

MORPHOLOGICAL AND HISTOLOGICAL PATTERN OF HUMAN PLACENTA AND UMBILICAL CORD IN CASES OF INTRAUTERINE GROWTH RETARDATION

by

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SUMMARY

Morphological and histological changes in the placenta and umbilical cord were studied in Patna Medical College Hospital during the year 1972 to 1982. Abnormal forms of placenta such as circumvallate, circummarginate and battledore placentae were encountered in addition to abnormal cord insertion. Proliferation of Langhan's cell, syncytial knots, stromal fibrosis and obliterative endarteritis were common histological observation.

Introduction

Intrauterine growth retardation takes a heavy toll of perinatal life. It is difficult to elicit the exact cause. The placental unit which supplies nutrition to the foetus was studied with an aim to know the cause of intrauterine malnutrition.

Materials and Methods

There were a total of 150 cases of intra-

uterine growth retardation at term and 50 control cases. Among 150 cases, there were 60 cases of toxemia, 30 anaemia, 10 heart disease, 10 smoking and 40 idiopathic.

The cases were analysed according to age, parity, socio-economic status, family history, birth weight of the baby, morphology and histology of the placenta and cord in relation to S.G.A. and A.G.A.

Observation

TABLE I

Relation of Foetal Weight to Placental Surface Area and Placental Thickness to I.U.G.R.

No. of cases	Percentage	Average foetal weight in grams	Average placental weight in grams	Placental co-efficient	Surface area of placenta	Placental thickness in grams
10	6.6	1380.4	357.1	0.25	416.67	1.54
30	20.0	1780.2	400.7	0.22	465.52	1.50
110	73.3	2360.0	425.2	0.13	510.62	1.45

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TABLE II
Relation of Gross Appearance of Placenta in S.G.A. and A.G.A. Group

Types of placenta	S.G.A.		A.G.A.	
	No. of cases	Percentage	No. of cases	Percentage
Complete circumvallate	8	5.53	—	—
Incomplete circumvallate	4	2.66	—	—
Circum-marginate	4	2.66	—	—
Battledore	10	6.66	—	—
Small	124	82.6	50 (normal)	100

S.G.A. = Small for gestational age.

A.G.A. = Appropriate for gestational age.

TABLE III
Insertion of the Cord in the Placenta in Relation to S.G.A. and A.G.A.

Type of cord insertion	S.G.A.		A.G.A.	
	No. of cases	Percentage	No. of cases	Percentage
Eccentric	90	60	20	40
Central	40	26.6	30	60
Battledore	10	6.6	—	—
Velamentous	10	6.6	—	—

TABLE IV
Histology

	S.G.A.
Langhan's cell proliferation	Marked
Syncytial knots	Marked
Villous capillary	Reduced
Stromal fibrosis	Marked
Umbilical artery single	Toxaemia

Discussion

In majority of the cases of placental changes are after effect of reduction in the rate of maternal blood flow through the intervillous space.

The study was undertaken in 150 pregnant women with intrauterine growth retardation at term. It was mostly encountered in primigravida. The age varied between 16 to 30 years. Eighty per cent of

the women having growth retarded foetus belonged to low socio-economic group.

Regarding the weight of the placenta it was directly related to foetal weight. The placental co-efficient in all the cases were increased. Mallick *et al* (1979) however, did not find increase in the placental co-efficient in their study. According to Khatoon *et al* (1977) placental co-efficient was increased in I.U.G.R.

Rumblaz and Leons (1955), Morris *et al* (1955) Kloosterman (1956) found that small undernourished full term infants have usually a small placenta. In the present series, the weight of the infant was directly related to placental area but inversely related to the thickness of the placenta. The thick placenta may be the result of hypoxia and the cells undergoing proliferation as a result of it. It is postulated that bigger

size of the placenta having greater area of attachment in the uterus offers better circulation available for the nutrition of the foetus.

Incidence of perinatal mortality was higher in growth retarded foetus—45% in the present series with the foetal weight ranging between 1000 to 1500 gm.

According to Tables II and III abnormal forms of placenta were encountered more in growth retarded foetuses compared to those appropriate for gestational age.

In the present series according to Table IV the following histological changes were encountered. There was proliferation of Langhan's cells, the syncytial lining became thinner and almost attenuated. Formation of syncytial knots known as Tenny-change became more marked. The trophoblastic basement membrane was thickened. The stroma showed dilated capillaries filling up whole of the intervillous space. Many of them showed obliterative endarteritis. These changes are noticed in aging placenta also, but not to a great extent.

Single umbilical artery was found in 4

cases of eclampsia. There was no change, however, in the veins. Wharton's Jelly showed vacuolation in few cases which can be the result of tissue anoxia and oedema.

By and large the morphological and histological changes in placenta and cord were responsible for intrauterine malnutrition of the foetus on account of reduced maternal blood flow of essential nutrients, decreased placental surface area for exchange and depressed active transport mechanism.

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