

THE PLACENTA IN HYPERTENSIVE DISORDERS OF PREGNANCY

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SUMMARY

Sixty placentae of toxemic pregnancies were histopathologically analysed. Twenty placentae of normal pregnancies were examined as controls. Placental pathology worsens with progressive increase in hypertension. The fetal birth weight and gross fetal outcome is significantly correlated with the severity of placental pathology.

Introduction

There is voluminous literature which concerns itself with the effects of pre-eclampsia on the placenta; however few studies have correlated the degree of hypertension with the severity of placental pathology, and then to fetal outcome in its entirety, that is in respect of fetal weight, morbidity and mortality.

Material and Methods

At the Nowrosjee Wadia Maternity Hospital a study was conducted on 60 women who presented with a hypertensive disorder in pregnancy.

The criteria for diagnosis of pre-eclampsia were elevated blood pressure in excess of 140/90 mm Hg recorded for the first time after the 28th week of pregnancy with or without albuminuria.

The placentae were collected soon after delivery and evaluated by both gross and

microscopic examination. In addition to the 60 placentae of the toxemic patients, 20 placentae were collected from 20 normal patients and evaluated as a control group. The placentae were examined macroscopically; and then eight whole thickness tissue blocks were taken from each placenta, and sections were cut at 5-7 micron thickness to be stained with haematoxylin and eosin.

On microscopic examination, the placentae were evaluated for the following changes:

Circulatory disturbances—Infarcts; intervillous fibrin deposition; clubbing of chorionic villi and changes of endarteritis.

Parenchymatous changes—Hydropic change of villi and fibrinoid degeneration.

The placentae were then graded according to the severity of placental affection based on the microscopic findings by the following scoring system:

Score 0: Normal placenta and no fibrin or infarcts

Score 1: Fibrin deposition +

Score 2: Both infarcts and fibrin deposition.

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Initially, the hypertension was not categorised into mild or severe varieties as at the end of the analysis, we wanted to correlate the pathological picture and clinical outcome with the degree of hypertension.

Results

As seen in Table I, at blood pressure levels below 150/100 mm Hg all placentae were histologically normal. Hence the patients of toxemia were graded into two groups: Mild—B.P. less than 150/100 mm Hg and Severe—B.P. equal to or more than 150/100 mm Hg.

As seen in Table II, the feto-placental ratio decreases with increasing toxemia

and these findings are in agreement with those of Kher and Zawar (1981).

On gross examination, the major abnormalities in placentae of toxemic pregnancies were infarcts and visible plaques of fibrin deposition. These cannot be usually differentiated from areas of calcification and other nodular lesions, unless histopathological examination is performed.

These discrepancies on gross and histopathological findings were observed in the current study (Table III) with as many as 38.33% of the placentae showing a different picture on microscopic examination, as compared to the initial impression on gross examination.

TABLE I
Histopathological Correlation with B.P.

B.P. (mm Hg)	No. of cases	Histopathological score		
		0	1	2
Control	20	20	0	0
<i>PET</i>				
Less than 150/100	20	20	0	0
150/100 and more	40	10	4	26

TABLE II
Feto-placental Ratio

Group B.P. (mm Hg)	No. of cases	Average birth weight (gms)	Average placental weight (gms)	Feto-placental ratio
Control	20	2825	461	6.13
B.P. less than 150/100	20	2563	429	5.97
B.P. 150/100 and above	40	2091	366	5.71

TABLE III
Correlation Between Gross and Microscopic pathology

Gross finding	Microscopic findings	No. of cases	Per cent	
Normal	Normal	18	30.00	} 61.67
Abnormal	Abnormal	19	31.67	
Normal	Abnormal	11	18.33	} 38.33
Abnormal	Normal	12	20.00	
Total		60	100.00	

On comparing the fetal birth weight with the degree of placental pathology it was found that with an increased affection of the placenta, i.e. Score 2, the fetal weight decreased.

Also as in Table IV, the number of normal full term infants (Group 1) was significantly lower ($p < 0.05$) in those pregnancies where the placenta was severely affected (Score 2) as compared with those with normal placenta (Score 0).

TABLE IV
Histopathological Correlation with Fetal Outcome in PET group

Histopathological score	Fetal outcome groups		
	1	2	3
0	20	10	0
1	2	1	1
2	8	11	7

Fetal outcome:

Group 1—Normal full term infant.

Group 2—Infants which were Preterm
Growth retarded

Low Apgar score

Group 3—Stillbirth.

The incidence of still births was significantly higher in the group with severe placental pathology.

Discussion

As stated by Krause (1967), though the toxemic placenta is distinctly abnormal, there are no placental lesions which are specific to toxemia. Till date, a few inconstant reports have appeared in the literature on histopathology of placenta in toxemia of pregnancy.

As per Table I the incidence of severe placental pathology rose progressively with the rise in B.P. These findings corroborate well with those of Salvatore (1968) who demonstrated an increase in placental pathology as the degree of hypertension worsened. Bhatia *et al*, (1981), Kher and Zawar (1961) and Mehrotra *et al* (1972) too demonstrated similar findings.

The gross fetal outcome was also compromised by increasing placental pathology (Table IV). These findings are in agreement with those of Bhatia *et al* (1981) who correlated placental pathology with an increased incidence of fetal distress, low Apgar score and higher perinatal mortality.

From the cases analysed, it is seen that the placental pathology in hypertensive patients can be closely correlated with both the degree of hypertension and the ultimate fetal outcome. What is important is that the severity of placental changes and the fetal outcome appear to take a turn for the worse once the blood pressure crosses 150/100 mm Hg, a level much less than the conventional 160/110 mm Hg which is used to demarcate patients into the severely pre-eclamptic group.

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