages. Usually with an APGAR Score below 3 is low where 4-6 is moderately abnormal and that of 7-10 is reassuring. Here as per our observations, we have grouped into three categories the APGAR score for 1 min that is 4-5 for the NICU admission, 6-7 and 8-9 for not the cases to be taken for NICU admission. Hence we see the number of cases for each category along with their respective percentages. APGAR score for 5 min that is 4-5 for the NICU admission, 6-7

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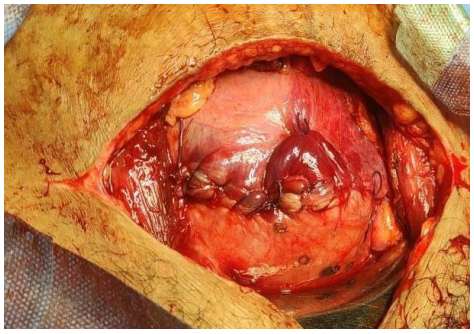
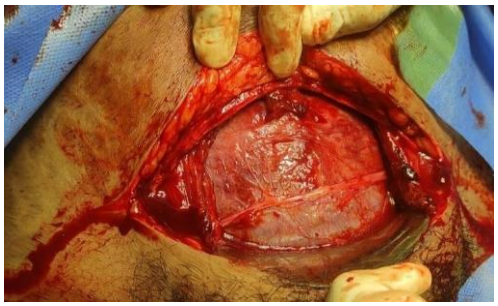
and 8-9 for not the cases to be taken for NICU admission. Hence we see the number of cases for each category along with their respective percentages. (Table 5)



Repair in the uterus during difficulty of opening abdomen

Difficulty in opening abdomen



DISCUSSION

The most frequent age group being admitted under our unit with history of previous caesarean deliveries was between 18-20years which was 36.67% followed by the age group between 21-25years was 45% and the age group between 26- 30 years was 10.833%, and between 31-35 was 5% and that of above 35 was 2.5%. Range of the age was between 18-36 years.

Majority of the patients admitted were from lower socioeconomic status group and belonged to either class 4 or class 5 of Modified BG Prasad's classification for 2017 is 77.5% of the patients belong to low socioeconomic status and 22.5% patients were middle socioeconomic status.

From the study, it was seen than 40 cases which is 33.33% conceived again with 1 year of previous caesarean section, 62 cases which is 51.66% conceived after 2years of previous caesarean section, 15 cases which is 12.5% conceived with 3 years of previous c-section and 3 cases which is 2.5% conceived after 4 years of previous C-section.

The success rate of VBAC in our study was found to be 16.66% where patients underwent caesarean sections, underwent for the trial for VBAC but few required emergency caesarean section because of fetal distress, cord prolapse, nonprogress of labor. Few cases had successful VBAC with all live deliveries.

As evident from the study, the most common antenatal complications was APH due to placenta previa followed by scar dehiscence following scar rupture or APH. Maternal death was 0.

LSCS was done in 100 cases and 20 cases went for VBAC, out of which difficulty in opening

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abdomen was encountered in 4 out of 100 number of the patients. Adhesions with guts and parities were seen in 20 out of 100 number of the patients. Wound extension was seen in 5 out of 100 number of patients, loop around the cord was seen in 7 out of 100 patients, Scar dehiscence was seen in 2 out of 100 patients and MSL was seen in 5 out of 100 patients.

Now as per the percentage calculations 4% has difficulty in opening the abdomen which performing the caesarean section. Again 20% percentage of the total number of patients had dense adhesions with guts and parities. The percentage faced wound extension during the caesarean section was 5%. Again out of the 100 patients, 1 suffered from Placenta Previa and 1 suffered from Placenta Accreta. Hence the percentage for the Placenta Previa and the Placenta Accreta becomes 1% and 1% respectively. Scar Dehiscence was seen in 2 patients out of the 100 patients. Hence the percentage becomes 2%.

Wound Extension was found in 5 patients which according to the percentage calculations become 5%. Loop around the cord was found in 7 patients out of those 100 LSCS which is 7%. Meconium Stained Liquor was encountered in 5 patients which is 5% w.r.t the 100 LSCS. Out of the 120 patients who were admitted, complains during the admission encountered in 120 cases were pain abdomen, dribbling p/v, less fetal movement, MSL, bleeding p/v, shock, no fetal movement, bleeding p/v, shock.

Out of those 120 patients, 64 suffered from pain in abdomen during the admission which was 53.33%, dribbling p/v was in 32 patients which was 26.66%, less fetal movement was in 7 patients which was 5.83%, meconium stained liquor was in 10 patients which was 8.33%, bleeding p/v was in 5 patients which was 4.167%, shock with no fetal movement was found in 1 patient which was 0.8333% and bleeding p/v with shock was found in 1 patient which was 0.8333%. Some required Intraoperative management requirements which were mostly Blood transfusion and Obstetrics Hysterectomy with Blood transfusion.

So going by the percentage, 9% required Blood transfusion out of those 100 cases of LSCS and 5% required Obstetrics Hysterectomy with Blood Transfusion out of those 100 cases of LSCS. Again Puerperium complications were observed in few of those 120 patients out of which puerperal sepsis, cervical tear, wound gap, perineal tear, Received BT, vulvar hematoma, PPH were observed. So going by the percentage of calculation, 80.83% had non- specific symptoms, 4.16% had puerperal sepsis, 1.66% had vulvar hematoma, 1.66% had cervical tear, 6.66% had wound gap, 0.833% had perineal tear, 3.33% had PPH and 0.833% received BT.

The total number of successful VBAC out of 120 cases were 20. So as per the percentage calculation it was 16.66%. Out of those successful VBAC, in 2 of the cases, the complication of cervical tear was faced. So the percentage of cervical tear for the VBAC was 10%. Out of those 20 successful VBAC, 1 had perineal tear and 2 had vulvar hematoma. So the percentage of perineal tear was 5% and vulvar hematoma was 20% w.r.t 20 successful VBAC. Out of the successful deliveries done by VBAC, 12 of the babies had an APGAR Score of 5 or below and were admitted to NICU and 14 had delayed cried. So the percentage of babies delivered by VBAC who were admitted to the NICU was 60% and the number of babies having delayed cry was 70% w.r.t to 20 successful VBAC cases.

ISSN:0975-3583,0976-2833 VOL13,ISSUE08,2022

The duration of hospital stay for VBAC without cervical tear, delayed cry or NICU admission was 3days. In case of Caesarean sections, the duration of hospital stay with nonspecific symptoms was 5days. The duration of hospital stay for caesarean section for complications like puerperal sepsis was 7days, wound infection was 10days, vulvar hematoma was 5days and cervical tear was 10days. The babies having a APGAR Score of 7 or above were not admitted to NICU but the babies having a APGAR Score below 5 or below were taken for the NICU admission. Total NICU admission out of the 120 babies having APGAR Score below 5 was 28 and those who were not taken for the NICU admission was 92. So the percentage of the babies taken for NICU admission was 23.335 and not taken for NICU admission was 76.667% w.r.t the 120 cases.

CONCLUSIONS

Undoubtedly we can state that trial of labor is relatively a safe procedure but it is not completely risk free. There patient evaluation prior to TOLAC with careful observations throughout the labor in a well- equipped unit with the clock services for any emergency surgery and availability of expertise is the backbone for the successful VBAC. At times a number of patients decline the process of trial of labor in spite of being eligible for it. Factors which keep influencing the outcome of trial of labor depends on the history of vaginal delivery, maternal age, weight of the baby, the interconceptional period. Smaller babies and older scars are more favorable for VBAC. Also identifying the high risks pregnancies for the uterine rupture and their timely referral from the grass root level is an important step in secondary prevention. Also an early diagnosis and prompt treatment for the rupture uterus is the most important factor to be considered in improving maternal and perinatal outcome

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Ethical approval: The study was approved by the institutional ethics committee

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