

## INDICATIONS FOR PRIMARY CAESAREAN SECTION IN MULTIGRAVID WOMEN AND THEIR MATERNAL OUTCOMES: A PROSPECTIVE OBSERVATIONAL STUDY

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### ABSTRACT

**Background:** Caesarean section is an essential lifesaving surgical procedure but cesarean sections must be opted wisely. Sometimes the history of previous vaginal delivery tends to be considered as a factor that implies the probability for further deliveries also to be vaginal, but this cannot be granted without proper antenatal checkups and timely monitoring of the pregnant woman. Relaxation on antenatal checkups can lead to a need for emergency caesarean sections if medical indications are unattended. This study aims to identify the various indications of caesarean section in multigravida who had one or more vaginal deliveries previously and who are attending tertiary care centers for their antenatal care and the maternal outcome of the same. **Materials and Methods:** A prospective observational study was carried out to identify the various indications of primary caesarean section in multigravid women and the maternal outcomes in them. 252 multigravid women attending the Government Medical College over a period of one year were included in the study after considering inclusion and exclusion criteria. Age, gender, education, past obstetric history, type of ANC, comorbidities, type of caesarean sections, indications and outcomes for caesarean sections were studied and described for the study sample. The data was entered into Microsoft Excel. The qualitative variables were expressed as percentages and quantitative variables were expressed as mean and standard deviation. **Results and Discussion:** The participants' ages ranged from 21 to 45 years, mean age of 30.10 years with a standard deviation of 4.93 years and majority of them were gravida two. All the subjects were booked cases. The indications for emergency caesarean sections in the study population were fetal distress (38.7%), malpresentation (17.4%), failed induction (7.0%), meconium stained amniotic fluid with unfavourable cervix (7.0%), antepartum haemorrhage (5.2%), fetal growth restriction with absent end-diastolic flow (5.2%), dysfunctional labor (3.5%), placenta previa (3.5%), medical disorders (3.5%) and failed trial for cephalopelvic disproportion (1.7%). The indications for elective caesarean section in the study population were primarily placenta previa (72.7%), followed by malpresentation (9.1%) and fetal distress (4.5%). Among those who underwent caesarean section complications or maternal outcomes noticed included pyrexia, surgical site infections, and development of sepsis. Overall, 67% of participants who had emergency and elective caesarean section reported no postoperative complications. Various studies across India as well as across the world also depicted similar findings. **Conclusion:** From our study we identified that fetal distress and malpresentations as common indications for both in elective as well emergency primary caesarean sections in multigravida though most common indication for elective caesarean section in the study population was primarily placenta previa and fetal distress in emergency caesarean section. In the study population, most common maternal complication was pyrexia, followed by surgical site infections among those who underwent emergency as well elective caesarean sections. In those who underwent elective caesarean sections complications were comparatively less. Among the study population, 33% of study population who underwent emergency caesarean section and 27.3% of those who had elective caesarean section reported postoperative complications.



## INTRODUCTION

Caesarean section is an essential lifesaving surgical procedure that gained its relevance as it got identified as a satisfactory alternative to a vaginal birth in situations where vaginal delivery poses risks and when maternal and fetal outcomes are compromised. But cesarean sections must be opted wisely. It should be carried out only when they are required in medically indicated situations. As per the report by World Health Organization's Department of Reproductive Health and Research evidence has shown that "caesarean section rates higher than 10% are not associated with reductions in maternal mortality and neonatal mortality". Caesarean sections can lead to complications, disability or death, especially in settings that lack appropriate facilities to conduct safe surgery and manage complications. Caesarean sections should be undertaken only when medically indicated. Unnecessary surgical procedures can be harmful both for the woman and her baby because surgery always involves some amount of risks especially about anesthesia, bleeding, infections, and delay in recovery. At the same time, appropriate decision should be taken to provide caesarean sections to women in need whenever medically indicated.<sup>[1]</sup>

The optimal rate for caesarean sections for a country as proposed by World Health Organization (WHO) ranges between 10 and 15%. Over the years caesarean sections have become increasingly common in both developed and developing countries. This has raised concern worldwide because higher caesarian rates especially above the optimal proposed by WHO are not beneficial. No significant change in neonatal and maternal mortality is observed when the caesarean section rate exceeds 15%-19%. When medically indicated a caesarean section can effectively prevent maternal and newborn mortality. Studies have shown that when caesarean section rates rise towards 10% across a population, the number of maternal and newborn deaths decreases but when the rate goes above 15-19%, there is no evidence that mortality rates improve.<sup>[2]</sup> The rates in India have surpassed the WHO threshold of 15%, posing a serious public health risk.

According to National Family Health Survey 5 (NFHS-5) for 2019-2021 the proportion of births delivered by caesarean section in India was 21.5% whereas data from National Family Health Survey 4 (NFHS 4) for the period 2015-2016 showed that caesarean section rates were only 17.2 %.<sup>[3]</sup> In India, 47.4% of babies born in the private sector are born by caesarean section, which is far above the rates in government facilities (14.3%). About 2 in 5 babies in Kerala were delivered by cesarean section. The caesarean section rate in Kerala is 40% (NFHS-5).<sup>[4]</sup> All these data relating to caesarean rates reflects the increasing trend towards caesarean sections in India. Whereas low caesarean section rates in underdeveloped communities can be a concern,

medically unnecessary overuse of caesarean sections raises a different set of issues that demands targeted health policy interventions to achieve more appropriate use of caesarean sections.<sup>[5]</sup>

Caesarean sections are either elective caesarean sections or emergency caesarean sections. Elective caesarean sections are performed for an antepartum indication. Emergency caesarean sections are performed after labor onset, mostly due to failure to progress or suspected fetal compromise usually performed when there is an immediate threat to the woman or fetus. The most common indications for which caesarean sections are carried out in primipara include malpresentation, oligohydramnios, eclampsia, and preeclampsia. Studies have shown that malpresentation is the commonest indication for cesarean sections in both primi and multipara. Intraoperative complications like an extension of uterine incision and postpartum hemorrhage (PPH) were found more in emergency caesarean section than an elective caesarean section and more in multiparous women.<sup>[6]</sup>

Primary caesarean section in multigravid women who have delivered vaginally once or more means the first caesarean section done in those who had delivered vaginally once or more than once. Mainly the placental factors and factors related to the fetus are responsible for caesarean section in multigravid or multiparous who had previous one or more vaginal deliveries. Multiparous women who have previously delivered vaginally can develop Cephalo Pelvic Disproportion (CPD) even if they had previously delivered a full-term child vaginally. Since the fetus increases in size with multiparity, the size of fetus and fetal head should be carefully estimated and delivery or caesarean section must be planned accordingly. In multiparous women, malpresentation can also occur which in turn can indicate the need for caesarean section.<sup>[7]</sup> It is often held that if a woman delivers normally once, all the subsequent births will be normal, leading to multiparous women ignoring standard antenatal check-ups. But in situations like malpresentation and Cephalo Pelvic Disproportions (CPD), emergency caesarean sections may be indicated even in a woman who had a previous vaginal delivery. It is also critical to investigate the other indications for caesarean section and its outcomes in women who have previously given birth vaginally. It has been observed in low and middle-income countries, women undergoing emergency caesarean section were twice likely to die than those delivered by elective caesarean section.<sup>[8]</sup>

Complications can occur in women even if the woman had a previous normal vaginal delivery previously. Pathological Cardiotocography (CTG) and malpresentation are the most common indications for primary caesarean section in multigravida. Though vaginal delivery is always safer than caesarean section, difficult vaginal delivery and obstructed labor has more risk of maternal morbidity and perinatal mortality when compared to an elective caesarean section. Therefore

early recognition and timely intervention for medical indications will decrease fetal loss and improve pregnancy outcome.<sup>[9]</sup> Sometimes the history of previous vaginal delivery tends to be considered as a factor that implies the probability for further deliveries also to be vaginal, but this cannot be granted without proper antenatal checkups and timely monitoring of the woman.

Relaxation on antenatal checkups or tracking about the above scenario can lead to a need for emergency caesarean sections if medical indications are unattended. This study aims to identify the various indications of caesarean section in multigravida who had one or more vaginal deliveries previously and who are attending tertiary care centers for their antenatal care and maternal outcome related to it. The effects of caesarean sections on outcomes, like maternal and perinatal morbidity and pediatric outcomes are still unclear. While cesarean sections are lifesaving in medically indicated conditions, they can cause long-term and short-term health problems in a woman and her baby if it is not medically indicated and if their benefits do not outweigh the complications. More studies need to be conducted to understand the health effects of caesarean section on immediate and future outcomes in women and newborns across various populations in the world.

## MATERIALS AND METHODS

This prospective observational study was conducted over one year in the Department of Obstetrics and Gynecology, Government Medical College, Kottayam, and included 252 multigravid women with a previous vaginal delivery who subsequently underwent a primary elective or emergency caesarean section. Participants meeting the inclusion and exclusion criteria were enrolled by convenient sampling after obtaining informed written consent. Clinical, obstetric, intraoperative, and postoperative data were collected from patient records and entered into a structured proforma. Data were analyzed using Microsoft Excel, with categorical variables expressed as frequencies and percentages and continuous variables as mean  $\pm$  standard deviation. The study was approved by the Institutional Review Board and Human Ethics Committee, and confidentiality of participants was maintained throughout.

## RESULTS

This prospective observational study was carried out to study on the indicators and outcome of primary caesarean sections in multigravid women with previous vaginal deliveries who were admitted at Government Medical College Kottayam during the study period. The study enrolled a total of 252 participants during the specified study period.

The age of study participants ranged from 21 to 45 years, with mean age 30.10 years with a standard deviation of 4.93 years.

**Table 1: Distribution of study population based on age**

Age group(Years)	Frequency	Percentage
21-25	34	13.5
26-30	131	52.0
31-35	55	21.8
36-40	21	8.3
41-45	11	4.4
<b>Total</b>	<b>252</b>	<b>100.0</b>

The age distribution of the study population shows that the majority of study participants were in the 26-30 years age group, accounting for 52.0% of the participants. This was followed by 21.8% in the 31-35

years group, 13.5% in the 21-25 years group, 8.3% in the 36-40 years group, and 4.4% in the 41-45 years group.

**Table 2: Distribution of study population based on education level**

Education level	Frequency	Percentage
<10th Standard	60	23.8
10th - 12th Standard	73	29.0
Undergraduate	115	45.6
Postgraduate	4	1.6
<b>Total</b>	<b>252</b>	<b>100.0</b>

The distribution of study population based on their educational status reveals that 45.6% had undergraduate education, 29.0% completed 10th to

12th standard, 23.8% had less than 10th standard education, and a small portion, 1.6% held postgraduate degrees.

**Table 3: Distribution of study population based on gravida status**

Gravidity	Frequency	Percentage
Second gravid	168	66.7
Third gravid	72	28.6

Fourth gravid	12	4.8
Total	252	100.0

The distribution of study population based on gravida status indicates that 66.7% that is majority of the participants were second gravida, 28.6% were third gravida, and 4.8% were fourth gravida.

**Table 4: Distribution of study population based on Antenatal care point and referral status**

Type of ANC	Frequency	Percentage
On ANC at the institution itself	148	58.7
Referred	104	41.3
Total	252	100.0

All the study participants in our study were booked cases. The distribution of the study population based on the antenatal care point shows that 58.7% of the

participants were taking ANC from the Obstetrics and Gynecology department at the institution while 41.3% were referred cases.

**Table 5: Distribution of study population based on gestational age**

Gestational Age (weeks)	Frequency	Percentage
<34weeks	28	11.1
34 - 37 weeks	36	14.3
37 - 38 weeks	60	23.8
38 - 39 weeks	46	18.3
39 - 40 weeks	82	32.5
Total	252	100.0

The distribution of the study population based on gestational age reveals that 32.5% of the study participants delivered between 39 and 40 weeks,

23.8% between 37 and 38 weeks, 18.3% between 38 and 39 weeks, 14.3% between 34 and 37 weeks, and 11.1% delivered before 34 weeks.

**Table 6: Distribution of study population based on previous obstetric history**

Previous obstetric history	Frequency	Percentage
Normal	214	84.9
Abnormal	38	15.1
Total	252	100.0

The distribution of the study population based on previous obstetric history shows that 84.9% of the participants had a normal obstetric history, while 15.1% had an abnormal obstetric history.

**Table 7: Distribution of study population based on presence of risk factors**

Risk Factor	Frequency	Percentage
DM	78	31.0
HTN	26	10.3
PPROM	24	9.5
OTHERS	54	21.4
DM & HTN	10	4.0
NIL	60	23.8
Total	252	100.0

The distribution of the study population based on the presence of risk factors shows that 31.0% had diabetes mellitus (DM), 10.3% had hypertension (HTN), 9.5% experienced preterm premature rupture

of membranes (PPROM), and 21.4% had other risk factors. Additionally, 4.0% had both DM and HTN, while 23.8% had no risk factors.

**Table 8: Distribution of study population based on onset of labor**

Onset of Labor	Frequency	Percentage
Induced	82	32.5
Spontaneous	170	67.5
Total	252	100.0

The distribution of the study population based on the onset of labor indicates that 67.5% of the participants experienced spontaneous labor, while 32.5% had labor induced.

**Table 9: Distribution of study population based on type of caesarean section**

Type of caesarean section	Frequency	Percentage
Emergency	230	91.3

Elective	22	8.7
Total	252	100.0

The distribution of the study population based on the type of caesarean section (CS) shows that 91.3% of

the procedures were emergency caesarean section, while 8.7% were elective caesarean section.

**Table 10: Indications for caesarean sections in the study population**

Indication	Frequency	Percentage
Fetal Distress	90	35.7
Malpresentation	42	16.7
Placenta Previa	24	9.5
Failed Induction	16	6.3
MSAF unfavorable cervix	16	6.3
APH	12	4.8
FGR AEDF	12	4.8
Dysfunctional Labour	8	3.2
Medical disorders	8	3.2
Failed trial CPD	4	1.6
Others	20	7.9
Total	252	100.0

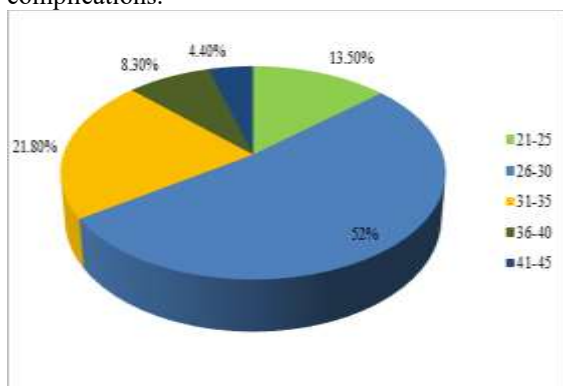
The caesarean sections (CS) in the study population were primarily indicated by fetal distress (35.7%), malpresentation (16.7%) and placenta previa (9.5%). Other notable indications included failed induction and meconium-stained amniotic fluid (MSAF) with an unfavorable cervix (both at 6.3%), antepartum

hemorrhage (APH) and fetal growth restriction (FGR) with absent end-diastolic flow (AEDF) (both at 4.8%), dysfunctional labor and medical disorders (both at 3.2%), and failed trial for cephalopelvic disproportion (CPD) (1.6%). Additionally, 7.9% of the cases were attributed to other various reasons.

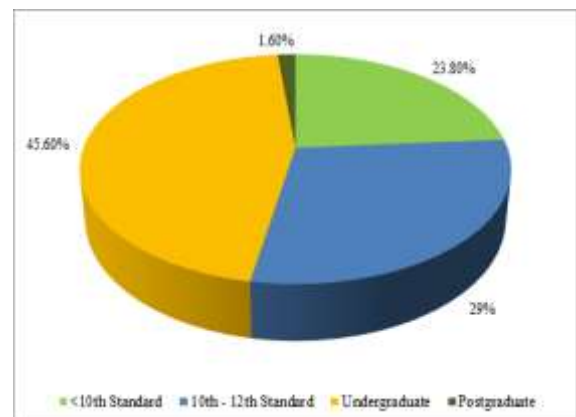
**Table 11: Post operative outcomes in the study population**

Maternal outcomes	Type of CS		Total N (%)
	Emergency N (%)	Elective N (%)	
Pyrexia	45(19.6%)	3(13.6%)	48(19%)
Surgical site Infection	26(11.3%)	2(9.1%)	28(11.1%)
Sepsis	5(2.2%)	1(4.5%)	6(2.4%)
None	154(67%)	16(72.7%)	170(67.5%)
Total	232(100%)	22(100%)	252(100%)

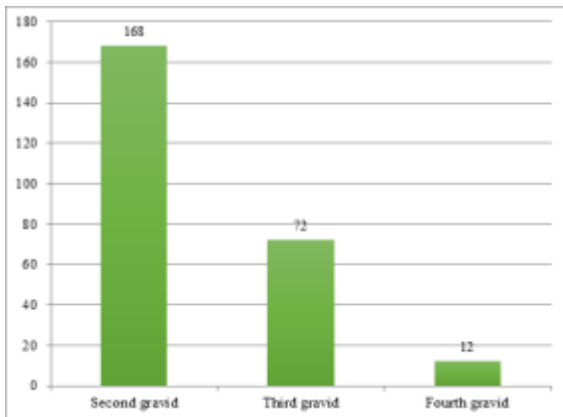
Postoperative outcomes in the study population varied by type of caesarean section (CS). Among those who underwent emergency caesarean section, 19.6% experienced pyrexia, 11.3% had surgical site infections, and 2.2% developed sepsis. In comparison, for those who had elective caesarean section 13.6% experienced pyrexia, 9.1% had surgical site infections, and 4.5% developed sepsis. Overall, 67% of participants who had emergency caesarean sections and 72.7% of those who had elective caesarean sections reported no postoperative complications.



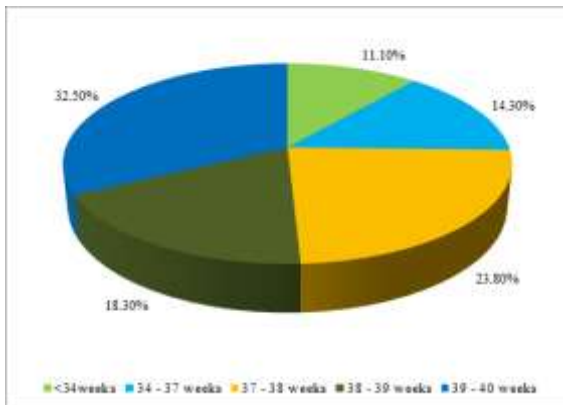
**Figure 1: Pie diagram showing distribution of study population based on age**



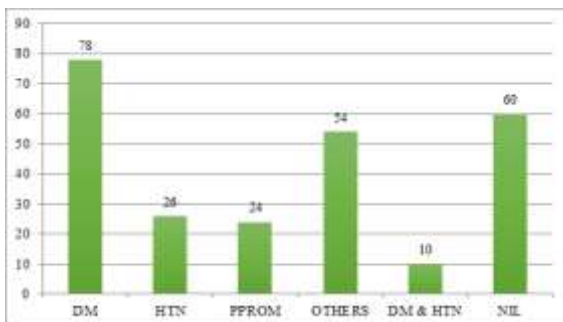
**Figure 2: Pie diagram showing distribution of study population based on education level**



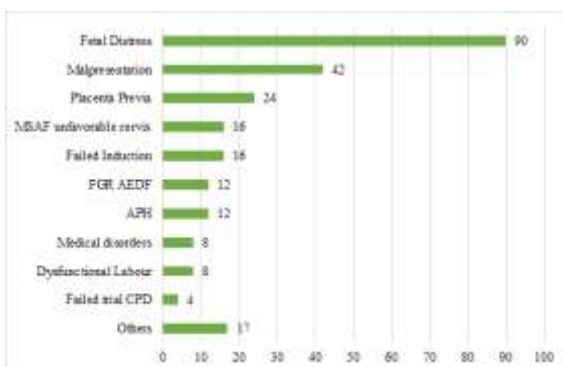
**Figure 3: Bar diagram showing distribution of study population based on gravidity**



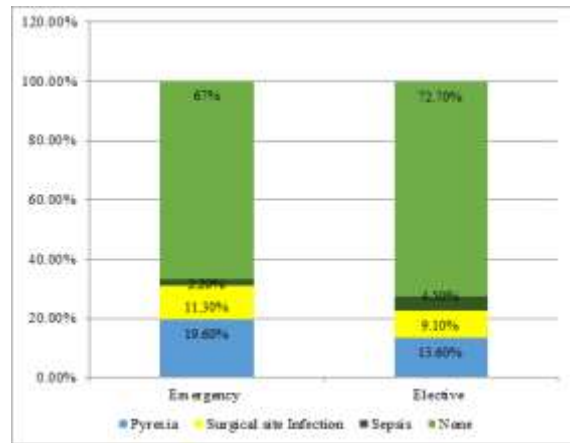
**Figure 4: Pie diagram showing distribution of study population based on gestational age**



**Figure 5: Bar diagram showing distribution of study population based on risk factors**



**Figure 6: Bar chart showing Indications for caesarean section in the study population**



**Figure 7: Component bar diagram showing distribution of study population based on Post operative complications and type of CS**

## DISCUSSION

The aim of this prospective observational study was to identify the indications of on primary caesarean sections performed in multigravida women with previous vaginal deliveries admitted at Government Medical College Kottayam. The study also aimed at identifying the maternal outcome among the study sample. The study enrolled a total of 252 participants during the specified one year study period. The participants' ages ranged from 21 to 45 years, with mean age of 30.10 years with a standard deviation of 4.93 years. The age distribution of the study population shows that the majority of study participants were in the 26-30 years age group, accounting for 52.0% of the participants. This is followed by 21.8% in the 31-35 years group, 13.5% in the 21-25 years group, 8.3% in the 36-40 years group, and 4.4% in the 41-45 years group. Hence majority of the multigravida with prior vaginal delivery belong to age between 26 years and 35 years. In a study conducted by Ramavath et al in a tertiary care centre in Andhra Pradesh, majority of the patients were from the age group of 21-30 years<sup>23</sup>. The educational distribution of the study population reveals that the majority of the study population, that is 45.6% consists of women with an undergraduate education. This is followed by 29.0% which includes those who completed 10th to 12th standard. 23.8% of the study sample had an education level less than 10th standard education and only a small portion, 1.6%, held postgraduate degrees. Hence 76.2% of the study sample had an education of 10th standard or above. The current study included multigravid women with pregnancy of more than 22 weeks gestation or more than 500 gm fetus, gravida two and above, each of whom has had a previous vaginal delivery and underwent a primary caesarean section. The study population's distribution based on gravidity indicates that 66.7% of the participants were second gravid 28.6% were third gravid and 4.8% were fourth gravida. Similar findings were noted in studies conducted at two different states in India. In a study

conducted by Meena et al to study on indications for primary cesarean section among multigravida women in a tertiary care center in Jhalawar out of the total 1968 deliveries occurred, 806 (40.95%) underwent cesarean section and 208 (25.80%) among these cesarean sections were primary cesarean section among multigravida. Majority of patients were gravida 2(63.67%).<sup>[28]</sup> In a study conducted by Rajput et al on primary cesarean section among multigravida women admitted at three major hospitals in Madhya Pradesh over a period of one year, they included multigravida more than 28 weeks gestation who had a previous vaginal delivery of more than 20 weeks gestation .Majority of them were gravida two (49.72%).<sup>[29]</sup>

The distribution of the study population based on the type of antenatal care services shows that 100% of the participants were booked cases, In a study on primary cesarean section among multigravida by Sailaja et al, among 95 multigravida, 31% were Booked cases and 69% were unbooked cases.<sup>[30]</sup> In a cross sectional study in a tertiary care centre at Nagpur by Somalwar et al which studied frequency indications and outcome of primary cesarean section in multiparous women ,they found that total number of deliveries during the study period were 3485, out of which 1649 (47.32%) were vaginal and 1836 (52.68%) were caesarean sections. The frequency of primary caesarean section in multiparous women was 5.73% of all deliveries whereas it constituted 10.89% of all caesarean sections. The study looked into 200 multiparous women who underwent primary caesarean section and 76% were unbooked cases.<sup>[31]</sup> Thus we in our study there were no unbooked cases. This can be explained as a reflection of better Antenatal registration activities in the community in Kerala .

Also in our study 41.3% were referred cases whereas 58.7 % were those who were on ANC services from the same institution. In a study conducted by Desai et al on primary caesarean section in multiparous women attending Obstetrics and gynecology department of SBKS Medical Institute and Research Centre at Gujarat 48.8% were direct cases whereas 45.3% were referred cases

The distribution of the study population based on gestational age reveals that 32.5% of the participants were operated between 39 and 40 weeks, 23.8% between 37 and 38 weeks, 18.3% between 38 and 39 weeks, 14.3% between 34 and 37 weeks, and 11.1% delivered before 34 weeks. Thus majority (50.8%) of study participants delivered between 38 weeks and 40 weeks of gestation. In a study conducted by Ramavath et al, majority of the patients were operated in the gestational age of 37-40 weeks (63%) followed by 27% who were operated during gestational age above 40 weeks .Patients who delivered during gestational age 34-36 weeks and 32-34 weeks were 7% and 3% respectively.<sup>[23]</sup> In our study also 56 %that is majority were operated between 37-40 weeks which is very similar to findings from study by Ramavath et al.

In the current study distribution of the study population based on previous obstetric history shows that 84.9% of the participants had a normal obstetric history, while 15.1% had an abnormal obstetric history. In a cross sectional study by Somalwar et al, in a tertiary care centre in Nagpur ,25.5% women had bad obstetric history.<sup>[31]</sup>

In the current study details of presence of risk factors was collected. Based on this, among the study participants, 31.0% had Diabetes Mellitus (DM), 10.3% had hypertension (HTN), 9.5% experienced Preterm Premature Rupture Of Membranes (PPROM), and 21.4% had other risk factors like Hyperthyroidism, fibroids, Bronchial Asthma, Inrhepatic Cholestasis of pregnancy .4.0% had both Diabetes Mellites and hypertension.23.8% gave no history of any of the above mentioned risk factors. In a study conducted by Sailaja et al, medical complications like Gestational Diabetes was present in 11.6% and pre-eclampsia was present in 9.5%.<sup>[30]</sup> In a study by Somalwar et al, analysis of preoperative obstetric complications found that 20% had anaemia, 18% had PIH, 15% had Premature Rupture of Membrane (PROM), 2% Gestational Diabetes Mellites (GDM),5.5% Ante Partum Haemorrhage (APH).<sup>[31]</sup>

In the current study among the multigravid women who underwent primary caesarean section, 58.7% were booked cases while 41.3% were referred cases. Also in the current study among the multigravid women distribution based on the type of caesarean section showed that 91.3% of the procedures were emergency caesarean section, while 8.7% were elective caesarean section. Thus majority of the cases had an emergency caesarean section. Similiar findings were observed in studies on primary caesarean section in multigravid women carried out in AFMC Pune and tertiary care centres in Rajathan Nepal and in Kerala .In a prospective observational study among 510 booked cases of multigravida who reported to antenatal OPD and who had only previous vaginal deliveries in the past ,proportion of emergency caesarean section included 74.7% and elective caesarean included 25.3%.<sup>[32]</sup>

In a tertiary care centre in Rajasthan, they evaluated 1968 deliveries. Among these 806 (40.95%) had cesarean section. Out of this 208 (25.80%) cesarean sections were primary cesarean section in multigravida. Maximum number of patients were gravida 2(63.67%) and gravida 3(24.52%). Majority of them (96.63%) had emergency cesarean section.<sup>[28]</sup> In a study done by Shah et al in a tertiary care centre in Nepal between June 2020 and June 2021 ,among 1158 multiparous women, primary caesarean section was done in 155 (13.39%). Only 15 (9.67%) were booked cases. Emergency caesarean section was performed in 149 (96.12%).<sup>[33]</sup>

In a prospective study done at a tertiary care centre in Kerala, out of the 8146 deliveries during 2013-2014 around 2729 caesarean sections were done out of which comprises 33.50% of all deliveries. Incidence of primary caesarean section in parous women is

2.59% of all deliveries and accounted for 7.73% of all sections done. The study analyzed details of 211 cases of caesarean section which were done for the first time in multigravida during the study period of 1<sup>st</sup> April 2013 2014 and found that in 81.51% of women, caesarean section was done when they were in labor. Remaining 39 women (18.48%) were posted for elective caesarean section.<sup>[27]</sup> In a study conducted among 150 multigravid women in a tertiary care centre in Srinagar, 80% of them underwent emergency caesarean section whereas 30% had elective caesarean section. 61.3% out of 150 multigravid women were directly received in our labor room in labor without prior admission<sup>34</sup>.

In the current study, emergency caesarean sections in the study population were primarily indicated by foetal distress (38.7%), malpresentation (17.4%), failed induction (7.0%), meconium stained amniotic fluid with unfavourable cervix (7.0%), antepartum haemorrhage (5.2%), foetal growth restriction with absent end-diastolic flow (5.2%), dysfunctional labour (3.5%), placenta previa (3.5%), medical disorders (3.5%), failed trial for cephalopelvic disproportion (1.7%), and other indications (7.4%). These findings highlight the diverse clinical reasons necessitating emergency caesarean section among the study participants. The indications for elective caesarean section in the study population were primarily placenta previa (72.7%), followed by malpresentation (9.1%), foetal distress (4.5%), and other reasons (13.6%). These findings illustrate the specific clinical indications leading to elective caesarean section among the study participants.

In a study by Momon Sigh et al, maternal and fetal indications contributed 44% and 56% of the total primary caesarean sections in the study population. The most common maternal indications for caesarean section was failed induction (14.7%) while fetal distress was the commonest fetal indication for caesarean section followed by malpresentation.<sup>[32]</sup> In a study by Sailaja et al, foetal Distress was the indication in 29.5% of the cases which is very similar finding that we also obtained in current study. This was followed by Cephalo Pelvic Disproportion (CPD) in 17% and malpresentation in 10.5%.<sup>[30]</sup> Again in our study also malpresentations was a common indication for primary caesarean section in multigravida. In a study conducted by Mohan et al in a tertiary care centre in Manipur, malpresentations (23.3%), cephalopelvic disproportion (20%), antepartum hemorrhage (19.3%) and fetal distress (12%) were the main indications for primary caesarean section.<sup>[35]</sup> In a retrospective record based study by Meena et in a tertiary care centre in Jhalwar, the most common indication for primary caesarean section in multigravida patients was fetal distress (22.11%) followed by malpresentation (18.26%) cases<sup>28</sup>. In a study by Ramavath et al, most common indication for caesarean section was fetal distress (19%) followed by malpresentations (14%) and oligohydramnios (14%). Cephalo pelvic disproportion and Premature Rupture Of Membrane

with failed induction were the next common indications.<sup>[23]</sup>

In a study by Rajput et al, the most common indication for primary caesarean section in multigravida patients was malpresentation that is in 29.79% followed by fetal distress in 18.39% patients and antepartum hemorrhage in 18.39%.<sup>[29]</sup> In a study by Somalwar et al in a tertiary care centre in Nagpur, majority of multiparous women who underwent caesarean section had nonreassuring fetal status (47%) as indication for primary caesarean section. Non reassuring fetal status is characterized by fetal tachycardia or bradycardia. The other factors included malpresentations (13%), meconium stained liquor (13%) and obstructed labour.<sup>[31]</sup>

In an observational study conducted at District hospital Dharwad, to identify the indications, maternal and fetal outcome in primary cesarean in multiparous women, total number of primary cesarean section in multiparous women were 84 constituting 2.7% of the total deliveries during study period. Indications for cesarean section were severe oligohydramnios (22%), fetal distress (15.4%), and breech presentation (14%), premature rupture of membrane (12%). Intra operative findings were meconium stained liquor, post partum hemorrhage, thinned out lower segment and extension of incision. The post operative morbidity was present in 6 cases and included paralytic ileus, puerperal fever, urinary tract infection and wound gaping.<sup>[25]</sup> Thus any unforeseen factors can lead to need of a caesarean section in women who previously had a normal vaginal delivery. From our study and from studies elsewhere in India we could identify that foetal distress and malpresentations are common indication for both in elective as well emergency primary caesarean sections in multigravida though most common indication for elective caesarean section (CS) in the study population was primarily placenta previa.

In a prospective study of primary caesarean section in multipara women admitted at tertiary care hospital in western rural Maharashtra, out of the total 4648 deliveries 1705 were caesarean sections, that is proportion of caesarean sections were 36.68%. 194 sections were performed in multipara for the first time, that is 0.42% of total deliveries and 11.38% of total caesarean sections. Most common indication for caesarean section in multipara was malpresentation (19.6%) followed by fetal distress (16.49%) and severe pre-eclampsia (13.4%). The study concluded that that proper antenatal care should always be given to multipara even though there was history of previous vaginal deliveries<sup>36</sup>

In the current study among those who underwent emergency caesarean section 19.6% experienced pyrexia, 11.3% had surgical site infections and 2.2% developed sepsis. In comparison, for those who had elective caesarean section 13.6% experienced pyrexia, 9.1% had surgical site infections and 4.5% developed sepsis. Overall, 67% of participants who had emergency caesarean section and 72.7% of those

who had elective caesarean section reported no postoperative complications.

According to findings in the study by Sailaja et al, intraoperative complications were seen in 15.8% of the cases and the most common post-operative complication was puerperal pyrexia, which is very similar to our study findings. The commonest intraoperative complication was atonic PPH (6%) followed by extension of uterine incision (3.4%). Maternal morbidity was seen in 13.3%. Febrile morbidity was the commonest postoperative morbidity followed by urinary tract infections.<sup>[35]</sup> In this study also pyrexia is the most common maternal complications identified similar to findings from our current study. In a study by Ramavath et al, most commonly complication was atonic PPH which was observed in 7%. Puerperal pyrexia was observed among 5% patients. Wound gaping and Urinary Tract Infection was also observed.<sup>[23]</sup>

In a study by Rajput et al, most common maternal complication or outcome was pyrexia(10.36%).<sup>[29]</sup> In a study by Somalwar et al, on indications and outcome of primary caesarean section in multigravid women the common maternal outcomes included postpartum haemorrhage (12%) and fever (6%).<sup>[31]</sup> Thus one of the commonest post operative maternal outcome in mutigravida undergoing primary caesarean section included puerperal pyrexia which was a finding in our study too.

Postoperative outcomes in the study population varied by type of caesarean section (CS). Among those who underwent emergency caesarean section 19.6% experienced pyrexia, 11.3% had surgical site infections and 2.2% developed sepsis. In comparison, for those who had elective caesarean section 13.6% experienced pyrexia, 9.1% had surgical site infections, and 4.5% developed sepsis. Overall, 67% of participants who had emergency CS and 72.7% of those who had elective CS reported no postoperative complications.

## CONCLUSION

- This prospective observational study was carried out to study the indicators and outcome of primary caesarean sections in multigravid women with previous vaginal deliveries who were admitted at Government Medical College Kottayam during the study period. The study enrolled a total of 252 participants during the specified study period.
- The age of study participants ranged from 21 to 45 years, with mean age 30.10 years with a standard deviation of 4.93 years. Majority of the study population belonged to the age group 26 to 30 years.
- The distribution of study population based on gravida status indicated that 66.7%, that is majority of the participants were second gravid.

- 84.9% of the study participants had a normal obstetric history, while 15.1% had an abnormal obstetric history
- The distribution of the study population based on the antenatal care point shows that 58.7% of the participants were taking ANC from the Obstetrics and Gynecology department at the institution while 41.3% were referred cases. 100 % cases were booked cases in our study.
- The distribution of the study population based on gestational age reveals that majority that is about 56.3% of the study participants delivered between 37 and 40 weeks
- The distribution of the study population based on the presence of risk factors showed 23.8 % had no history of risk factors. Among those with history of risk factors most commonest risk factors were diabetes mellitus and hypertension.
- Majority of procedures were emergency caesarean section .Also majority of the cases experienced spontaneous labor, while only 32.5% had labor induced.
- Emergency caesarean sections in the study population were primarily indicated by fetal distress, malpresentation and failed induction Other factors that constituted lesser proportions include meconium stained amniotic fluid with unfavourable cervix Antepartum Haemorrhage foetal growth restriction with absent end-diastolic flow, dysfunctional labour, placenta previa failed trial for cephalopelvic disproportion, and other indications
- The indications for elective caesarean section were primarily placenta previa followed by malpresentation and foetal distress.
- Postoperative outcomes in the study population varied by type of caesarean section Among those who underwent emergency caesarean section majority experienced pyrexia followed by surgical site infections, and very small number reported sepsis. In elective caesarean section outcomes were similar like pyrexia and surgical site infections. But only a lesser proportion experienced surgical site infection in elective caesarean section.
- Overall, 67% of participants who had emergency caesarean sections and 72.7% of those who had elective caesarean sections reported no postoperative complications. Thus postoperative complications were comparatively less in elective caesarean section group.

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