

A HISTOLOGIC STUDY OF THE PLACENTA OF PATIENTS IN SALINE AND PROSTAGLANDIN F₂ ALPHA INDUCED ABORTIONS

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SUMMARY

Histology of placenta obtained after saline or prostaglandin infusion (40 cases each) was studied at Associated Group of Hospitals, Bikaner. Twenty placentas of spontaneous abortion group were taken as control. Women were 11 to 20 weeks pregnant. 200 ml of 20% hypertonic saline was infused intraamniotically, while 4 ml of (1000 microgram) PGF₂ alpha was injected extraamniotically in 40 cases. Abortions were complete in both groups. Mean abortion interval was 9.32 hours in PGF₂ alpha group, while 30 hours in saline group.

Histology of saline amnion infused placenta revealed marked edema of membranes. Subchorionic zone of necrosis, subchorionic haemorrhage, polymorph infiltration and deposition of fibrin, while in prostaglandin group, histology of placenta was similar to that of spontaneous abortion group except for the thickened chorionic vessels. In the prostaglandin group, subchorionic zone of necrosis and polymorph infiltration was totally absent. Their characteristic feature was thickened chorionic blood vessels.

It can be concluded that the histologic changes produced in the placenta by administration of prostaglandin F₂ alpha are similar to those produced by natural mid trimester abortions.

Introduction

Eventhough hypertonic saline amnion infusion has proven its effectiveness and a large margin of safety, it appears that there is an inherent death rate of around 10/1000,000 deaths are produced by the osmotic effect of the saline which produces tissue necrosis leading to overwhelming sepsis and defibrination syndromes (Berger *et al* 1974). Hence prostaglandins are replacing hypertonic saline amnion infusion as method of choice for second trimester abortion.

This study will compare placental histology of saline amnion infusion and prostaglandin (PGF₂ alpha) extra-amniotic injections.

Material and Method

The present study was conducted at Associated Group of Hospitals, Bikaner from November, 1976 to July, 1977. A mean dose of 2 ml (2 ml was diluted with 4 ml of Hyscon) of 15 (5) 15 methyl prostaglandin F₂ alpha (1000 microgrames) was administered with a disposable polyethylene catheter extra-amniotically in 40 cases who were 10 to 20 weeks pregnant. The average instillation to abortion in-

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terval was 9.32 hours. The parity of patient ranged from 2 to 5.

Forty women of 13-20 weeks pregnancy comprised the hypertonic saline induced abortion group. 200 ml of 20% hypertonic saline was infused into the amniotic cavity. Abortion was complete in all cases. Mean abortion time was 30 hours. Parity ranged from 0 to 5.

Twenty cases with spontaneous abortion of similar gestational age served as control. The placentas were fixed in 10% formaldehyde solution and sections were stained with H.E. stain in usual prescribed manner.

Observations

Histology in Spontaneous Abortion Group

Morphologically there was no change in placentae, both membranes, amnion and chorion were of normal appearance. There was no change in fetal and maternal surface. Microscopically oedema of membranes was present in 10% of cases. Subchorionic zone showed congestion in 95% of cases, but subchorionic zonal necrosis was seen only in 5 placentae. Deposition of fibrin was absent with variable amount of sub-chorionic haemorrhage. There was minimal amount of decidual necrosis (Photo 1 and Table 1).

Hypertonic Saline Induced Abortion

Histology revealed marked oedema of membranes and congestion of blood vessels. Sub-amniotic haemorrhage was seen in only 2 cases. Sub-chorionic zone of necrosis and haemorrhage seen. Fibrin deposition was a prominent feature. There was polymorphonuclear leukocytic infiltration in this group. Decidual necrosis was present in all cases,

TABLE 1. Showing Comparative Morphology and Histology of Placentae in Different Modes of Induction of Abortions

Sl. No.	Method of induction of abortion	Number of cases	Membranes		Chorionic Villi		
			Oedema	Blood vessels	Subchorionic some of necrosis	Subchorionic haemorrhage and fibrin	Decidual necrosis
1.	Spontaneous	20	Present in 10%	Congested in 95%	present in 2.5%	Present in 100%	Present in 50%
2.	Hypertonic saline induced	20	Present in 100%	Congested in 100% with thrombosis	Present in 100%	Present in 90%	Present in 100%
3.	Prostaglandin induced	20	Present in 15%	Congested in 65% thickened, but no thrombus	Absent	Present in 80%	Present in 35%

This table shows that the histologic changes in placentae of hypertonic saline induced abortions are more rather than the prostaglandin induced or the spontaneous abortions.

but in variable amount. No effect was seen on blood vessels of chorionic villi. Thickness of sub-chorionic zone of necrosis was variable, but it was not related to induction abortion interval.

Prostaglandin Induced Abortion

In this group, membranes showed absence of oedema or inflammation in comparison to the saline group. Chorionic blood vessels were congested and thickened. Characteristic finding was absence of sub-chorionic zone of necrotic villi. Intravillous haemorrhage was present in 80% of cases. Only 35% of cases decidual necrosis and fibrin deposition was seen (Table 1).

Discussion

Characteristic histologic changes were observed by various workers in placenta and membranes of hypertonic saline induced abortion. Stamm and Dewatteville (1954) described the necrosis of placenta, but did not study the placenta, whereas Jaffin *et al* (1958) observed the intervillous thrombosis, but they did not report any change in the amniotic villi or membranes. Bengtsson and Stromby (1962) on the other hand observed the damage to the amnion, inflammation and necrosis of the chorionic villi and intravillous thrombosis. Jakobovite in 1970, observed sub-amniotic haemorrhage. Later on Christu *et al* (1966) observed findings in consonance with Bengtsson Stromby (1962), but their changes were less extensive in their opinion.

Puri *et al* (1980) observed marked oedema of membranes, thrombosis of chorionic vessels, sub-chorionic zone of necrosis which consisted of necrotic villi, intervillous haemorrhage, fibrin deposi-

tion and marked polymorphonuclear infiltration which is in consonance with our observation (Table 1).

Jakobovite *et al* (1970) stated that injection of hypertonic saline causes thrombosis and necrosis primarily due to its direct osmotic or chemical effect which are invariably associated with polymorphonuclear infiltration either as a primary change or a secondary manifestation following necrosis.

Prostaglandin infused placentae showed oedema, but that was very slight, while chorionic vessels were markedly thickened, but the lumen contained no thrombi. The subchorionic zone of necrosis which was seen in saline infused placenta was absent, there was no infiltration with polymorphs. Variable amount of intervillous haemorrhage and fibrin deposition was noted. The decidua underneath the Nitabuch's membrane showed focal to extensive area of necrosis. But on comparison, the same amount of necrosis was present in saline-infused and as well as in spontaneous aborted placentae.

On the basis of these findings it is difficult to explain the cause of fetal death. Thickened chorionic blood vessels explain its well known effect on smooth muscles and expulsion of fetus results by producing uterine contraction. Except for the marked thickening of blood vessels similar histologic changes were in the spontaneous aborted group.

Berger *et al* (1974) reported maternal mortality after saline infusion. They stated an inherent death rate of 10/10,000 with saline infusion. On comparing the results of histology in saline and prostaglandin placenta one can comment that absence of sub-chorionic zone of necrosis and polymorphonuclear infiltration in the

placentas in cases of prostaglandin induced abortion is responsible for the lack of serious sepsis and defibrination associated with prostaglandin induced abortion.

References

1. Berger, G. S., Tietze, C., Parter, J. et al: *Obstet. Gynec.* 43: 315, 1974.
2. Bengtsson, L. P. and Stromby, N.: *Acta Obstet. Gynec. Scand.*, 41: 115, 1962.
3. Christie, J. L., Anderson, A. B. M., Turnbull, A. C. et al: *J. Obstet. Gynec. Br. Commonw.*, 73: 399, 1966.
4. Jakobovits, A., Traub, A., Farkas, M. and Morway, J.: *Int. J. Gynec. Obstet.* 8: 499, 1970.
5. Jaffin, H., Kerenyi, T. and Wood, E. C.: *Am. J. Obstet. Gynec.* 84: 602, 1958.
6. Puri, S., Allen, F. and Sehulman, H.: *Obstet. Gynec.* 48: 216, 1976.
7. Stamm, O. and deWatteville, H.: *Gynec. Obstet. (Paris)*, 53: 171, 1954.