

PROGNOSTIC SIGNIFICANCE OF PROTEINURIA IN HYPERTENSIVE PREGNANCY

By

APARNA SHROTRI AND SHARAD PATIL

SUMMARY

The perinatal-outcome was correlated with the degree of proteinuria, time of onset of disease and severity of hypertension in 234 pregnancies complicated by hypertension. The perinatal mortality was significantly higher in proteinuric hypertensives (33.3%) in comparison to non-proteinuric group (12.1%). Detection of hypertension prior to 37 weeks of pregnancy was associated with a very high PNM and considerable reduction in mean birth-weight of newborns, in comparison to patients developing the disease in late pregnancy. Early onset disease and proteinuria of 2 gm/L or more appeared to be the most important high risk factors in perinatal prognosis in hypertensive pregnancies while severity of hypertension alone did not have a significant adverse effect.

Introduction

Toxaemia of pregnancy is the second most common cause of perinatal deaths accounting for 10-15% of perinatal deaths. The syndrome generally beginning with hypertension progresses at an unpredictable rate with development of proteinuria. Proteinuria denoting greater severity and duration of disease has a considerable adverse effect on fetal health. Nonproteinuric hypertension on the other hand has got a less marked adverse effect on fetal health. The time of onset of disease also has been shown to have a profound effect on perinatal survival, the occurrence of disease prior to 37 weeks of pregnancy being of serious significance. It was decided to quantitate the perinatal risks

in pregnancies complicated by proteinuric hypertension and to study the effect of early onset disease on perinatal mortality.

Material and Methods

Two hundred and thirty four pregnant women exhibiting hypertension during pregnancy (BP 140/90 or more) were included in the study. Hypertension was graded as severe when systolic BP was 160 mm Hg or more and the diastolic BP was 110 mm Hg or more, the rest being classified as mild hypertension. The patients coming with convulsions and/or coma were not included. Thus, there were 153 women with mild hypertension and 81 women with severe hypertension. The degree of proteinuria and the time of onset of disease were noted. When the hypertension was detected prior to 37 weeks the disease was considered to be

'early onset' while when detected beyond 37 weeks of gestation it was considered as 'late onset'. All the patients were followed through delivery and first 7 days after delivery. All perinatal deaths were investigated. The incidence of preterm labour was noted and the birthweight of neonates was recorded. The perinatal mortality was correlated with degree of proteinuria, severity of hypertension and the time of onset of disease.

Observations and Results

The overall incidence of hypertension during pregnancy was 8.9% and excluding convulsive disorder it was 7.8% (234/3014). Nine women (6 mild and 3 severe hypertensive) had multifetal pregnancies and delivered twins. Thus, there were 243 births amongst 234 hypertensive women.

In all, 54.3% women were primigravidae. In proteinuric and nonproteinuric group the proportion of primigravidae was more or less similar (47% and 57% respectively).

Table I summarises the perinatal risks in pregnancies complicated by proteinuric hypertension.

Perinatal Mortality (PNM)

The PNM was significantly higher in proteinuric hypertensives (33.3%) when compared to nonproteinuric group (12.1%).

In severe nonproteinuric hypertension the PNM was significantly higher (23.1%) than in mild nonproteinuric group (8.9%) ($P = 0.02$).

In proteinuric patients the PNM was high irrespective of severity of hypertension and the difference between mild and severe hypertensives was not significant.

The proportion of preterm births (43.5%) and LBW infants (68.1%) was significantly higher in proteinuric patients in comparison to non-proteinuric ones ($P < 0.01$).

The PNM in relation to degree of proteinuria is shown in Table II.

TABLE I
Perinatal Risks in Pregnancies Complicated by Proteinuric Hypertension

Severity of hypertension	No. of births	Proteinuric Group				No. of births	Non-proteinuric Group			
		PND	PNM %	Preterm %	LBW %		PND	PNM %	Preterm %	LBW %
Mild	24	7	29.2	33.3	54.2	135	12	8.9	14.1	37.0
Severe	45	16	35.6	48.9	75.6	39	9	23.1	20.5	59.0
Total	69	23	33.3	43.5	68.1	174	21	12.1	15.5	41.9

TABLE II
Degree of Proteinuria, Severity of Hypertension and PNM

Proteinuria gm/L	No. of births	Mild		Severe		
		%	PNM%	No. of births	%	PNM%
Nil	135	84.9	8.9	39	46.4	23.1
0.5-2	17	10.7	23.5	20	23.8	20.0
> 2	7	4.4	42.8	25	29.8	48.0
Total	159	100.0	17.0	84	100.0	29.8

Proteinuria was present in only 15.1% of mild hypertensives in comparison to 53.6% of women with severe hypertension ($P < 0.2$).

The PNM was significantly increased with proteinuria of more than 2 gm/L ($P < 0.05$). There was no significant difference in PNM of nonproteinuric women and those showing proteinuria of 2 gm/L or less.

The PNM and mean birthweight of newborns in relation to time of onset of disease in proteinuric and nonproteinuric groups are given in Table III.

The severity of hypertension did not make a significant difference in PNM in both these groups.

The mean birthweight of newborns in early onset disease was significantly lower in both the groups when compared to that with late onset disease (1586 gms in proteinuric and 1963 gms in non-proteinuric group).

Mild non-proteinuric hypertension noted for the first time after 37 weeks of gestation is associated with lowest PNM

TABLE III

Mean Birthweight and Perinatal Mortality in Pregnancies Complicated by Early Onset Hypertension

Severity of hypertension	Proteinuric			Non-proteinuric		
	Early onset	Late on set	All	Early onset	Late on set	All
Mild						
Mean BW in gms.	1474	2511	2067	2025	2632	2550
PNM%	85.7	5.9	29.2	27.3	5.3	8.9
Severe						
Mean BW in gms.	1623	2357	2015	1850	2357	2214
PNM%	41.2	12.5	35.6	45.5	14.3	23.1
Total						
Mean BW in gms.	1586	2415	2033	1963	2576	2473
PNM%	67.9	10.0	33.8	35.5	7.2	12.4

The mean birthweight of proteinuric group was 2033 gms in comparison to 2473 gms in nonproteinuric group.

When proteinuric group was further split according to time of detection of disease, it was observed that the PNM was significantly higher in early onset disease (67.9%) in comparison to late onset disease (10%) ($P < 0.01$).

Nonproteinuric patients with early onset disease also had a considerably higher PNM (35.5%), however with added proteinuria it stepped up significantly ($P < 0.02$).

(5.5%) and a mean birthweight of 2632 gms which seems to be almost similar to that in uncomplicated low risk at term mothers in this Institution in whom the PNM was 3.1% and the mean birthweight of neonate was 2850 gms.

Discussion

Theobald (1958) stated that the PNM associated with hypertension and albuminuria is almost 3 times higher than with hypertension alone. Das (1968) have observed 34% PNM in proteinuric

group in comparison to 14% in nonproteinuric patients. Our results are similar to these reports.

Brown (1950) has stated that when blood pressure rises above 160/100 mm of Hg the spasm of glomerular arterioles causes albuminuria. Present study also confirms the significantly higher incidence of proteinuria in association with severe hypertension. However, about 15% of mild hypertensive women have also exhibited proteinuria.* Das (1968) and Theobald (1968) have also reported a similar finding.

It has been observed here that the PNM is high in proteinuric patients irrespective of severity of hypertension. This indicates that proteinuria rather than severity of hypertension seems to be the important factor in fetal prognosis. Proteinuria of more than 2 gm/L has significant adverse effect on fetal health. The lesser degrees of proteinuria do not affect the fetus much. Dickmann (1942) has reported that the daily excretion of less than 3 gm of protein in the urine can be continued for a period of weeks with no danger to fetal health provided the blood pressure remains 150 mm of Hg systolic.

In nonproteinuric hypertension, however, the severity of hypertension does affect the fetal prognosis adversely, the

PNM in mild nonproteinuric hypertensive patients being the lowest.

It is often stated that the earlier the onset of hypertension, the higher is the PNM. The present study shows a significantly higher PNM in hypertensive patients detected prior to 37 weeks of pregnancy. Long (1980) observed a higher incidence of fetal growth retardation in early onset pre-eclampsia (18.2%) than in late onset disease (5.6%). Present study also shows remarkably low mean birth weights of neonates in early onset disease.

Thus, proteinuria of 2 gm/L or more and early onset disease seem to be the most important high risk factors involved in perinatal prognosis in hypertensive pregnancies.

References

1. Browne, F. J.: Postgraduate Obstet. Gynec. London, 1950, Butterworths & Co. quoted by Das, S. K. (1968).
2. Das, S. K.: J. Obstet. Gynec. India, 18: 63. 1968.
3. Dickman, W. J.: The Toxemia of Pregnancy, 1st Edition, St. Louis, 1941, P. 465 quoted by Das, S. K. (1968).
4. Long, P. A.: Brit. J. Obstet. Gynec. 87: 13. 1980.
5. Theobald, G. W.: The pregnancy toxemias London, 1955, P. 176, quoted by Das, S. K. (1968).