

## A STUDY OF THE UMBILICAL CORD IN PREMATURE LABOUR

by

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Age changes in the premature placenta may be related to age changes in the umbilical cord and this may throw some light on the sequence of events of premature labour.

Benirschke (1961) studied the normal umbilical cord. He said that the number of vessels must be looked for. Further, the absence of one umbilical artery may be associated with twins or other abnormalities of the foetus. However, absence of one artery was found in perfectly normal babies as well. In addition he stressed the importance of locating foetal remnants in the umbilical cord, such as the presence of the allantoic and omphalomesenteric duct.

He also emphasized the importance of observing other histopathological changes such as mural or occlusive thrombi and degenerative changes in the vessel walls.

### Material and Methods

One hundred and two specimens of umbilical cords were taken for study. Eighty-six were from cases of premature labour from between 28-37 weeks of gesta-

tion, while 16 were from full term normal deliveries. These cases were taken from the KNM Hospital and SRN Hospital, Allahabad. The premature labour group of cases included complications such as anaemia, antepartum haemorrhage, twins, toxæmia, hydramnios and hepatitis complicating pregnancy. Specimens of the umbilical cords were taken from near their attachment to the placenta immediately after delivery of the child. They were fixed in 10% formalin and were then processed, embedded and the section cut and stained accordingly.

The following points were noted:

1. Number of umbilical vessels.
2. Presence of foetal remnants.
3. Thrombosis in the lumen and wall of the blood vessels
4. Signs of degeneration such as fibrin deposition and inflammation.

### Observations and Discussion

**Umbilical Vessels:** All the umbilical cords examined had two umbilical arteries and one umbilical vein. No vestigial remnants were found in these cases, a finding stressed by Benirschke (1961).

**Degenerative lesions:** In the premature labour group, in 18 cases (20.88%) the umbilical cord showed normal umbilical vessels and a normal stroma.

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**A. Fibrin deposition:** Scattered fibrin deposition in the media of the umbilical vessels was seen in 12 cases (13.92%), between 28-32 wks. of gestation, while in the group of 33-37 wks. of gestation, heavy fibrin deposition was seen throughout the media of the umbilical vessels in all cases—56 cases (65.2%).

In the control group of 16 term cases, in 11 umbilical cords (68.7%), the umbilical vessels showed only scattered areas of fibrin deposition.

The presence of heavy deposits of fibrin in the umbilical vessels at 33-37 weeks of gestation, is much more than that seen at term, where only scattered deposits of fibrin are seen. As fibrin represents an aging phenomenon, it is presumed that the aged umbilical cord refuses to carry the pregnancy to term. Thus the onset of premature labour is nature's mechanism to salvage foetal life, and also, in some cases, probably to warn us of impending foetal death.

**B. Thrombosis:** Occlusive thrombi in the umbilical vessels was seen in 10 cases (11.6%). These were cases of macerated stillbirths, or, where the still birth was fresh, it was a consequence of antepartum haemorrhage.

In the control group of 16 live born infants, none of the umbilical vessels showed the presence of either mural or occlusive thrombi.

Thus it is inferred, that thrombosis may represent another premature aging phenomenon and that it is incompatible with life.

**C. Inflammation:** Inflammation of the umbilical cord was seen in 2 cases (2.1%) in the premature labour group, and here the patients had come with ruptured membranes.

#### Conclusion

All umbilical cords (65.20%) studied between 33-37 weeks of gestation showed the presence of fibrin. This showed as a heavy and uniform deposit throughout the media of the umbilical vessels.

On the contrary, umbilical cords from term placentae, showed only scattered areas of fibrin deposition. This suggests that premature aging of the umbilical vessels is consistently found in premature labour.

Thrombosis of the umbilical vessels was seen in 10 stillborn infants, and in no umbilical cord from babies born at term.

Inflammation of the cord was associated with premature rupture of membranes.

Fibrin deposition and thrombosis are both aging phenomena. Their presence in the umbilical cords from premature labour and stillborn infants suggests that they trigger off some unseen mechanism which precipitates the onset of premature labour, to save the foetus from impending death. Where the aging process has probably lasted for some time and where occlusive thrombi tend to interfere with the foetal circulation, there is a resultant foetal death.

#### Summary

One hundred and two specimens of umbilical cords from 86 cases of premature labour, and from 16 control cases of labour at term, were examined histologically.

Eighteen cases (20.88%) showed normal umbilical vessels and a normal stroma.

Fibrin deposition was seen in the media of umbilical vessels, in 68 cases (79.12%) of premature labour. There was a scattered fibrin deposition in 12 cases (13.92%) from between 28-32 weeks of gestation and heavy fibrin deposition in

all 56 cases (65.20%) from labour between 33-37 weeks of gestation.

Occlusive thrombi were seen in 10 cases (11.6%). All the babies were still-born and some were macerated as well.

Fibrin represents an aging phenomenon. It increased with increasing gestation in the premature labour group and was present in the umbilical vessels only as scattered deposits, in 11 out of 16 (68.7%) control cases of labour at term.

As fibrin represents an aging phenomenon, it is presumed that the aged umbilical cord refuses to carry the pregnancy to term, and the onset of premature labour is nature's mechanism to salvage foetal life. Thus, probably, it is a timely alarm warning us of impending foetal death.

Reference

1. Benirschke, K.: *Obstet. Gynaec.* 18: 309, 1961.

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