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Research Article

Outcome of post caesarean pregnancy and comparison of maternal and foetal outcome following vaginal birth versus repeat caesarean section in a rural hospital

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ABSTRACT

Background: The study was performed to assess the maternal and fetal outcome in post caesarean pregnancy as well as the various indications of a repeat caesarean section, so that, a definite protocol can be designed for selection of patient who is fit to undergo trial of labour after a previous caesarean section. This can reduce the rate of repeat caesarean section.
Methods: This prospective observational study was carried out in the Department of Obstetrics and Gynaecology at Acharya Vinoba Bhave Rural Hospital, Sawangi, Wardha, India from August 2010 to July 2012.
Results: During this period, a total 100 study cases with previous caesarean section were studied, of which 51 cases were selected for trial of vaginal delivery. 51 study cases were given trial of labour out of which 31 delivered vaginally. VBAC success rate at our institution during our study period was 60.78%. Out of total 69 cases who underwent caesarean section, maximum study cases presented with fetal distress 17(24.64%). Total 37 study cases were delivered by emergency caesarean section, maximum 17(45.94%) had indication of fetal distress followed by scar tenderness in 7(18.91%) cases.
Conclusion: Substantial reduction in the caesarean rate can be achieved safely and efficiently by encouraging the trial of labour in women with a single previous caesarean delivery. Caesarean section should not be always followed by repeat caesarean section but patients must have hospital delivery in well equipped hospital and complications should be diagnosed at an early stage so that we can prevent maternal/ perinatal mortality and morbidity.

Keywords: Vaginal birth after caesarean section, Trial of labour after caesarean section (TOLAC), Lower segment caesarean section, Repeat caesarean section, Maternal morbidity

INTRODUCTION

In today's situation when the access to obstetric care is growing day by day, there has been a concern over the rising caesarean rates over the world.[1] The Caesarean section epidemic is a reason for immediate concern and deserves serious international attention.[2]

The introduction of lower segment caesarean section gave a good and strong scar to the uterus, to hold and safely deliver a subsequent pregnancy. It is now safe to say that

"Once a caesarean section, always a hospital delivery"[3]

In an appropriate clinical setting and properly selected group of women, VBAC offers distinct advantages over a repeat caesarean section, since the operative risks are completely eliminated, the hospital stay is much shorter and expenses involved are much less. Trial of labour after previous caesarean delivery (TOLAC) provides women who desire a vaginal delivery with the possibility of achieving that goal-a vaginal birth after caesarean delivery (VBAC).[4] Although neither route is risk-free, the crucial issue is to ensure better maternal and perinatal

outcomes. Deciding when to attempt VBAC is a major decision and should be based on careful selection of patients after thorough counselling, estimation of patient's risk of uterine rupture and strict adherence to the most recent guidelines for managing labour, in units where there are facilities for immediate access to surgery, if complications arises.[5]

This study was carried out to assess the maternal and fetal outcome in post caesarean pregnancy as well as the various indications of a repeat caesarean section, so that, a definite and safe protocol can be designed for selection of patient who is fit to undergo trial of labour after a previous caesarean section.

Aim and objectives

- To determine outcome of pregnancy in mothers having history of one previous caesarean section in terms of mode of delivery i.e.
  - Vaginal birth after caesarean section
  - Elective caesarean section
  - Emergency caesarean section
- To determine the success rate and safety of vaginal delivery after a previous caesarean section (VBAC).
- To compare the maternal morbidity following repeat caesarean section and vaginal birth after caesarean section.
- To compare the foetal outcome following VBAC and repeat caesarean section.

METHODS

This prospective observational study was carried out in the Department of Obstetrics and Gynaecology at ACHARYA VINOBA BHAVE RURAL HOSPITAL, SAWANGI (WARDHA), India from August 2010 to July 2012 The ethical approval was taken from the Institutional Ethics Committee (IEC).

Inclusion criteria

1. Obstetric cases having history of previous one caesarean section.
2. Obstetric cases scheduled for delivery during study period.

Exclusion criteria

1. Obstetric cases with history of vaginal delivery with no history of even one caesarean section.
2. Obstetric cases with history of more than one caesarean sections.

Obstetric cases with history of previous one caesarean section, admitted to the obstetric wards, were included. Cases were selected randomly, using simple random sampling method with the help of random number table. Hence total 100 cases were studied during two year period. Firstly, the preliminary details in the form of demographic characteristics such as name, age, address, educational and socioeconomic status, date of admission and indoor registration number were noted. A suitable predesigned pretested proforma for data collection was prepared. Routine obstetric, menstrual, relevant past, personal and family history was also elicited. General and obstetric examination of the patient was done. All relevant investigations such as ultrasound and relevant pathological investigations were carried out.

Special attention was paid to the details of the previous caesarean section such as indication 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. Out of 100 cases, with history of previous caesarean section, eligibility of the patient for giving TOLAC was checked. Case selection for the trial for vaginal delivery was done as per following criteria:

- Singleton pregnancy.
- Gestational age >36 weeks.
- History of previous one lower segment caesarean section.
- Non recurrent indication for the previous lower segment caesarean section.
- Clinically adequate pelvis.
- No other uterine scars or history of previous rupture.

Informed valid written consent was taken, explaining the risk factors involved in TOLAC and they were explained that patient may require emergency caesarean section, anytime during labour. Those women with previous one lower segment caesarean section for the non recurrent indication and those who fulfilled the criterion according to the ACOG GUIDELINES (2004) were given a trial of labour .Those women, who refused for TOLAC and those were not eligible candidates for VBAC, were posted for elective caesarean section.

Maternal outcome in the present pregnancy, in the form of mode of delivery whether spontaneous or induced were noted. Those patients, who required repeat caesarean section in present pregnancy, their indications for caesarean section were noted and indications of those patients who required operative vaginal delivery were also noted.

Antepartum, intrapartum and postpartum complications were noted in all patients those who delivered vaginally and by caesarean section.

Neonatal outcome in present pregnancy as, whether the baby is live or still born, full term or preterm, baby birth weight, Apgar score of baby at one minute and five minutes, NICU admission, whether baby had any congenital anomalies and if there is any neonatal mortality, cause of mortality and number of days of admissions at NICU, all these data were included. All the data, so acquired was arranged and scrutinized

statistically. The data was analyzed and the final results of pregnancy outcome and risk factors were listed.

Statistical analysis

Continuous variables (Age, birth weight) were presented as Mean±SD. Categorical variables were expressed in percentages. Continuous variables were compared by unpaired t-test. Categorical variables were analysed by chi-square statistics. For small numbers, Fisher exact test was applied wherever required. p <0.05 was considered as statistical significance. The software used in the analysis were SPSS 17.0 version and Graph Pad Prism.

RESULTS

During the study period, a total number of 100 women were included in this study who were admitted with history of one caesarean section. Table 1 shows that of the total 100 cases study, 32 cases were taken directly for elective caesarean section. These cases, included 4cases who were not willing for trial of labour.17 cases, who were not fulfilling the criteria of trial of labour were taken directly for emergency caesarean section including those who had foetal distress on admission. 51 cases, out of 100 cases were given trial of labour. Out of 51 cases who were given trial of labour, 31 (60.78%) were delivered vaginally and remaining 20 (39.21%) cases had failed trial of labour and required emergency caesarean section.

Table 1: Distribution of study cases according to the outcome.

Mode of delivery	Number of Patients (n=100)	Percentage (%)
Elective repeat caesarean section	32	32.00
Emergency caesarean section those were not fulfilling the criteria of trial of labour	17	17.00
Trial of labour(n = 51)		
Vaginal birth	31	60.78%
Failed trial requiring emergency caesarean section	20	39.21%

VBAC success rate at our institution during our study period was 60.78% (Table 2).

In the present study, 37 study cases underwent emergency caesarean section, maximum 17(45.94%) had indication of fetal distress followed by scar tenderness in 7(18.91%), impending eclampsia in 3(8.10%), eclampsia in 2(5.40%) 2 cases had failure to progress, Complete Placenta Previa in 2(5.40%) and cord prolapse, MPOC, IUGR and scar dehiscence were the indications in 1 (2.70%) study case each as depicted in Figure 1.

Table 2: VBAC success rate at our institution during our study period.

No. of study cases with previous LSCS	No. of study cases undergoing trial of labour	Total no of VBAC	VBAC success rate
100	51	31	60.78%

In the study, 18 study cases had history of previous one vaginal delivery. Out of which 12 (66.66%) cases had vaginal delivery and only 6(33.33%) cases had caesarean section. Thus, mode of delivery in present pregnancy was significantly associated with history of one previous vaginal delivery (p=0.0003, significant) as depicted in Figure 2.

Figure 3 demonstrates that the morbidity due to emergency caesarean section was higher as compared to elective caesarean section and vaginal birth after caesarean section. Fig. 3 shows that blood transfusions were given to 27 patients, which include only 4 study cases (14.81%) who delivered vaginally, 17 (62.96%) study cases were delivered by emergency caesarean section and 6 (22.22%) study cases were delivered by elective caesarean section. In present study, the morbidity due to emergency caesarean section was higher. According to statistical analysis this difference was found to be statistically significant (p value=0.04, significant).

Atonic PPH was found maximum in emergency caesarean section i.e. 12 (32.43%) cases while only 5 (16.12%) study cases delivered vaginally had atonic PPH and 2 (6.25%) cases who underwent elective caesarean section had atonic PPH. Statistically this difference was found to be significant (p value=0.019).

Scar dehiscence was present in 5 study cases, delivered by emergency caesarean section and a single case had scar dehiscence who was delivered by elective caesarean section. This was found to be statistically significant (p=0.046, significant).

In the present study, total 69 cases were delivered by caesarean section, 66 (95.65%) were live birth and 3 (4.35%) were still births, while in vaginal delivery all 31 study cases had live births. This difference was statistically insignificant (p value=0.23, Not significant) as depicted in Table 3.

On analyzing Apgar score at 5 minutes in neonates after elective caesarean section, it was found as 28 (87.50%) had Apgar score above 8 and only 4 (12.5%) had Apgar score between 7-8. In neonates who were delivered with emergency caesarean section, 15 (44.11%) neonates had Apgar score in the range of >8,12 (35.29%) had score in the range of 7-8, 5 (14.7%) neonates had Apgar score in range of 5-6, 2 (5.81%) neonates had Apgar score in the

range of 3-4 and 0 (0.00%) neonates had Apgar score less than 3. After vaginal delivery 20 (28.99%) neonates had Apgar score above 8, 5 (7.25%) neonates had Apgar score between 7-8, 4 (12.90%) neonates had Apgar score between 3-4 and 2 (6.45%) neonates had Apgar score between 3-4. This difference was found to be statistically significant (*p* value<0.001, S) as shown in Figure 4.

Table 4 shows that, out of 27 neonates who required NICU admissions, only 3 neonates were delivered by elective caesarean section (9.37%) while 24 (64.86%) neonates out of 37 neonates delivered by emergency caesarean section required NICU admissions. This difference was found to be statistically significant (*p* value<0.0001, Significant).

Table 3: Distribution of neonatal outcome in the study cases.

Neonatal outcome	Caesarean section	Vaginal delivery	Total
Live birth	66(95.65%)	31(100%)	97(97%)
Still births	3(4.35%)**	0(0%)	3(3%)
Total	69(69%)	31(31%)	100(100%)

** Out of 3 stillbirths, only 1 study case was taken for emergency caesarean section after failed trial of labour while the other was taken for emergency caesarean section without giving trial of labour in view of scar dehiscence, in the third case the patient was taken up for emergency LSCS in view of foetal distress but the baby succumbed in the meanwhile and was delivered as a fresh still birth.

Table 4: Distribution of neonates who required NICU admission.

NICU admissions	Caesarean section		Vaginal delivery	Total
	Elective	Emergency		
Yes	3 (9.38%)	24 (64.86%)	14 (45.16 %)	41 (41%)
No	29 (90.63%)	13 (35.14%)	17 (54.84 %)	59 (59%)
Total	32 (100%)	37	31 (100%)	100 (100%)
ᵡ2-value	67.30, *p*<0.0001, Significant			

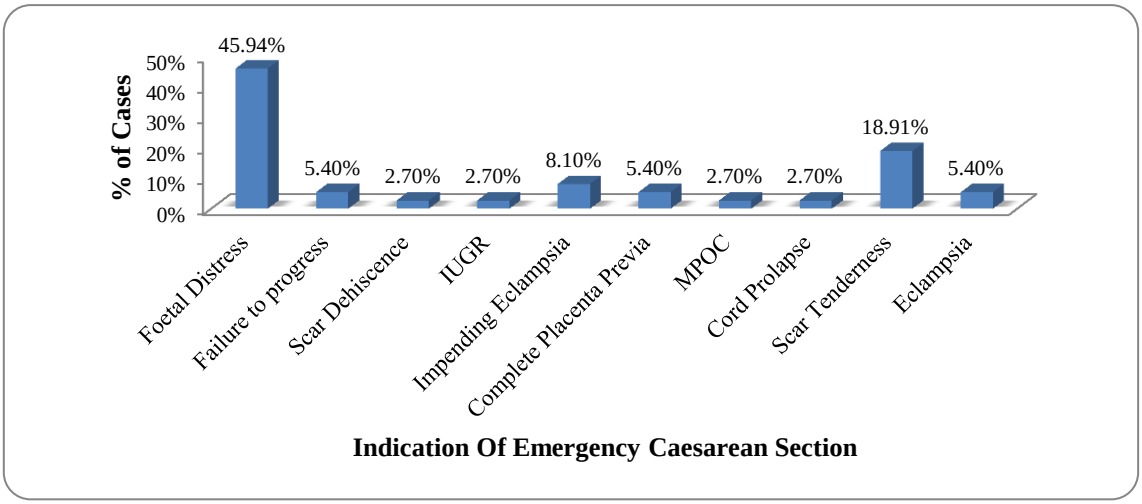

Figure 1: Distribution of study cases according to the indications of emergency caesarean section (those who were not fulfilling the criterion for TOL and those who had failed TOL).

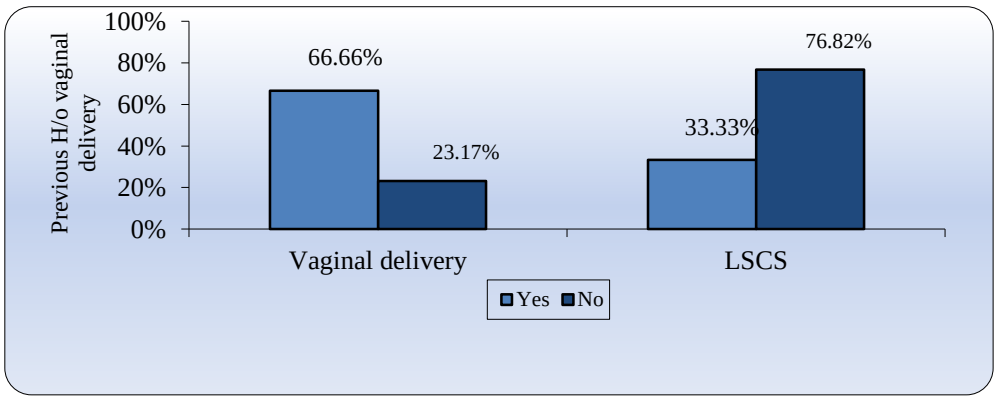

Figure 2: Mode of delivery in present pregnancy according to previous history of one vaginal delivery.

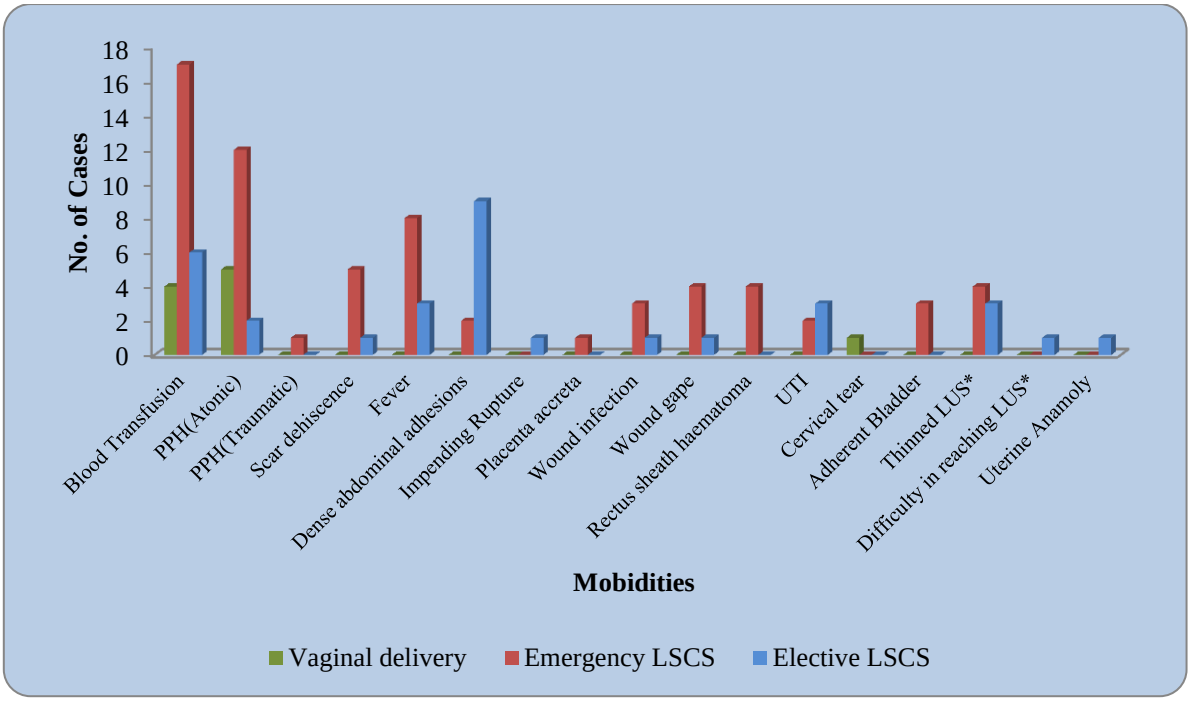

Figure 3: Distribution of the study cases according to complications and morbidities.

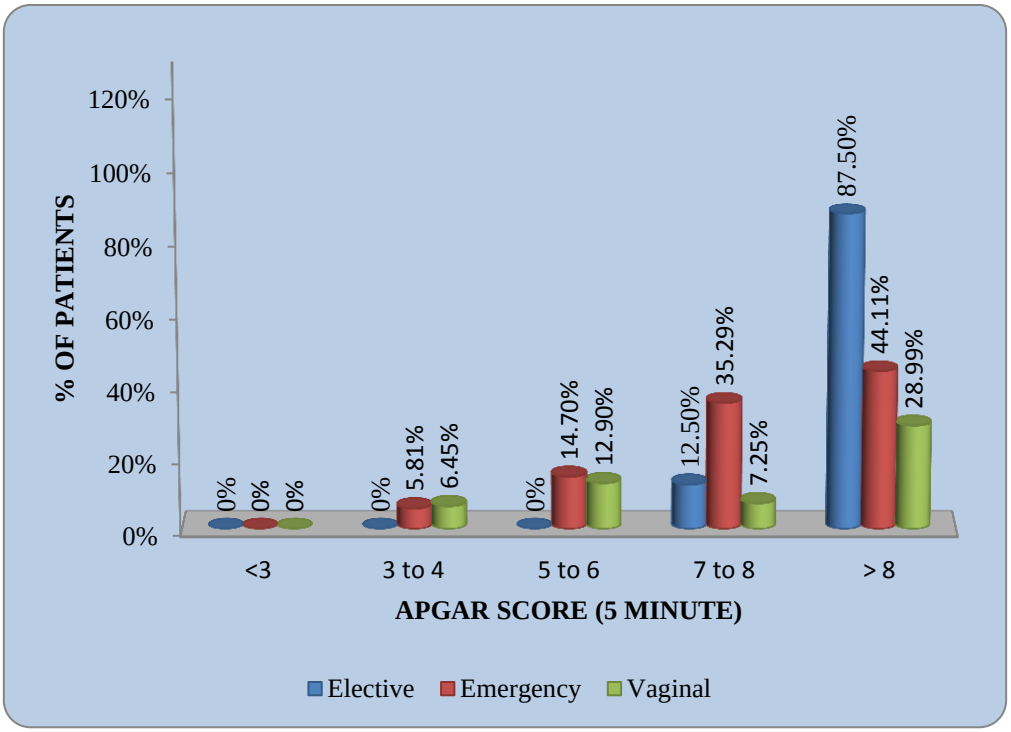

Figure 4: Distribution of neonates according to Apgar score at 5 minutes.

DISCUSSION

In the present study, total 100 cases were included with one previous caesarean section, 32 cases were taken directly for elective caesarean section, 51 cases were given trial of labour and remaining 17 cases were not fulfilling the criteria of trial of labour and they required emergency caesarean section without undergoing trial of labour. Out of 51 cases of TOL, 31 (60.78%) were delivered vaginally and remaining 20 (39.21%) cases had failed trial of labour and required emergency caesarean section. Our results were comparable to other studies of

Andrea B. Pembe et al (2010)[6], Bhat BPR et al (2010)[7], Pramod Kumar et al (2012).[8]

The success rate of vaginal birth after caesarean section in present study was 60.78%. 51 study cases were given trial of labour out of which 31 delivered vaginally. VBAC success were comparable to the studies of OC Ezechi et al (2005)[9], Tripathi JB et al (2006)[10], Bhat BPR et al (2010)[7] Pramod Kumar et al (2012).[8]

Attempts at vaginal delivery were abandoned, at that very moment, when there was even a bit suspicion of scar dehiscence and also to avoid neonatal morbidities resulting due to non reassuring foetal heart rate pattern. This discrepancy in various studies reflects the difference in the inherent nature of obstetric population and the difference in the protocol applied for selection of cases.

In our study, 37 study cases underwent emergency caesarean section, maximum 17 cases (45.94%) had indication of fetal distress followed by scar tenderness in 7 (18.91%), impending eclampsia in 3 (8.10%), eclampsia in 2 (5.40%), complete placenta previa in 2 (5.40%) and cord prolapse, MPOC, IUGR and scar dehiscence were the indications in 1 (2.70%) study case each. Thus foetal distress was the commonest indication for emergency repeat caesarean section which was also evident in different studies like Vardhan Shakti et al (2006)[11], Iqbal Begum et al (2004)[12], Bhat BPR et al (2010)[7], Shah Jitesh Mafatlal et al (2010).[13]

It was seen that success of mode of delivery in present pregnancy was significantly associated with history of one previous vaginal delivery (*p* value 0.0003, significant). Our results are well comparable with reported studies of Caughy AB et al. (1998)[14], Landon (2005)[15], Doshi Haresh et al (2010)[16], Shah Jitesh Mafatlal et al (2010)[13] concluding that patients who had a successful VBAC following a caesarean section have a very good chance of another successful VBAC.

In our study, on analysing, the incidence of maternal morbidities associated with different modes of delivery, it was found that morbidity was maximum, in patients who underwent emergency caesarean section, more so, after a failed trial of labour.

In the present study, total 69 cases were delivered by caesarean section, 66 (95.65%) were live birth and 3 (4.35%) were still births, while in vaginal delivery all 31 study cases had live births. This difference was statistically insignificant (*p* value=0.23, Not significant) Out of 3 still births, only 1 study case was taken for emergency caesarean section after failed trial of labour in view of thick meconium stained liquor with foetal distress while the other 2 were taken for emergency caesarean section without giving trial of labour in view of scar dehiscence and foetal distress respectively. Patient was taken for emergency caesarean section without giving trial of labour in view of scar dehiscence and in the third case the patient was taken up for emergency LSCS in view of foetal distress but the baby succumbed in the mean while and was delivered as a fresh still birth. Both of these cases were unbooked cases and they came with jeopardised foetal condition. Cause of neonatal still birth as given by paediatrician in both the above cases were congenital anomalies non compatible with life. Our study was comparable to Bhat BPR et al (2010)[7], reported in their study that emergency caesarean section was associated with 20% perinatal morbidity as compared to 16.4% for vaginal delivery and 1.8% for elective repeat caesarean section on the contrast in a study by Smith GC et al (2002)[17] found that delivery related perinatal death was 12.9/10000 women who had a trial of labour after previous section, the rate was 11 fold greater than the risk associated with planned repeat caesarean section.

In our study, no still birth was seen in patients who had VBAC while it was seen that still births occurred in cases who were taken for emergency caesarean section .Thus, demonstrating that patients who have failed TOL are at increased risk of jeopardised foetal conditions and operative interference should be made in time if complications like foetal or maternal distress comes into the picture.

Most of the neonates, who were delivered by emergency caesarean section, were taken to NICU for observation, as most of the emergency caesarean sections were done in view of foetal distress and failure to progress and also most of the neonates who had vaginal birth after caesarean section were admitted in NICU for observation.

Majority of neonates were having NICU admission due to premature rupture of membranes, meconium stained liquor, low birth weight and respiratory distress syndrome. Our study was well comparable with studies of Jha M et al (2009)[18] and Shah Jitesh Mafatlal et al (2010)[13] and Kamath BD et al (2009)[19] who found that Infants born after successful VBAC (36%) had the lowest rates of NICU admission and the lowest resuscitation needs; those born by failed VBAC (13%) had the highest resuscitation needs.

In the management of patient with previous caesarean section, regular and intensive antenatal surveillance is required. Proper selection, appropriate timing and suitable methods of induction with close supervision by competent staff are necessary. There is no doubt that a trial of labour is a relatively safe procedure but it is not risk free. Trial of scar in patients with one previous caesarean section is almost always safe in institutions which have good quality of care and should be given in institutions capable to provide comprehensive emergency obstetric care. To conclude, an expectant attitude and individualization with respect to the management of pregnancy and labour in patients who had one caesarean section is not only justifiable, but represents sound and conservative obstetrical practice. Substantial reduction in the caesarean rate can be achieved safely and efficiently

by encouraging the trial of labour in women with a single previous caesarean delivery.

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