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Complications seen in pregnancies with leiomyomas

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Abstract
Objective:
a. To assess the effect of pregnancy on leiomyomas.
b. Effect of leiomyomas on pregnancy
c. The maternal morbidity and mortality and
d. The perinatal outcome in pregnancies associated with leiomyoma.

Materials and Methods: This clinical study was conducted at Department of Obstetrics and Gynecology, MGM Medical College, Jamshedpur from July 2015 to June 2017 on 80 pregnant women diagnosed with uterine leiomyoma.

Results: Out of these 40 cases, 87.5% were more then 25 years old. Diagnosis was done by Antenatal ultrasound in 87.5% of cases. In 60 percent of cases, leiomyoma was subserous in location. In 50 percent of cases the size of Leionyma ranged from 10-50 cc in size. In 77.5% the leiomyma was single, but in 15 % of cases their number was three or more.

During the Period of Pregnancy the size of the leiomyoma: Remained unaltered in 87.5% cases, increased in size in 20% and decreased in size in 10% of cases 35% of cases developed complications out of which 12.5% percent has complete abortions.5.5% has placental abruption, 5.7% had premature rupture of membrane and 8.6% preterm labour.

22.5% of patients delivered vaginally whereas 65% if patient underwent lower segment caesarean section.

Indications for caesarean section were varied but major (26.9%) indication was malpresntation, 11.5% for myoma >30cc & 7.7% for leiomyoma in lower uterine segment.

Caesarean myomectomy was possible in 50% of patients: APGAR Score - 5.7% of newborns had an APGAR Score <7at 1 min, all had an AGAR Score >7at 5 mins. 22.9% of babies were lowbirth weight babies.

Conclusion: It is difficult to predict the course of leiomyoma in pregnancy. Once diagnosed regular & repeated followup examination helps in avoiding the complications and achieving good pregnancy outcome.

Keywords: uterine leiomyoma, pregnancy, threatened abortion

Introduction

Leiomyoma, commonly known as fibroid is the commonest benign tumour of the uterus. Histologically this tumour is composed of smooth muscle and fibrous connective tissue.

Incidence- It has been estimated that at least 20 percent of women at the age of 30 have leiomyoma in their wombs.

Fortunately, most of them (50%) remain asymptomatic. These are more common in Nulliparous or in those having one child infertility (Table-1) The prevalence is highest between 35-45 years.

Table 1: Risk Factors for Fibroid

Increased Risk	Reduaced Risk
▪ Nulliparity ▪ Obesity ▪ Hyperoestrogenic state ▪ Black Women	▪ Multiparity ▪ Smoking

The fibroid grows rapidly during pregnancy or amongst pill users (high dose pills) Rapid growth may also be due to degeneration or due to malignant change.

It is obvious from the above stated facts that the incidence of leiomyoma increases with advanced maternal age and in pregnancies occurring or planned late. In present times, many women marry late and delay childbearing due to carrear and other reasons.

As a result the obstertricians are facing more & mane cases of leiomyoma in Pregnancy.

The true incidence of leiomyoma in pregnancy is unknown, but reported rates vary from as low as 0.15 % of all pregnancies to as high as 12.5%.

Changes usually encountened in leiomyomas during pregnancy are as follows

1. Pedunculated sub-serous myomas may undergo torsion with necrosis to the extent that the myoma may be detached and later become parasitic, getting its blood supply through a highly vascularized omentum.
2. Red or carneous degeneration that is actually hemorrhagic infarction.
3. Presents with severe pain Abd myoma may get infected during the course of puerperal metritis or septic abortion,

and one especially likely to do so if the myoma is located immediately adjacent to the placental implantation site as a sound or a curette perforates the myoma.
4. Infarction of myoma increases the risk of infection and may necessitate hysterectomy for curing it.

These may occur in 5-8% of cases with potentially life threatening consequences.

Effect of pregnancy on myomas

Until recently, it was widely belived that leiomyomas almost always increased in size during pregnancy, likely as a consequence of estrogen stimulation. In fact based upon ultrasonic monitoring of the size and position of myomas, Lev-to-off and coworkers (1987) observed that only about half changed significantly in size during pregnancy. It was observed that specifically (a) during the first Trimester, leiomyomas of all sizes either remained unchanged or increased in size. (b) During the second trimester, smaller myomas (2-6cm) usually remained unchanged or increased in size.

Whereas – larger myomas become smaller.

Regardless of initial leio myoma size, during the third trimester leiomyomas usually remained unchanged or decreased in size.

The importance of these observation is that an accurate prediction of leiomyoma growth in pregnancy cannot be made.

Complications in pregnancy can arise as

1. As a result of effect of pregnancy on leiomyoma and also,
2. As a results of effect of leiomyoma an pregnancy.

Effects of Leiomyoma Location and Number on Pregnancy

1. The likelihood of caesarean section is increased especially if a leiomyoma is located in the lower uterine segment.
2. Also the risk of malposition and preterm labour is increased when there are multiple leiomyomas.
3. The risk of retained placenta is increased when there is a lower uterine segment tumour.
4. The implantation of the placenta over or in contact with a leiomyoma increases the chances of abortion, preterm labour and postpartum hemorrhage.
5. Degeneration of leio myomas apparently is associated with a characteristic sonographic pattern.
6. Incidence of caesarian section is increased. Cervical myomas may obstruct labor, may be confused with fetal head. It seems reasonable to perform serial ultrasonic examinations during pregnancy in woman with uterine leio myomas.

The complications include

First trimester bleeding miscarriages placenta previa, placental abruption, intrauterine growth restriction, premature Rupture of membranes, preterm labor, foetal malpresentation, labor dystocia, postpartum hemorrhage and uterine subinvolution. Therefore it is of utmost importance for the obstetrician to be wellversed with these possible complications and to outline the most sutaible management protocol for bringing about optimal pregnecy outcome for the mother and her baby.

This stydy was designed to assess the effect of pregnancy on leio myomas as well as the effect of leio myomas on pregnancy, the maternal morbidity and mortality, the prenatal outcome and the necessity for operative interference in pregnancies associated with leiomyoma in over country.

Materials and Methods

Study Design: This was a prospective clinical study xarried out on the pahents who came to MGM Medical College, Jamshedpur with Pregnancy accompanied by leiomyoma.

Study Population: This study was conducted in the department of obstetrics & Gynaecology, MGM Medical College and Hospital, Jamshedpur, over a period from July 2015 to June 2017. Eighty pregnant women diagnosed with uterine leiomyoma were included in the study.

Inclusion Criteria

1. Discovered during antenatal examination in clinics, Routine ultrasound scanning during pregnancy or with prior history of fibroid.
2. Presenting with complications like first trimester bleeding, miscarriages, severe abdominal pain, abruption, preterm labour, premature rupture of membranes, malpresentation, obstructed labour along with USG evidence of leiomyoma in pregnancy which was suspected to be the cause of aforementioned complications in emergency room.
3. Detetected in inpatients department on routine examination or imaging studies and complications arising there of.
4. Leiomyoma detected incidentally at time of caesarean delivery.

Exclusion Criteria

Those women with any preexisting medical or surgical disorders were excluded from the study.

After proper written consent all women recruited for the study were subjected to detailed history taking regarding age, parity, duration of marriage, socioeconomic status and obstetric history.

Specific clinical information including foetal presentation, presence of placenta previa, placental abruption, preterm labour, premature rupture of membranes and intrauterine growth restriction were elicited.

The women were follow up regularly every month by taking relevant history and by thorough clinical examination supported by relevant laboratory investigations and ultrasound. The number type, site and size of leiomyoma were recorded.

The size of leiomyoma were evaluated measuring the three main diameters (D1,D2,D3) and applying the formula of the ellipsoid (D1,D2,D3 x 0.52). An arithmetic mean of the sizes was used where two or more leiomyoma were present.

The changes in leiomyoma size over the course of pregnancy were calculated.

A 50% increase or decrease in size at the time of delivery and at the end of 6 weeks postpartum was considered significant while a change of less than 50% was interpreted as remaining unaltered.

The mode of delivery, duration of labour, need for operation interference and complication arising thereof along with occurrence of postpartum hemorrhage and sepsis were recorded.

The intrapartum, intraoperative (wherever applicable) and postpartum blood loss was assessed from the change in the haemoglobin percentage before and after delivery.

Women were subjected to an ultrasonographic evaluation at the end of 6 weeks following delivery to assess adequate uterine involution and to detect and determine the size of uterine leiomyoma and change therein. The neonatal outcome in terms of birth weight and APGAR score were recorded. All information was tabulated and incidence rates were calculated and analyzed.

Results

A total of 40 antenatal women fulfilling the inclusion criteria were recruited in this study after taking proper written consent and evaluated at necessary intervals.

The demographic characteristics (Table 3) of our group showed that, the age in 87.5% was more than 25 years. The majority (70%) being between 26-35 yrs. While none were less than 19 years of age. Seventy percent women hailed from urban areas. Primigravidae and multigravidae were equal in number.

Table 2: Distribution of mothers according to demographic characteristics.

Age (Years)	Number	Percentage (%)
20-25	10	12.5
26-30	32	40
31-35	24	30
>35	14	17.5
Residence		
Rural	24	30
Urban	56	70
Gravida		
Primigravidae	40	50
Multigravidae	40	50

The characteristics of leiomyoma are depicted in Table 2. In four (5%) mothers the placenta was located on the fibroid. Out of them one suffered a miscarriage and the other had first trimester bleeding with subsequent intrauterine growth restriction. In 87.5% mothers the leiomyoma was diagnosed by antenatal ultrasonography, either performed routinely or for some other indication like malpresentation. In only 2.5% of women, it was diagnosed prior to the present pregnancy. In 10% it was incidentally detected during caesarean section performed for some other indication.

Location wise 60% were submucous in 7.5%, rest 32.5% intramural. 50% were Moderate in size (10-50cc). 77.5% of them were single and only 15% were 3 or more in number.

Table 3: Distribution of mothers according to the characteristics of the uterine leiomyoma

Parameters		Number of patients (N=40)	Percentage (%)
Location	Retroplacental	4	5
	Non-retro placental	76	95
Mode of Diagnosis	Preconceptional	2	2.5
	Antenatal USG	70	87.5
	During LSCD (Lower Segment Caesarean Delivery)	8	10
Anatomic Type	Submucous	6	7.5
	Intramural	26	32.5
	Subserous	48	60
Volume (cc)	<10	32	40
	10-50 >50	40 8	50 10
Number	1	62	77.5
	2	6	7.5
	≥ 3	12	15

The effect of pregnancy on the size of leiomyoma (Table 4) was variable. Size remained unaltered in 60%. In 20% the size increased and in 10% the size decreased. At the end of puerperium, they were either not visualized or decreased in size in 87.5%.

Table 4: Distribution of mothers according to change in the volume of uterine leiomyoma

Change In Size	Antepartum (%)	End of Puerperium (%)
Decreased	8 10	16 20
Remained unaltered	48 60	8 10
Increased	16 40	2 2.5
Could not be assessed/no longer visualized	8 20	54 67.5

Complications developed in 28/80 (35%) of mothers (Table – 4)

Ten (12.5%) presented with threatened abortion, out of which size mothers suffered from complete abortion, two developed placental abruption and two developed intrauterine growth restriction.

Out of the total ten (12.5%) completed abortions eight mothers had a leiomyoma size more than 10cc at the time of detection and two had placenta implanted directly over multiple small intramural leiomyomas.

Four (5.7%) had to undergo emergency caesarean section for placental abruption.

Two (2.9%) mothers had placenta previa with breech presentation and underwent caesarean section for the same at term with delivery of healthy newborn.

Four (5.7%) mothers developed premature repture of membranes.

Six (8.6%) suffered preterm labour of which four had leimyoma measuring >10cc at the time of detection.

In 22.9% pregnancies there was foetal malpressentation, most common being breech presentation in 20%, Sixteen babies (22.9%) were of low birth weight.

Only six (8.6%) mothers suffered postpartum haemorrhage. All of them had huge intramural leimyoma (>30cc). Again only 14(20%) mothers showed subinvolution of the uterus 12 of them had large sub mucous or intramural fibroids (>30cc) and three had multiple leiomyomas.

Table 5: Distribution of mothers according to various pregnancy complications observed in the study.

Pregnancy Complication	Number of Mothers	Percentage (%)
Threatened abortion	10/80	12.5
Inevitable abortion	10/80	12.5
Placenta Previae	2/70	2.9
Placental abruption	4/70	5.7
Premature rupture of membranes	4/70	5.7
Preterm labour	6/70	8.6
Malpresentation	16/70	22.9
LBW Baby	16/70	22.9
PPH	6/70	8.6
Subinvolution	12/70	17.1
Retained Placenta	2/70	2.9

10 mothers had miscarriage requiring D & E. 70 completed their pregnancy.

Regarding the mode of termination of pregnancy (Figure-1) the majority – 52 (65%) underwent caesarean delivery (LSCD) and only 18 (22.5%) had original delivery. The rest i.e. 10(12.5%) pregnancies miscarried and necessitated surgical evacuation.

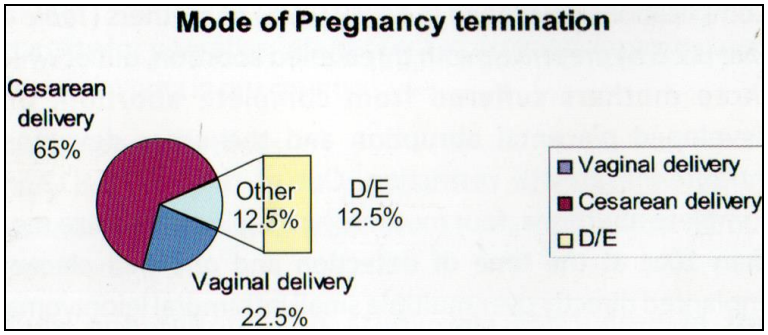

Fig 1

Amongst the various in dications (Table-5) for LSCD [lower segment caesarean delivery] the commonest indication was malpresentation (26.9%) Other indications were previous CS (23.2%)

Obstetric indications were

Previous CS (23.2%), obstertric indications (19.2%), large myoma (730cc) 11.5% and leiomyoma in lower uterine segment (7.7%)

Among the 26 women who required caesarean delivery, caesarean myomectomy was possible in 13 (50%) patients and there were no significant intra operative or postoperative complication due to the procedure.

Table 6: Distribution of mothers according to indication for caesarean section

Indications	Number of Mothers	Percentage (%)
Malpresentation	14	26.9
Large Leiomyomas	6	11.5
Leiomyoma in lower uterine segment	4	7.7

Previous caesarean section	12	23.2
Placental abruption	4	7.7
Premature rupture of membranes (PROM) with unfavourable cervix	2	3.8
Other obstetric causes (fetal distress, CPD, induction failure, etc.)	10	19.2

In the new born (Figure-2) only 5.7% had an APGAR score less than 7 (<7) at 1 minute, all had an APGAR score > 7 at 5 minutes.

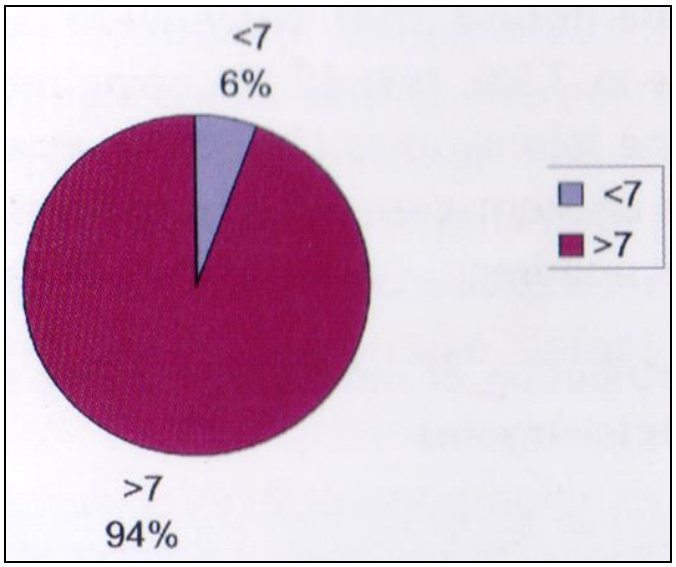

Fig 2: APGAR score at 1 minute in deliveries in pregnancies with leiomyomas.

Among the 50 women who required caesarean delivery, caesarean myomectomy was possible in 25(50%) patients and there ware no significant introperative or postopera tive complications due to the procedure.

Discussion

Uterine leiomyomas are frequently found in pregnant women with multifarious consequences. This study provided us with an insight into the life cycle of leiomyoma in pregnancy. The higher incidence (87.5%) in older age group (>25yrs) showed that elderly mothers have a higher chance of having leiomyomas in pregnancy. Other studies have shown similar association with fibroids in 95.9% of pregnant women more than 25 years of age, or the mean maternal age in pregnancies with leiomyoma being 33.7 years.

Traditionally, it was believed that leiomyomas continued to grow throughout pregnancy under the stimulatory effect of pregnancy hormones. We noted that in 60% of cases the size remained unaltered and only 20% increased in size. Similar observations have in made in other studies. These studies have shown that 50% of all leiomyomas do not change significantly in size during pregnancy. Why different fibroids respond differently can be explained by altered distribution and response of oestrogen and progesterone receptors in the fibroids. This is just like their unpredictable behavioural pattern in non-pregnant individuals.

The antepartum complication rates of 10% to 40% and the risk of pregnancy complications are cited by many studies and is influenced by both myoma type and size.

Bajehal *et al* stated that different types of leiomyomas may affect reproductive outcomes to different extent and they suggested that submucous leiomyomas were more responsible for infertility and miscarriage while subserous were the least responsible and intramural types had an intermediate role.

We had 77.5% pregnancies with a single leiomyoma, 60% being subserous, 95% not located retro-placentally and 50% of moderate size (10-50cc). Thus we had very few complications in our study.

Our complications included threatened miscarriage (12.5%), inevitable abortion (12.5%), foetal representations (22.9%), placental abruption (5.7%), preterm labour (8.6%), PROM (5.7%), placenta previa (2.9%), PPH (8.6%), and subinvolution (20%). Various other observations reported 17% incidence of threatened abortion compared to only 10% of women who did not have leiomyomas.

We observed that foetal malpresentation was most consistently associated with large intramural and submucous leiomyomas which caused deformity of uterine cavity. Other studies have also recorded increased rates of malpresentation, with a four-fold increase in breech presentation (12.6% compared with 3% in controls) the risk increasing in multiple or lower uterine segment leiomyoma.

In our series, placental abruption was associated with retroplacental leiomyoma. Studies have documented a nearly four-fold increase in placental abruption in pregnancies with myomas, especially with retroplacental location of leiomyomas. Abruption was seen in 7.5% of these pregnancies as compared to only 0.9% pregnancies without leiomyoma. However, many studies have failed to show such associations.

Traditionally, uterine leiomyomas have been associated with increased risk of preterm labour, the risk increasing with myoma larger than 6 cm or with multiple myomas and close

proximity of myoma with placenta. We had only 8.6% preterm labour as most myomas were subserous and of moderate size.

Leiomyomas have been thought to decrease the force of uterine contractions or disrupt the coordinated spread of the contractile wave and thereby, lead to dysfunctional labour, with prevalence of 4.12% in the leiomyoma group versus 1.65% in the control group. We did not have any dysfunctional or obstructed labour as described by others. A leaning towards caesarean delivery in 84% pregnancies with uterine leiomyomas in our series corroborates with the findings of many of the previous studies. Very large 5 cm or larger leiomyomas are independently associated with caesarean section performed before labour and risk increases with the size of leiomvoma. We found that in as many as 23% women caesarean delivery was done solely due to large myomas (>10 cm) and thus, size of the leiomyoma was definitely a risk factor for caesarean section. In contrast, few studies showed that caesarean rate was not statistically increased in pregnancies with leiomyomas and was not different when leiomyomas were more than 10cm.

We did not have retained placenta, increased third stage bleeding, puerperal sepsis or wound infection in this study. We had few postpartum complications like haemorrhage or subinvolution. Numerous studies in literature have also failed to find a positive association between leiomyoma and postpartum haemorrhage. However, retroplacental location of leiomyoma leads to increased incidence of postpartum haemorrhage.

Amongst our 8 low birth weight babies only 4 had intrauterine growth restriction. This could not be directly linked to the leiomyoma. This is in keeping with most recent literature that suggests uterine leiomyomas are not significantly associated with intrauterine growth restriction. Lower placental complications in our study including placenta previa, retained placenta, IUGR and PPH may be attributable to non-retroplacental location of leiomyomas in 95% of cases.

This study also like others demonstrated that foetal outcome was not adversely affected in the presence of uterine leiomyomas. There was no incidence of any asphyxial or non-asphyxial morbidity, foetal malformations or neonatal death. All our babies had APGAR> 7 at 5 minutes.

We successfully performed myomectomy during caesarean section in 13/26 (50%) cases, without any adverse intraoperative and postoperative complications. Recent studies have similarly demonstrated that caesarean myomectomy is not as dangerous as generations of obstetricians have been trained to believe. No significant difference was found in relation to mean time taken for surgery, amount of blood loss, postoperative pain and mean duration of hospital stay. Most obstetricians found that enucleation of the fibroid is technically easier in gravid uterus owing to greater looseness of the capsule. Retraction of uterine muscles is enhanced by oxytocic agents to help arrest the haemorrhage.

Conclusion

Leiomyomas may be anticipated in elderly pregnancies with increased risk of threatened or inevitable miscarriage, malpresentations, and placental complications like abruption, placenta previa, PPH and IUGR in retroplacental leiomyomas. Labour complications and the need for caesarean delivery may be related to pregnancies with large (>10 cm), multiple and submucous fibroids distorting the uterine cavity. The neonatal outcome is not adversely affected by leiomyomas. In selected patients, myomectomy during caesarean delivery does not appear to result in an increased risk of intrapartum or short-term postpartum morbidity. What was once thought to be taboo should now be reconsidered. Although caesarean myomectomy still cannot be universally advocated, it will continue to remain the surgeons' prerogative. With careful selection of patient, experienced surgeon and efficient haemostatic measures, the procedure does not seem hazardous as was thought earlier.

We hope that observations of our study will be clinically useful to physicians and obstetricians enabling them to optimize treatment modalities for pregnancies with leiomyomas in order to achieve a healthy mother and a healthy baby.

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