

STUDY OF HISTOPATHOLOGICAL CHANGES IN PLACENTA AFTER INTRA AND EXTRA AMNIOTIC INSTILLATION OF PROSTAGLANDIN

by

NEELA SHARMA

and

KAMLA ACHARI

SUMMARY

Placental findings show minimum damage to the tissue flanking the amniotic sac, while the decidua and parietal villi bear the brunt of the damage. This shows lack of direct tissue toxicity of PG $F_{2\alpha}$ and atleast in the dose used.

Generalised myometrial Contracture causing mechanical shearing of the placenta from the adjacent decidua produces high frequency of decidual haemorrhage involving marginal zone. Acute intervillous hypertension, secondary to contraction of the sub-placental myometrium usually causes pre-dominantly acute basal decidual haemorrhage and probably plays a minor role in the causation of the decidual haemorrhage of prostaglandin abortion.

Introduction

Prostaglandins have now come up as the most effective and sophisticated measure for inducing abortion days. Its mode of action is not yet very clear, nevertheless, it is believed that it acts by way of increasing uterine contraction and thus expulsion of conceptus. Search is going on to study its mode of action, side-effects, immediate and delayed complications.

There is paucity of work related to placental changes in prostaglandin induced abortion in comparison to the marked decidual changes in hypertonic saline abortion. The decidua which lies outside the amniotic sac, is thought to be target for the action

of hypertonic saline. It is further assumed that the release of PGF₂ alpha into the amniotic fluid is caused by the damage to decidual cells, and that the diffusion of lysosomal enzyme into the decidual cells sap is the triggering mechanism for the release of prostaglandin, which initiates uterine contractions. By contraction acidosis is produced which triggers the mechanism of release of lysosomes from the decidual cells. So prostoglandin also must be producing changes in the decidua.

The present work aims at studying the histopathological changes in placenta in relation to the effect of the use of prostoglandins.

Material and Methods

Termination of pregnancy was done by injecting PG in 62 cases and placenta of each case was studied (Table I).

From: B.R.D. Medical College, Gorakhpur and Department, Obstetrics and Gynaecology, Patna Medical College, Patna.

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TABLE I

Total No. of cases	Intra-amniotic PG (15 to 20 wks.)		Extra-amniotic PG (10 to 20 wks.)	
	PGF α 50 mg	15 (S) 15 (methyl) PGF $^{2\alpha}$ (2.5 mg)	15(5) 15 (methyl) PGF $_2$ alpha	
62	11	14	37	

Placenta of 18 cases (out of which, in 4 suction evacuation was done and in rest hysterotomy) worked as control (Table II).

TABLE II

Total No. of cases	Suction evacuation 6 to 14 wks.	Hysterotomy 13 to 20 wks.
18	4	14

As the PG is contraindicated in the conditions, like heart diseases, respiratory diseases, kidney diseases, Diabetes mellitus so the patients suffering from above diseases were excluded from my series.

Out of 62 in 37 cases 15 S 15 (methyl) PG F2 alpha (1 mg) was used extraamniotically and in rest 25 cases termination was done by intra-amniotic route. In 25 intra-amniotic group, in 14 cases prostaglandin used was 15 S 15 (methyl) PG F2 α (2.5 mg) and in 11 cases PG F2 α (50 mg) was used.

Placenta from the above cases were studied macro and microscopically, placentae were carefully examined grossly and multiple blocks taken from the membranes, umbilical cord, chorionplate, decidua and

chorionic villi, were processed in routine histology.

Discussion

Acute decidual haemorrhage was present in 14 out of 62 cases (Table III). In series of Honor (1976) acute haemorrhage was present in 47 out of 60 placentae examined. As compared to Honor (1976) series placental rim was always involved and haemorrhage extended variably on to the adjacent decidua basalis and along the parietalis underneath the membrane and the chorionic villi away from the area of haemorrhage was distinctly pale and bloodless despite a fair amount of intervillous congestion. The umbilical cord, membrane and maternal floor showed only mild oedema with little congestion, necrosis and blood staining.

The major changes occurred in the decidua and chorionic frondosum. The decidua of most of placentae showed moderate vascularity (Table III), whereas Honor (1976) series show severe vascular engagement in haemorrhagic areas. The present series shows thrombosis in decidua in 18 cases (Table III). In contrast to local thrombosis of

TABLE III

No of cases	Decidual Changes											
	Vascularity			Thrombosis			Haemorrhage			Morphological changes		
	Less	Mod-erate	Se-vere	Less	Mod-erate	Se-vere	Less	Mod-erate	Se-vere	Nec-rosis	De-gene-ration	Inflam-matory cells
62	15	26	3	0	14	4	0	24	0	16	29	2

Honor (1976) series, present series shows haemorrhage in decidua in most of the cases between 13 to 18 weeks. Necrosis and degenerative changes in decidua was present in my 47 out of 62 cases (Table III).

In Honor (1976) series, extensive cell necrosis was present. Elsewhere degenerative necrotic changes predominated specially in the decidua marginalis and parietalis the interstitium was moderately oedematous.

Present series shows inflammatory cells in decidua in 2 cases (Table III). It has not been shown in series of other workers. Inflammatory cells might be present because of ascending infection through vagina as was obvious from the case history of 2 cases. In the first case membrane ruptured earlier and in 2nd case the patient was unmarried. She must have introduced some thing vaginally for termination of pregnancy.

The present series shows less vascular chorionic villi in most of the cases (Table IV) and the oedema in villi is present in 50 cases. Fifty-one cases showed vascularisation, degenerative changes and necrosis in three cases.

In Honor (1976) series the villous capillaries were strikingly underfilled through out and near the basal plate, the small villi were often totally bloodless.

Thickening of vessels was not seen in this series, neither in Honor's (1976) or Hingorani's (1974) series. Oedema of the wall was seen in 50 of my cases (Table IV) Honor series did not mention about oedema. Hingorani (1974) showed much oedema specially in extra-amniotic series.

This series show haemorrhage, thrombosis and fibrin deposition in intervillous space (Table V). Honor (1976) series show haemorrhage, thrombosis but no fibrin. Puri shows haemorrhage and fibrin but no thrombosis.

TABLE V

No. of cases	Changes in intervillous space		
	Haemorrhage	Thrombosis	Fibrin-deposition
62	47	9	45

Table (VI) shows subchorionic zone of haemorrhage, necrosis and fibrin deposition.

TABLE VI

No. of cases	Changes in Subchorionic Zone		
	Haemorrhage	Fibrin deposition	Necrosis
62	8	17	15

In this controlled group (Table VII) there was absence of oedema in membranes but the blood vessels of membrane were congested. Chorionic villi showed absence of necrosis in sub-chorionic zone, but presence of haemorrhage and fibrin. There was necrosis in decidua.

Summary and Conclusion :

Placental findings show minimum damage to the tissues flanking the amniotic sac., while the decidua and parietal villi bear the brunt of the damage. This shows lack of

TABLE IV

Changes in Chorionic Villi

No. of Cases	Vascularity			Oedema			Morphological changes		
	Less	Mod-erate	Se-vere	Less	Mod-erate	Se-vere	Vacuoli-sation	Necrosis	Degene-ration
62	37	1	13	0	43	7	45	3	11

TABLE VII

Placental findings of control cases

No. of cases	Type of abortion	Membrane		Chorionic villi		
		Oedema	Blood vessels	Sub chorionic zone of necrosis	Sub chorionic zone of haemorrhage and fibrin deposition	Decidual necrosis
18	Suction and Evacuation hysterotomy	Absent	Congested	Absent	Present	Present

direct tissue toxicity of PG F₂ and at least in the dose used. In contrast hypertonic saline causes extensive osmotic damage to the tissues adjacent to the amniotic sac. The primary tissue necrosis plays the main role in the induction of abortion although secondary factors are contributory.

Generalised myometrial contracture causing mechanical shearing of the placenta from the adjacent decidua produces high frequency of decidual haemorrhage involving marginal zone. Acute intervillous hypertension secondary to contraction of the subplacental myometrium usually causes predominantly acute basal decidual haemorrhage and probably plays a minor role in the causation of the decidual haemorrhage of PG abortion severity of the decidual haemorrhage will depend upon the dilution of PG or upon the level of placental implantation in the uterus. A decreasing fundus to isthmus gradient of reactivity to prostaglandin has been demonstrated in the human uterus. It is therefore, possible that high implantation is associated with severe bleeding due to violent contraction of the adjacent fundal myometrium while low implantation exposed to less violent contraction produces little or no haemorrhage. Implantation of placenta can be tested by ultra-

sound. Some failed PG abortion may be due to low implantation.

A significant drop in blood progesterone level has been seen to precede clinical abortion after PG administration. The widespread degenerative changes in the Villious trophoblast consistent with uteroplacental ischaemia and the intervillous congestion and thrombosis indicate intervillous stasis secondary to venous obstruction. The drop in progesterone could therefore, be due to a combination of factors i.e. reduced precursor availability, impaired steroid synthesis by the trophoblast and decreased progesterone delivery from the placenta. The possibility of a direct suppressive effect of PG F₂ α and on trophoblastic synthetic activity can not be evaluated in the present study.

It is possible that the degenerative change in the decidua are associated with lysosomal desensitization and secondary release of PG F₂ α and Decidual degeneration in these placentae contributes to the endogenous formation of PG F₂ alpha.

References

1. Hingorani, V.: *Contraception*. 10: 13, 1974.
2. Honor, L. H.: *Prostaglandins*. 11(6): 1019, 1976.

See Figs. on Art Paper 1