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Original Research Article

A Comparative Study of Primary Caesarean Section in Primigravida and Multigravida in a Tertiary Care Hospital in Shillong, Meghalaya

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Abstract

Background: Caesarean section when indicated is a life saving procedure but when performed without appropriate indications can add risk to both the mother and baby. However over the past 15 years it has been noted that the incidence of caesarean section has doubled all over the world, different regions having different caesarean rates which has become a serious public health issue as morbidity and mortality from an unindicated caesarean section is more than from a vaginal delivery. The present study was done as there are no studies conducted in Northeast, India and in the tribal population to know the rate of primary caesarean section in primigravida & multigravida and to know the aspects which need due attention in either group (primigravida or multigravida) which can be differentiated for better obstetric management. ***Aim & Objectives:*** 1) The primary objective is to compare the rate of primary caesarean section in primigravida and multigravida. 2).The secondary objective is to compare the indications, maternal complications, early neonatal outcome in primigravida and multigravida. ***Material and Method:*** Study population- This study consisted of two groups, group A consist of 160 primigravida who fulfil the inclusion and exclusion criteria. Similarly, group B consist of 160 multigravida who fulfil the inclusion and exclusion criteria. Inclusion criteria**:** 1) All primigravida (booked and unbooked) with gestational age more than 37 weeks and above who have come for delivery. 2) Multigravida upto gravida 5 with gestational age of more than 37 weeks and above who has had one previous viable vaginal delivery. Exclusion criteria**:** 1).Patient with nonviable pregnancy 2) Patient not willing to participate in this study. 3) Patient having previous history of myomectomy or hysterotomy. 4) Gravida 6 and above as they are prone to complications. ***Results:*** The overall incidence rate of primary caesarean section rate in this study is 58.75% in primigravida and 31.87% in multigravida. Maximum patients who underwent primary caesarean section were in the age group 20-25years and 25-30 years for both groups. Maximum of the patients were posted for emergency caesarean section 96.8% in primigravida and 94.1% in multigravida. Foetal distress was the commonest indication 54.95% in primigravida and cephalopelvic disproportion 47.92% in multigravida. Intra-operative complications were common in both groups. In multigravida PPH 77.3% was more common. However uterine wound extension 80% was more common in primigravida. The overall post-operative complications were more common in multigravida (25.49%) compared to 13.82% in primigravida. Early neonatal outcome was good in both the groups. There was only 1 neonatal death during the study period in group B. ***Conclusion:*** As we have witnessed an increased rise in the rate of caesarean section over the past few years it is our responsibility to bring out the change and modifications and note that the indications indicated for caesarean section should be genuine. From this study, we can also see many females having no antenatal check-up which we can help by creating awareness and importance of antenatal check-up and should train doctors for timely referral of patients to avoid unnecessary complications. The need to better improve skills of obstetricians and staff to read CTG, perform ECV, perform instrumental deliveries especially in second stage of labour, proper counselling of patients and availability of labour analgesia to decrease the rate of caesarean on request. The overall reduction in caesarean rate can only be reduced if the indications of primary caesarean sections can be analyzed.

Keywords: Primary caesarean section, Primigravida, Multigravida, maternal and early neonatal outcome.

INTRODUCTION

Caesarean delivery defines the birth of a fetus through laparotomy followed by an incision in the uterus i.e hysterotomy to deliver out alive or dead fetus after the period of viability. Caesarean delivery is of two types [1]:-

1. **Primary caesarean section** - refers to a first time hysterotomy [2].
2. **Secondary caesarean section** - denotes a uterus with one or more prior hysterotomy incisions [2].

Caesarean delivery may be classified as:-

1. **Emergency caesarean section** – when it is carried out to ensure safety of the mother and child when vaginal delivery is not possible.
2. **Planned/elective caesarean section** - when the doctors consider the danger to the mother and the baby would be greater with a vaginal delivery.
3. **Postmortem caesarean section** [3] –delivery of a viable fetus after the death of the mother.
4. **Perimortem caesarean section** [3] – delivery of a viable fetus from a pregnant woman with cardiac arrest. It is an emergent delivery within 4 minutes of initiation of cardiopulmonary resuscitation (CPR).

Caesarean section can be performed before labour, during the first and second stage of labour [4]. Caesarean section when indicated is a lifesaving procedure but when performed without appropriate indications can add risk to both the mother and baby. However over the past 15 years it has been noted that the incidence of caesarean section has doubled all over the world, different regions having different caesarean rates which has become a serious public health issue as morbidity and mortality from an non indicated caesarean section is more than from a vaginal delivery. This increase in caesarean rate also adds to the financial stress of the family and the country economically.

Initially it was performed mainly for maternal interest but recently the health of the fetus has played a significant role in making the decision for caesarean birth [5]. A rising trend of caesarean section has been noted with the advancement of technological gadgets for fetal monitoring like USG reporting of severe oligohydroamnios. Doppler studies like absent or reversal of diastolic flow, better operative techniques and anaesthesia over the years, availability of blood products for transfusion and better neonatal facilities which can support a preterm baby. Many factors have also been cited for the increase in caesarean rate, which include delayed child bearing, multiple gestation, maternal request and physician's fear of litigation [6, 7] A decrease in the rates of operative vaginal delivery has been observed with a corresponding increase in caesarean deliveries during second stage of labour [5].

Delivery by caesarean section is most frequently performed in nulliparous for fetal distress, dystocia with suspected cephalopelvic disproportion. The indications for primary caesarean section in a multigravida are fetal distress, malpresentation which is favoured by a pendulous abdomen and lordosis of lumbar spine which is usual for the head not to engage in the pelvis until the onset of labours [8, 9].Cephalopelvic disproportion is also a common indication in multigravida since the fetus increases in size with multiparity. The most common indication for caesarean section in second stage of labour is obstructed labour due to cephalopelvic disproportion.

The rate of caesarean section is expressed as a percentage calculated by dividing the number of caesarean deliveries over the number of childbirths in a specific time period in a specific geographic area [10]. Since 1985, the international healthcare community has considered the ideal rate for caesarean section to be between 10% -15%. A figure below 5% implies that a substantial proportion of women do not have access to surgical obstetric care; on the other hand a higher rate than 15% indicates over utilization of the procedure for other than life saving reasons (WHO 1985) [11].

According to NHFS-4, 2015 (National Family Health Survey of India) [12], 40.9% of deliveries in private facilities were through C - Section as against 11.9% in the public sector. In Meghalaya the caesarean rate is 31.4% in the private sector compared to 9.8% in the public sector (NHFS-4). Based on data from DHLS-4 (District Level Household Survey data 4) [13], the prevalence of CS birth were 13.7 % (95% CI; 13.0-14.0%) and 37.9% (95% CI; 36.7-39.0%) in the public and private sectors respectively.

Caesarean section may be associated with short term and long term risks. Short term maternal risks associated with caesarean section include haemorrhage, injury of urogenital or gastrointestinal organs, post-operative infection and an increased risk of deep venous thrombosis. The long terms complications include increased risks of severe antepartum haemorrhage following uteroplacental complications such as placenta praevia and placenta accrete and uterine rupture in subsequent pregnancies. Newborns may face problems like Neonatal Respiratory Distress Syndrome including Transient Tachypnea of Newborn and Persistent Pulmonary Hypertension [5].These risks are higher in women with limited access to comprehensive obstetric care.

The rate of caesarean section delivery continues to increase despite efforts to constrain operative abdominal deliveries. This is a cause for concern because caesarean section is associated with higher likelihood of adverse outcome for both mother and fetus as compared to vaginal delivery [4]. Therefore, primary caesarean section deliveries are an important target for reduction in numbers, as they lead to an increased risk for repeat caesarean delivery.

Our present study aims to find out the differences in incidence, indications, fetal and maternal complications of primary caesarean section in primigravida as compared to multigravida. This study also tries to find out the ways for reducing the primary caesarean delivery. Primary caesarean section is of much obstetric significant as scar over the uterus changes the future obstetric outcome of a woman. This study is important and relevant as it aims to understand the factors which lead to primary caesarean since high parity and big family size is a norm in this part of the

region. The total fertility rate in Meghalaya is >2.2 according to NHFS - 4 [12]. Hence, this study will be relevant to find out the in incidence of primary caesarean section in Nazareth hospital, Shillong.

AIM AND OBJECTIVES

Primary objective

- To compare the rate of primary caesarean section in primigravida and multigravida.

Secondary objectives

To compare the following parameters in primigravida and multigravida:

- Indications
- Maternal complications
- Early neonatal outcome

MATERIALS AND METHODS

Study area

The present study was done in the Department of Obstetrics and Gynaecology, Nazareth Hospital, Shillong. The hospital provides services to both urban and rural patients belonging to the districts in proximity to Shillong. Nazareth Hospital is an entry level NABH accredited hospital which has more than 400 beds out of which 75 beds are of obstetrics and gynecology. Each year approximately 2,500 deliveries take place in Nazareth hospital. This hospital offers tertiary and referral services to the nearby districts. The hospital has a level III NICU with 15 beds.

Study population

Booked and unbooked primigravida and multigravida with gestational age more than 37 weeks and above who have come for delivery.

Study design

Prospective comparative study.

Duration of study

August 23, 2018 to April 23, 2019 (9 months).

Inclusion criteria:

- All primigravida (booked and unbooked) with gestational age more than 37 weeks and above who have come for delivery.
- Multigravida upto gravida 5 with gestational age of more than 37 weeks and above who has had one previous viable vaginal delivery.

Exclusion criteria

- Patient with nonviable pregnancy.
- Patient not willing to participate in this study.
- Patient having previous history of myomectomy or hysterotomy.
- Gravida 6 and above as they are prone to complications.

SAMPLE SIZE CALCULATION

The sample size was estimated based on the difference in proportion of caesarean section between primigravida and multigravida groups. Proportion of caesarean section in primigravida was 21.8% and in multigravida was 9.81% from the study by Shrutee Birla *et al*. This study was selected as it is similar to the study I wanted to conduct. Using the above mentioned values in the below mentioned formula

$$\frac{2\,(Z_{\alpha/2} + Z_{\beta})^2\, P\,(1\text{-}P)}{(p_1 - p_2)^2}$$

Where,

$Z_{\alpha/2=} Z_{0.05/2}=Z_{0.025}$ = 1.96 at type 1 error of 5%

$Z_{\beta}=Z_{0.20}$= 0.842= at 80% power

$p_1 - p_2$= Difference in proportion in the two different groups = 21.8 - 9.81 = 11.99% P= Pooled prevalence = [Proportion in C section in Primigravida (p_1) + Proportion in C Section in Multigravida Group (p_2)]/2 = [21.8 + 9.81]/2 = 15.805

$$N = \frac{2 \times 15.8 \times 84.2\,(1.96 + 0.84)^2}{11.99 \times 11.99} = 20860.04/143.76 = 145.1$$ in each group

Considering Non response rate of 10%, 145.1 + 14.5 = 159.6 ≈ 160 patients will be included in each group.

RESULTS AND OBSERVATION

This present study was done to analyze the incidence, indications and complications of primary caesarean section in primigravida and multigravida. This study comprised of two groups – group A- primigravida and group B- multigravida, 160 patients in each group and subsequently observed for their mode of deliveries. From this study it was observed that the overall incidence rate of primary caesarean section rate was 58.75% (n=160) in group A and 31.87 % (n=160) in group B. The patients undergoing CS were taken as cases in this study and further analyzed accordingly as given below.

1. Percentage distribution of PCS group

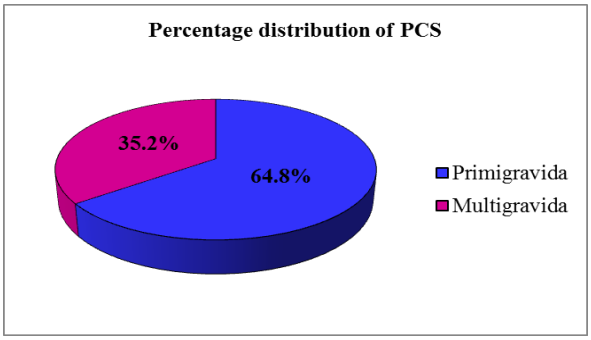

Fig- 1: Percentage distribution of PCS group

This study showed that of all patients undergoing primary caesarean section 64.8% (n=94) belonged to group A and 35.2 %(n=51) belonged to group B. Using fisher's exact test we got p=0.001 which is statistically significant.

2. Gravida distribution of PCS group

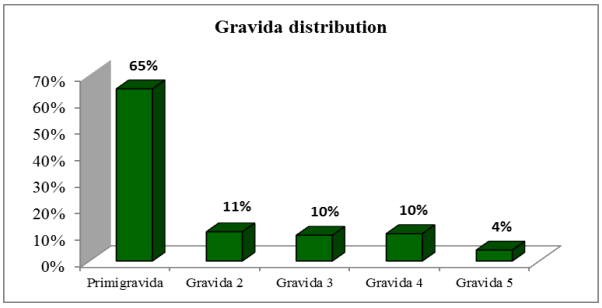

Fig-2: Gravida distribution graph in PCS group

This study that primigravida had a higher caesarean rate 64.80% which is statistically significant p= 0.001.

3. Age distribution in PCS

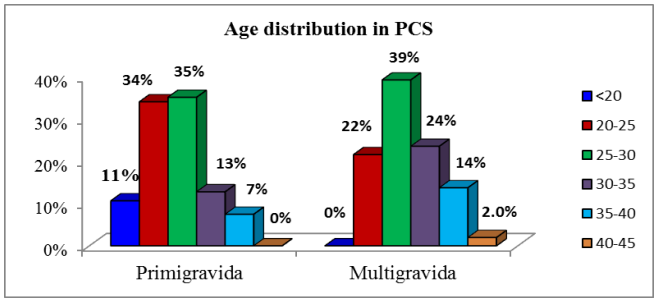

Fig-3: Age distribution in PCS group

This present study showed , majority of the patient who had undergone PCS were in the age group of 25-30 years for both groups showing p =0.001 which is statistically significant.

4. Percentage distribution in education

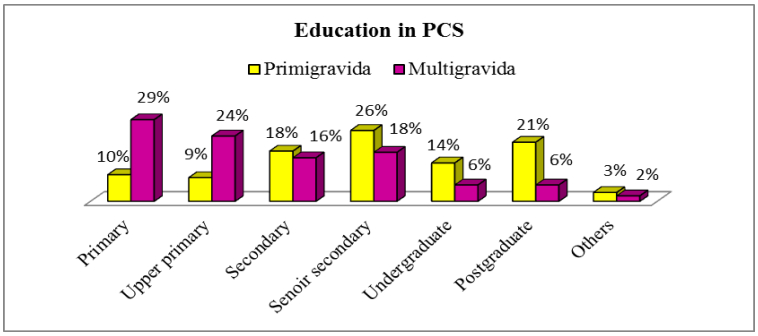

Fig-4: Percentage distribution in education

This study shows that majority of patients in group A have completed their senior secondary education (25.5%) (n=94) as compared to group B where majority has only completed their primary education (29.4%) (n=51) showing p value=0.001 which is statistically significant. Also this study showed that illiterate comprised of 3.2% in group A as compared to 2.0% of group B.

5. Occupation in PCS group

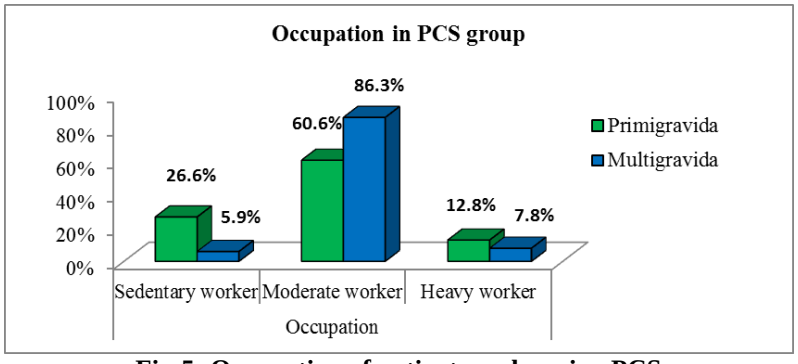

Fig-5: Occupation of patients undergoing PCS

This study shows that majority of the patients who has undergone Caesarean Section were moderate workers in both the groups, 60.6% (n=94) in group A and 86.3 % (n=51) in group B. Using chi-square test, p value = 0.003 which is statistically significant.

6. Number of ANC check-up in PCS group

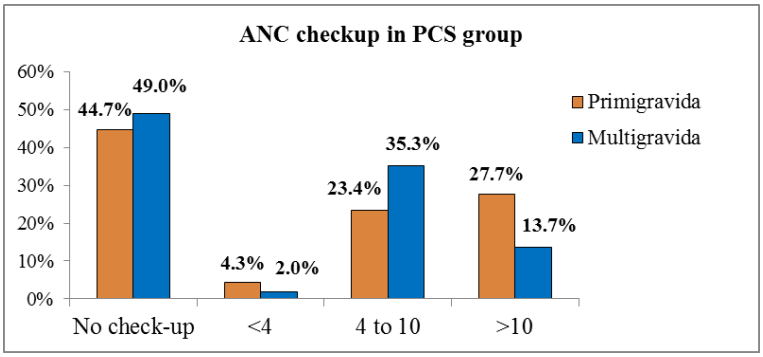

Fig-6: Number of ANC check-up in PCS group

This study shows that majority of the patients who had undergone primary caesarean section had no Antenatal check-up comprising 44.7% (n=94) in Group A and 49.0% (n=51) in group B. Using chi square test p value= 0.198 which is not significant.

7. Period of gestation in PCS group

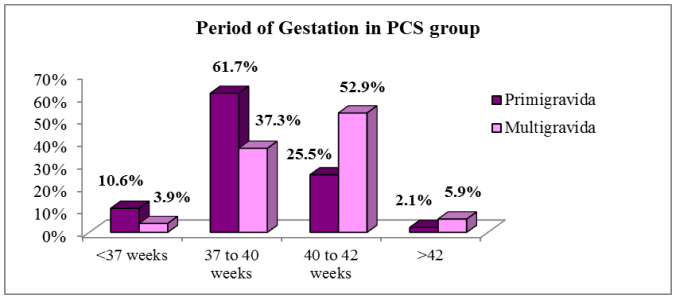

Fig-7: Period of gestation in PCS group

This study shows that majority of the patient who had undergone primary caesarean section in Group A (61.7 %) (n=94) has period of gestation between 37weeks to 40 weeks compared to group B (52.9%) (n=51) where majority of patients who had undergone primary caesarean section had period of gestation between (40 to 42) weeks. Using Fisher's Exact test, p value= 0.002 which is statistically significant.

8. Percentage of haemoglobin in PCS group

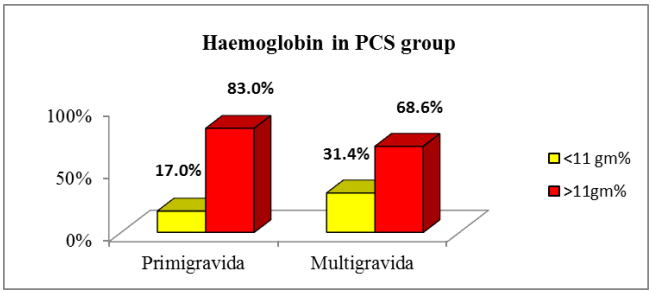

Fig-8: Percentage of haemoglobin in PCS group.

This study shows that majority of patients in both the groups has haemoglobin more than 11 gm. % compromising 83.0% (n= 94) in Group A and 68.6% (n=51) in Group B. Using Chi square test, p value= 0.08 which is not statistically significant.

9. Percentage of Emergency / Elective PCS

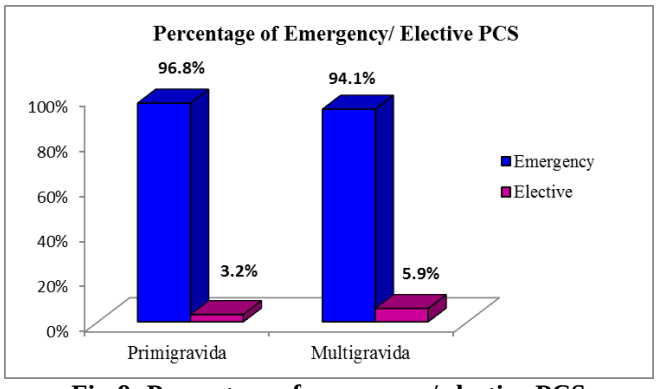

Fig-9: Percentage of emergency/ elective PCS

Table-1: Percentage of emergency/ elective PCS

Group	Primigravida		Multigravida		p value
	Number of patient	%	Number of patient	%	
Emergency	91	96.8%	48	94.1%	<0.0001
Elective	3	3.2%	3	5.9%	<0.0001

This study shows that both groups had majority of primary caesarean section as an emergency caesarean section i.e 96.8% (n=94) in Group A and 94.1% (n=51) in group B which is statistically significant.

10. Indications of Emergency PCS

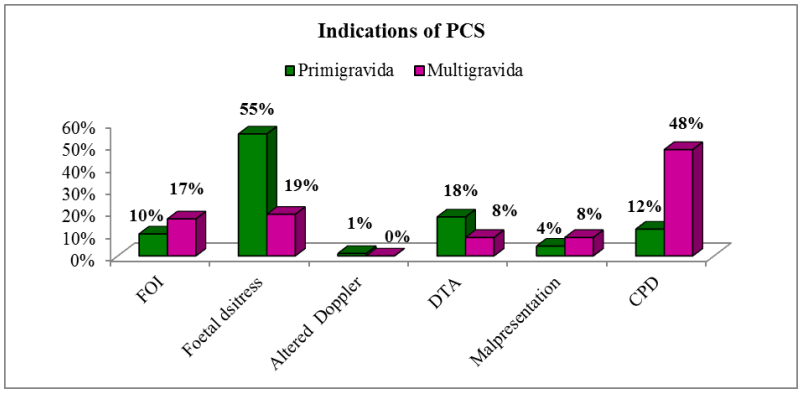

Fig-10: Indications of Emergency PCS

Table-2: Indications of Emergency PCS

Indication of Emergency caesarean section	Primigravida		Multigravida		p value
	Number of patients	%	Number of patients	%	
FOI	9	9.89	8	16.67	0.861
Foetal distress	50	54.95	9	18.75	**0.045**
Altered Doppler	1	1.10	0	0.00	ns
DTA	16	17.58	4	8.33	0.587
Malpresentation	4	4.40	4	8.33	0.861
CPD	11	12.09	23	47.92	**0.0421**
Total	91		48		

This study shows that maximum of the patients who were posted for emergency CS in group A was for foetal distress (54.95%) and in group B was for CPD (47.92%) which is statistically significant.

11. Indications of Elective PCS

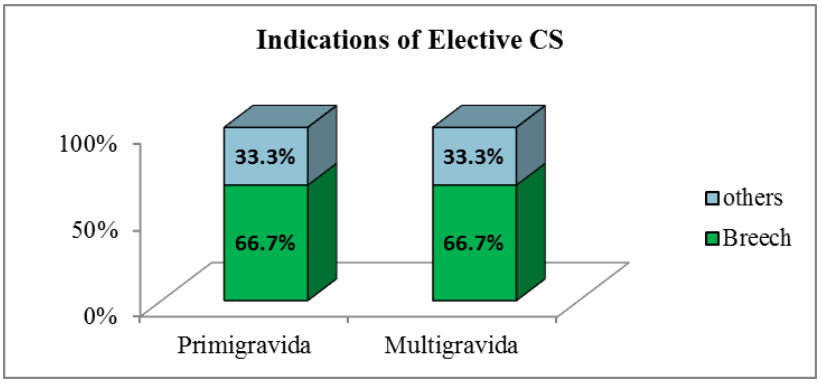

Fig-11: Indications of elective PCS

Our study found that the indications for elective caesarean section were the same in both the groups. Using Chi square, p value = 0.98 which is not statistically significant. The others include caesarean section on maternal request.

12. Intra-op complications of CS group

Table-3: Intra-op complications of PCS group

Intra-op complication	Primigravida		Multigravida		p Value
	Number of Patients	%	Number of Patients	%	
Uterine wound extension	16	80%	5	22.7%	**0.0179**
PPH	4	20%	17	77.3%	**0.029**
Total	20	100.0%	22	100.0%	

This study shows that uterine wound extension were more common in group A (80 %) with p value =0.017 which is statistically significant whereas PPH was more in group B (77.3%) with p value = 0.029 which is also statistically. No bladder injury was noted in either group during the study period.

13. Post-op complications in CS group

Table-4: Overall post-op complications in PCS group

Gravida status	Post-op complications			p Value
	Yes	No	%	
Primigravida	13	81	13.82%	**0.00189**
Multigravida	33	18	25.49%	

Table-5: Post-op complications in CS group

Post- op complication	Primigravida		Multigravida		p Value
	Number of Patients	%	Number of Patients	%	
Puerperial pyrexia	5	38.46	10	30%	0.742
Wound infection	1	7.69	5	15%	0.846
UTI	5	38.46	11	33%	0.831
Blood transfusion	2	15.38	7	21%	0.86
Total	13	100.00	33	100%	

This study showed that post-op complications were more in group B (25.49%) compared to group A (13.82 %) which is statistically significant.

14. APGAR score at 1 minute of babies in PCS group

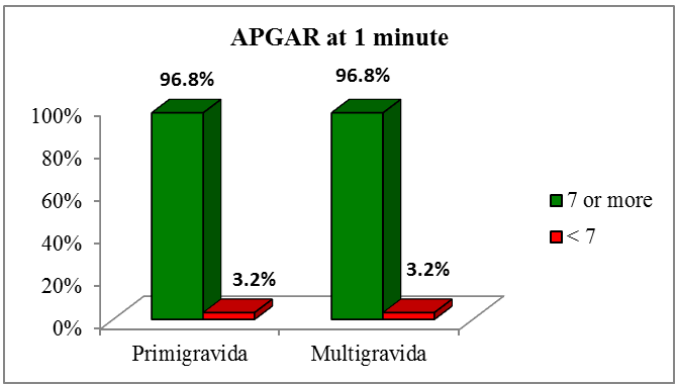

Fig-12: APGAR score at 1 minute of babies in PCS group

This study shows that the APGAR score of babies at 1 minute in both the groups were similar. i.e 96.8 % babies had APGAR score more than 7 at 1 minute for both group A and group B with p value = 0.931 which is statistically not significant.

15. APGAR score at 5 minutes of babies of PCS group

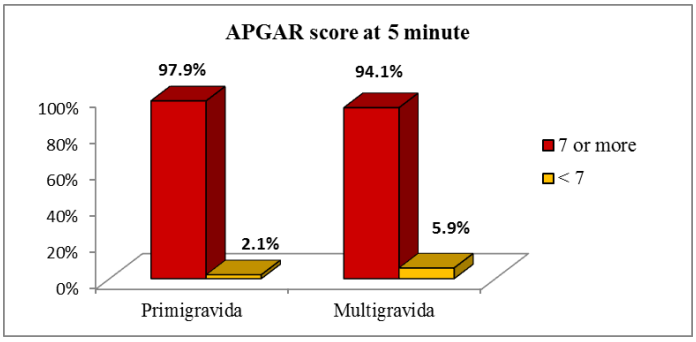

Fig-13: APGAR score at 5 minutes of babies of PCS group

This study showed that APGAR score more than 7 after 5 minutes in babies of group A was 97.9% and in group B was 94.1 % with p value = 0.902 , which is not statistically significant.

16. Birth weight distribution of babies in PCS group

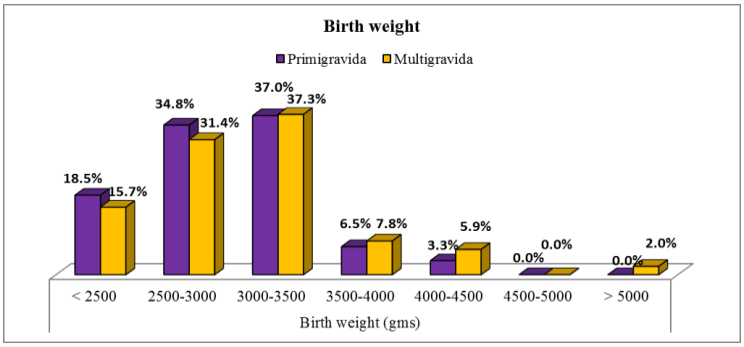

Fig-14: Birth weight distribution of babies in PCS group

This study shows that the birth weight of babies born to both the groups were almost similar with p value =0.976 which is not statistically significant.

17. NICU admission of babies of PCS group

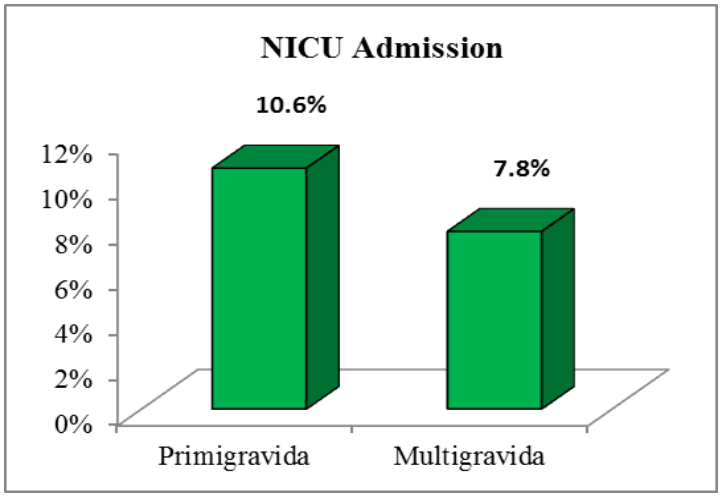

Fig-16: NICU admission of babies of CS group

This study shows that 10.6 % of the babies of group A were admitted in NICU compared to 7.8% of the babies in group B showing p value = 0.889 which is not statistically significant.

18. Duration of NICU stay of the babies admitted

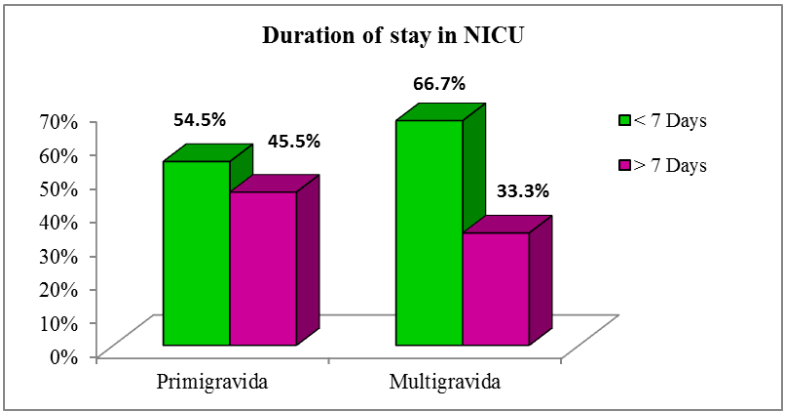

Fig-17: Duration of NICU stay of the babies admitted

This study shows that majority of the admitted in NICU were discharged within 7 days in both the groups with p= 0.661 which is not statistically significant.

19. Early neonatal death of babies in NICU of PCS group

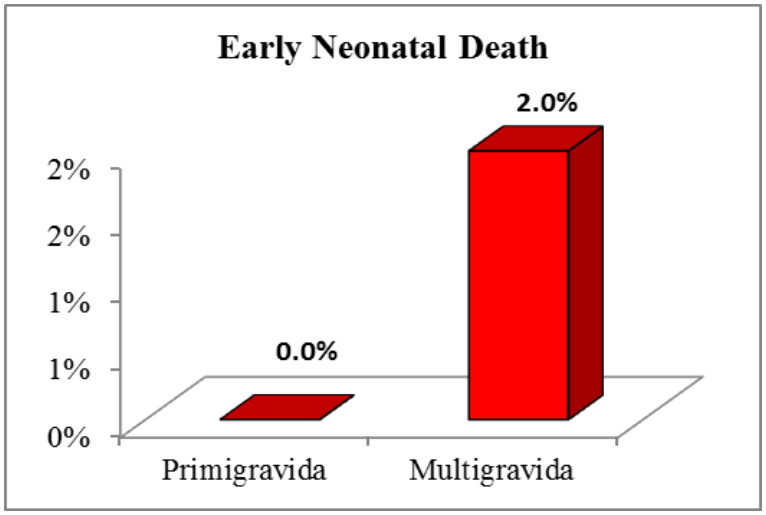

Fig-17: Early neonatal death of babies in NICU of PCS group

In this study there was only 1 early neonatal death which belonged to group B (2%), which is not statistically significant.

DISCUSSION

With the rising trend of caesarean section both primary and repeat in modern obstetrics there is a major concern in the health care system throughout the world in both developed and developing countries .

The study conducted by Ana Pilar Betran et.al [10], showed the rising trends of caesarean section worldwide depending on the coverage from 6.7% to 19.1% from the year 1990 to 2014 . The study conducted by Mittal Shiba et.al [28] showed an increasing caesarean rate from 17.15% in 2001, 23.47% in 2006 and 28.93% in 2011. Also in the study conducted by Alaka Banerjee et.al [16], caesarean rate showed an increasing trend- 27.5% in 2010, 35.08% in 2015 and 39.6% in 2017 as shown in table 6 below . The reasons for the increased rate are multifaceted like better electronic intrapartum monitoring equipments to detect fetal distress, improvement in NICU facilities, availability of blood and blood products, better surgical skills, safer anaesthetic drugs and advanced anaesthesia techniques. In order to decrease the caesarean rate, indications for primary caesarean section must be well analyzed and studied.

Table-6: Increasing trends of caesarean rate over the years by different studies

Study	Place of study	CS Trends observed (%)
Alaka Banarjee *et al* [16]	Assam , India	2010=27.5 % 2015=35.08% 2017=39.6%
Mittal Shiba *et al* [28]	Seth G S Medical college and K.E.M hospital, Mumbai, India	2001=17.15% 2006=23.47% 2011=28.93%
Ana Pilar Betran *et al* [10]	Worldwide increase from 1990 to 2014 World total (90% coverage) i.e Least developed region (74.5% coverage) Less developed regions (93% coverage) More developed regions (98.9% coverage) Africa (81.8%) coverage Asia (93.1%) coverage Europe (98.1% coverage) Latin America and the Caribbean (84.3%) coverage Northern America 100% coverage Oceania (56.6% coverage)	6.7% to19.1% 1.9% to 6.1% 6.3% to 20.9% 14.5% to 27.2% 2.9% to7.4% 4.4% to19.5% 11.2% to 25.0% 22.8% to 42.2% 22.3% to 32.3% 18.5% to 32.6%

In present study , the caesarean rate was shown to be higher in group A i.e 58.75% which is similar to M. Sujatha Alagesan et.al]19] being 57.87% due to good intrapartum fetal monitoring which detects fetal distress leading to a good early neonatal outcome. However the incidence for group A is much higher compared to Dr. Shrutee Birla *et al* [9] (21.80%), as given in the table 7 below . The incidence for group B i.e 31.87% is much higher compared to other studies like M. Sujatha Alagesan et.al being only 9.31% [4] and Dr. Shrutee Birla et.al (9.81%) [9] due to higher referrals of un-booked patients from peripheral areas in view of complicated pregnancies and obstructed labour with history of patients having tried home deliveries . In studies like Meeta Gupta *et al* [20] the overall incidence of PCS is also high being 63.48% but not given separately for primigravida and multigravida who has undergone PCS.

Table-7: Incidence of PCS in primigravida and multigravida in different studies

Study	Location	Duration	Subjects	Incidence of PCS in primi	Incidence of PCS in multi
Present study	Nazareth Hospital, Shillong, Meghalaya, India	9 months 23-07-18 to 23-03-19	Total primigravida =160, out of which 94 had undergone PCS. Total multigravida =160, out of which 51 had undergone PCS	58.75%	31.87%
M.Sujatha Alagesan *et al* [19]	Tirunelveli Medical College Hospital, Tamil Nadu, India.	6 months 01-01-16 to 31-06-16	Total Primigravida=2018, out of which 1168 had undergone PCS Total Multigravida=1565, out of which Repeat CS=610. PCS=89	57.87%	9.31%
Dr. Shrutee Birla et.al [9]	Umaid Hospital, attached to Dr.S.N.Medical College, Jodhpur	3 months, 01-03-13 To 31-05-13	Total Primigravida=2179, out of which 475 had undergone PCS. Total Multigravida=2802, out of which 275 had undergone PCS	21.80%	9.81%

In present study the patients who has undergone primary caesarean are taken as cases and the percentage of PCS has been calculated comprising of 64.8% in primigravida which is lesser compared to Meeta Gupta *et al* [20] (72.75%), M. Sujatha Alagesan *et al* [4] (92.91%) , Jain M *et al* [6] (72.40%) as given in the table below as all the studies are done in medical colleges where complicated and high risk pregnancies are referred from peripheral primary health care centers . In present study , the percentage of multigravidas

undergoing PCS is 35.2% which is higher compared to other studies like Meeta Gupta et.al [20] (27.24%), M.Sujatha Alagesan et.al [19] (7.08%) and Jain M et.al [6] (27.59%) as majority of the multigravidas who had undergone PCS in this present are referred from primary health care centers in view of obstructed labour or prolonged labour with history of trying home deliveries which is still a common practice in this part of the country . The different percentage difference in shown in table 8 below:

Table-8: Percentage distribution of PCS in primigravida and multigravida

Study	Location	Duration	Subjects	Percentage of primi in PCS	Percentage of multi in PCS
Present study	Shillong	9 months	Total PCS=145, out of which PCS in primi =94, PCS in multi =51	64.8%	35.2%
Meeta Gupta *et al* (20)	Jaipur	1 year	Total CS=931, out of which PCS=591(63.48%) PCS in primi =430 PCS in multi =161 Repeat CS=340(36.52%)	72.75%	27.24%
M.Sujatha Alagesan *et al* (19)	Tamil Nadu	6 months 01-01-16 to 31-06-16	Total PCS=1257, PCS in primi =1168 PCS in multi= 89	92.91%	7.08%
Jain M *et al* (6)	Rajasthan	1 year 01-04-14 to 31-03-15	Total deliveries =7295 Total CS=1349 PCS=685(55.8%) PCS in primi =496 PCS in multii=189 Repeat CS=664(49.2%)	72.40%	27.59%

This study showed that majority of the patient undergoing Caesarean section in group A belonged to age group of 20-25 years (34.0%) which is lesser compared to M.Sujatha Alagesan et.al [19] (47.95%). But number of caesarean in the age group of 26-30 years (35.1%) is comparable to M.Sujatha Alagesan et.al [19] (33.7%). For group B, majority PCS belonged to age group 22-30 years (39.2%), this is similar to incidence of caesarean section in group 25-29 years (41.6%) of M. Sujatha Alagesan [19]. This disparity is seen due to high prevalence of multiparity and early marriage in this region. The findings of this present study is similar to Jain M et.al [6] where overall caesarean section rate was 54.3% for age group 20-25 years and 21.4% for age group 26-30 years. In a study done by Meeta Gupta et.al [20] also showed similar overall incidence caesarean section was 68.53% for age group 20-25 years and 21.58% for age group 26-30 years. The age distribution of PCS group in different studies as shown in table 9 below.

Table-9: Age distribution of PCS group in different studies

Study	Age	Percentage
Present study	20-25 years 26-30 years	Primi = 34.0% Multi = 21.6% Primi = 35.1% Multi = 39.2%
M.Sujatha Alagesan *et al* [19]	20-24 years 25-29 years	Primi = 47.95% Multi=36.0% Primi =33.7% Multi = 41.6%
Meeta Gupta *et al* [20]	20-25 years 26-30 years	68.53% 21.58%
Jain M *et al* [6]	21-25 years 26-30 years	54.3% 21.4%

Regarding the educational status , this study showed that majority patients in group A (25.5%) have completed their senior secondary education compared to group B (29.4%) where majority have completed their primary education showing a higher literacy rate in group A. Also in present study 3.2 % of the patients in group A were illiterate compared to 2.0% in group B. This findings can be explained as majority of the low socioeconomic status patient with low qualification come to this hospital for delivery as it is a charitable

hospital compared to the other private sector hospitals where the health care cost is more and the patient base is educated with higher socio-economic class. There is no study to compare this variable separately for both the groups. However in Ujjval Parikh et.al[30], 25% patients who underwent caesarean section were illiterate and majority of the patients have completed high school (31.47%).

Present study showed that majority of the patients (60.6% in group A and 86.3% in group B) undergoing caesarean section were moderate workers which is similar to study done by Neelam Rajput et.al [24] which was 77.20%. Although their study comprised only of Multigravida. Higher incidence of working Multigravida in our studies can be explained as females in this part of the country are habituated to work and to be independent to support the family along with the husband.

In present study the number of antenatal checkup of patients in both groups were very poor. In group A 44.7% and in group B 49.0% had no antenatal checkups due to false belief in traditional home delivery system, scarcity of health care delivery system in rural areas and financial constraints.

Present study showed that majority of the patients who had undergone PCS were in the gestational period of between 37 to 40 weeks of gestation in group A (61.7%) compared to group B (37.3%). In group B majority patients (52.9%) belonged to postdated group (40 to 42 weeks of gestation) as multigravidas tends to cross their due dates. This can be explained on basis of increased fetal weight with subsequent pregnancies leading to cephalopelvic disproportion. However in studies like Neelam Rajput et.al[24] majority of the multigravidas who had undergone PCS were in the gestational period between 37-40 weeks (59.33%).

Regarding the anaemia status of the patients in this study, most of them had Hb > 11 gm due to non-vegetarian diet of this part of the region although there were few patients (31.4%) who had Hb <11 especially in group B due to multiparity and poor antenatal check-up with no consumption of iron tablets. Very few patients had blood transfusion during antenatal period.

This study showed that primary caesarean rate was more due to emergency caesarean in both groups (96.8% in group A and 94.1% in in group B). Very few patients from both groups underwent elective PCS-3.2% in group A and 5.9% in group B. Incidence of elective and emergency PCS in both groups are almost similar. Incidence of elective PCS in our study is much lower than that found by Alaka Banerjee et.al [16], Jain M et.al [6]. This is explained by the fact that our institute is a tertiary level institute which receives high number of complicated pregnancies like foetal distress, prolonged and obstructed labour, cord and limb prolapsed, ruptured uterus etc.

Table-10: Percentage distribution of emergency PCS / elective PCS in primigravida and multigravida

Study	Emergency PCS %	Elective PCS %
Present study	Primi = 96.8% Multi = 94.1%	Primi = 3.2% Multi = 5.9%
Alaka Banerjee et.al (16)	75.6%	24.4%
Meeta Gupta et.al (20)	62.08%	37.92%
Jain M et.al (6)	79.3%	20.7%

Present study the leading indication for emergency caesarean section in group A was fetal distress which is higher compared to study done by Dr. Shrutee Birla *et al* [5] where meconium stained liquor was a common indication for PCS. In group B, majority of the emergency caesarean section were done due to cephalopelvic disproportion and deep transverse arrest due to increase in fetal size and weight with subsequent pregnancies which is also higher compared to Dr. Shrutee Birla et.al [9]. Also majority of the patients in groups B who were taken up for emergency caesarean section had a history of trying home delivery where bearing down efforts of the parturient already started in latent phase of labour .

Table-11: Percentage distribution of indications of emergency PCS in primigravida and multigravida

Study	Fetal distress (%)	Cephalopelvic disproportion (%)	Malpresentaion (%)	Failure of induction (%)
Present study	Primi = 54.95% Multi = 18.75%	Primi = 12.09% Multi = 47.92%	Primi = 4.40% Multi = 8.33%	Primi = 9.89% Multi = 16.67%
Dr. Shrutee Birla *et al* [9]	Primi = 32.21% Multi =17.45%	Primi = 13.4 % Multi = 13.82%	Primi = 2.94% Multi = 8.72%	Primi = 6.10% Multi = 3.64%
Jain M *et al* [6]	8.2%	0.9%	34.3%	12.7%
Meeta Gupta *et al* [20]	11.82%	12.03%	0.53%	3.54%

In this study the incidence of elective caesarean section was breech presentation with term pregnancy. This was similar in both the groups comprising 3.3%.s hospital doesn't give trial for vaginal delivery for breech unless patients comes in second stage with breech climbing the perineum .The other indications for elective caesarean section were caesarean section on maternal request . Caesarean on maternal request constituted 2.5% (36) of all births in the United States.

In this study , intra-operative complications overall were more common in group B out of which postpartum hemorrhage was the commonest which was higher compared to studies like Dr . Shrutee Birla et. al. (9), although the percentage was calculated out of the total intra-operative and postoperative complications. This is explainable due prolong labour of having tried home delivery and anemia which was contributory to their poor antenatal check-up and casual attitude of hospital delivery. However uterine wound extension was slightly higher in group A as maximum of the primigravida were taken up as emergency caesarean section due to fetal distress.

Table-12: Intra-operative complications of PCS in primigravida and multigravida

Study	Atonic postpartum haemorrhage	Uterine wound extension
Present study	Primi = 20% Multi = 77.3%	Primi = 80% Multi = 22.7%
Dr Shrutee Birla *et al* [9]	Primi = 5.89% Multi = 8.73%	Primi=2.11 % Multi = 2.18%
Shweta Yadav *et al* [5]	8.6%	3.2%

In this study, the overall post-operative complications were more in group B due to anemia, trial home delivery and using unsterile methods for trying home delivery, PROM of more than 24 hours.

The other non-significant results of the patients who had undergone PCS in this present study includes the booking status , marital status, religion, use of contraception, BMI and ANC pre-existing or antenatal complication. In this study, the booking status of patients in either group was almost similar with more number of unbooked patients in group B which is similar to G Sharmila *et al*., [37] about 68.8%, Shubhangi Mande et.al (25)but higher compared to Meeta Gupta et.al [20] due to the casual attitude and belief that once they have delivered a live healthy baby they don't need to visit a hospital for checkup and will plan for a home delivery as in this part of the region home delivery is still a common practice.

Regarding the religion status, majority of the patients who had undergone PCS belonged to Christianity as Christianity is the major religion in the state of Meghalaya. This study also showed that majority patients had a normal BMI in both groups due to healthy dietary habits of the region.

Present study showed that regarding the associated medical complication during antenatal period, hypothyroid was common in both the groups due to geographical location of the place of study which is a hilly area. This is also stated in by Ujjval Parikh et.al [30] , where they stated that the most common associated medical complication was hypertensive disorder of pregnancy, followed by diabetes and thyroid disorders (70%).

Regarding contraception practice, both groups had very few patients who practiced methods of contraception for family spacing which is not significant as this part of the region, females believe in big family size. We did not find any similar study to compare this finding.

This study also showed that marital status of the patients in both groups is not statistically significant as this part of the region usually practice co-habitation. There is no study to compare the findings

The overall early neonatal outcome in this study was good and not statistically significant as the APGAR score at 1 minute and 5 minutes of babies delivered to both the groups were similar and majority had APGAR score > 7 due to well-trained Pediatricians and staff at this hospital with good resuscitative skills, although few babies had to be admitted in NICU for few days. The babies admitted in NICU were admitted mainly for prematurity for observation which were mostly discharged < 7 days of stay. During the period of study we had one early neonatal death in group B due to congenital anomalies. In studies like Jain M et.al neonatal morbidity due to jaundice is highest 40.6%,followed by prematurity 23.6% and the majority of neonatal death was mainly due to prematurity (67.9%) followed by meconium aspiration syndrome (25%).

This study showed that majority of the birth weight of babies delivered to both groups had birth weight of around 3000 grams to 3500 grams which is the mean weight due to good non vegetarian diet of this region although constitutionally the population is small built . In the study conducted by Dr. Y. Anupama Suresh et.al [18], majority of the baby weights delivered by PCS were between 2500-3000 grams, 46%

in primigravida and 28% in multigravida followed by 3000-3500 grams, 30% in primigravidas and 24% in multigravidas.

CONCLUSION

As we have witnessed an increased rise in the rate of caesarean section over the past few years it is our responsibility to bring out the change and modifications and note that the indications for caesarean section should be genuine. From this study, we can also see many women having no antenatal check-up have more chances of caesarean section due to undiagnosed obstetric or medical complication. This can be changed by creating awareness about antenatal check-up. Doctors and nursing staff in remote referral centers should be trained for timely referral of patients to avoid unnecessary complications. There is a need to improve skills of obstetricians and staff to read CTG, perform ECV, perform instrumental deliveries especially in second stage of labour. Proper counseling of patients and availability of labour analgesia are also important to decrease caesarean rates. The overall reduction in caesarean rate can only be reduced if the indications of primary caesarean sections can be analyzed stringently and reduced.

Limitations of the study

Being a tertiary hospital most of the patients taken up for emergency caesarean section were referred from peripheral referral centers in view complicated pregnancies, thereby contributing to a high rate of caesarean section in this hospital. Hence the result of this study may not truly reflect the actual condition regarding the incidence of primary caesarean section rate in the region.

Recommendations for reduction in caesarean section rate

Based on results of our study we recommend following points to decrease rate of primary caesarean section, rates of complications during caesarean section-

- Proper care and counseling from antenatal period
- Proper care and monitoring during intrapartum period
- Early referral to higher facilities when difficulties are anticipated
- Proper use of labour analgesia in patients who want caesarean section on request.
- Improving obstetrician's skills in ECV in breech presentation, breech delivery and instrumental deliveries.
- Increasing use of instrumental deliveries for fetal distress in second stage of labour
- Using fetal scalp pH to determine foetal distress whenever possible

Ethical Approval

The study was approved by the Institutional Ethics Committee.

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