

Original Research Article

To compare anatomical changes & histopathological findings in placenta of normal and IUGR

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Abstract:

Background & Method: The aim of this study is to compare anatomical changes & histopathological findings in placenta of normal and IUGR. The patient was subjected to routine general physical examination and two consecutive USG atleast four weeks apart was taken. The fetal weight and outcome was recorded immediately after birth. The placenta with membrane and cord were preserved in formalin and sent for anatomical and histopathological examination. The placenta was examined for its colour, weight, diameter, thickness and number of cotyledons infarcted and calcified area.

Result: Number of LSCS deliveries in IUGR patients (31) is significantly more than control group (16). The number of stromal fibrosis areas / LPF (>5) in IUGR (157) is significantly higher compared to control group (02). The number of stromal hyalinization area (>5) in IUGR (52) is significantly higher compared to control group (36).

Conclusion: The placenta of IUGR ages earlier than control group and there is also an increased incidence of caesarean delivery. Histopathological findings in low power field like syncytial knot formation, cytotrophoblastic cellular proliferation, stromal fibrosis, calcification and hyalinisation of villi and stroma are also found as normal aging changes in placenta but it occur early and more frequently per low power field in IUGR group.

Keywords: anatomical & histopathological, placenta, normal and IUGR.

Study Designed: Observational Study.

1. INTRODUCTION

Maternal blood is discharged in a pulsatile fashion into the intervillous space by 80 to 100 spiral arteries in the decidua basalis[1]. It spurts toward the chorionic plate and flows slowly around the villi, eventually returning to the endometrial veins and the maternal circulation. The maternal arteries which open into the intervillous spaces are partially occluded by a plug of cytotrophoblastic cells, presumably to regulate blood flow. There are about 150 ml of maternal blood in the intervillous spaces, which is exchanged 3 or 4 times a minute[2].

During the first 12 weeks, the fluid in the intervillous spaces is a filtrate of maternal plasma without blood cells. During this period, the fetus has embryonic hemoglobin which binds oxygen under very low tension. After 12 weeks, maternal blood cells appear in the intervillous spaces, and the fetus produces fetal hemoglobin which requires a higher oxygen tension[3].

Maternal surface is rough and irregular and is mapped out into 15-30 polygonal areas known as cotyledons which are limited by fissures[4]. Each fissure is occupied by a placental septum. Peripheral margin is continuous with the foetal membrane which consists from outside inwards of fused decidua parietalis and capsularis, chorion laeve and amnion. The uterine (maternal) surface of the placenta is opaque, as it is an artificial surface originating as a result of laminar degenerative process led to the separation of the organ.

The placenta consist of chorionic plate on the foetal side, basal plate on the maternal side while stem villi extending between these plates, & intervillous spaces between the stem villi is filled with the maternal blood[5]. The human placenta at term is a local, disk-like thickening of the membranous sac that is achieved by splitting the membranes into two separate sheets, the chorionic plate and the basal plate. Both sheets enclose the intervillous spaces, as cover and bottom. The intervillous space is perfused with maternal blood, which circulates, directly around the trophoblastic surfaces of the placental villi[6].

2. MATERIAL & METHOD

The present study entitled “To compare anatomical changes & histopathological findings in placenta of normal and IUGR” was conducted in the Department of Obstetrics and Gynaecology. at Tertiary Care Centres of M.P. for One Year. 100 were normal patients without IUGR and 100 with IUGR. These patients were evaluated with the help of semistructured proforma consisting of various socio-demographic and clinical variables.

The patient was subjected to routine general physical examination and two consecutive USG atleast four weeks apart was taken. The fetal weight and outcome was recorded immediately after birth. The placenta with membrane and cord were preserved in formalin and sent for anatomical and histopathological examination. The placenta was examined for its colour, weight, diameter, thickness and number of cotyledons infarcted and calcified area. Any missing lobe or gross placental abnormality was observed. The cord examine for position of insertion and abnormality.

Inclusion criteria:

1. Patients with baby birth weight of < 10th percentile of gestational age.
2. IUGR due to all causes.
4. Informed consent.

Exclusion criteria:

1. Preterm patients.
2. Lack of consent.
3. Damaged placenta.

3. RESULTS

Table 1: Mode of delivery

Outcome	Control		IUGR	
	No.	%	No.	%
LSCS	16	16	31	31

Vaginal	84	84	69	69
Total	100	100%	100	100%

Number of LSCS deliveries in IUGR patients (31) is significantly more than control group (16). (Chi square value 11.33, p value 0.0008)

Table 2: Diameter of Placenta

Diameter (cm)	Control	IUGR
Mean diameter	25.8	20.61

(p < 0.05)

Table 3: Number Of areas of stromal fibrosis

Number Of stromal fibrosis areas / LPF	Control		IUGR	
	No.	%	No.	%
≤ 5	98	98	21	21
> 5	02	02	79	79
Total	100	100%	100	100%

The number of stromal fibrosis areas / LPF (>5) in IUGR (157) is significantly higher compared to control group (02). Chi square value 73.3 and p 0.000

Table 4: Number Of areas of stromal hyalinization

Number Of stromal hyalinization area	Control		IUGR	
	No.	%	No.	%
≤ 5	64	64	48	48
> 5	36	36	52	52
Total	100	100%	100	100%

The number of stromal hyalinization area (>5) in IUGR (52) is significantly higher compared to control group (36). Chi square value 10.4 and p .001

4. DISCUSSION

In our study delivery by caesarean section in IUGR group was in 29.5% patients as compared to 16.5% of the control group, reported a significantly higher incidence of caesarean section in IUGR[7].

IUGR babies that have placental insufficiency have a greater risk of hypoxemia, which makes them less likely to tolerate labor and more likely that a caesarean delivery will take place. Approximately one half of infants with IUGR have intrapartum asphyxia and lower APGAR scores than control subjects. A higher incidence of meconium aspiration has also been noted in these infants[8]. Therefore, continuous monitoring of fetal heart rate throughout labor is recommended and a lower threshold for the choice of caesarean section is therefore recommended.

Histopathological studies of the placenta in IUGR indicate abnormalities of the maternal spiral arterioles, dysregulated villous vasculogenesis, and abundant fibrin deposition are characteristic in IUGR[9].

Infarction, intervillous fibrin deposition, stromal fibrosis in significant cases of IUGR. Syncytial knots formation, cytotrophoblastic cellular proliferation, stromal fibrosis, calcification and hyalinisation of villi is up regulated by intra placental hypoxia and down regulated by increasing intra placental oxygen levels[10]. This also indicates a degenerative process as response to local hypoxia. This is considered an adaptive phenomenon to reduce

the diffusion distance from the intervillous space to the fetal capillaries in the presence of reduced oxygen tension. The findings of our study correlate to those of other authors.

5. CONCLUSION

The placenta of IUGR ages earlier than control group and there is also an increased incidence of caesarean delivery. Histopathological findings in low power field like syncytial knot formation, cytotrophoblastic cellular proliferation, stromal fibrosis, calcification and hyalinisation of villi and stroma are also found as normal aging changes in placenta but it occur early and more frequently per low power field in IUGR group.

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