

# RETINAL CHANGES IN PREGNANCY INDUCED HYPERTENSION

By

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## SUMMARY

Retinal changes were studied in 65 PIH patients (56 PET + 9 Eclampsia). Retinal changes were present in about one-fourth (24.6%) mothers, more in eclampsia than PET. The commonest finding was attenuation of retinal arterioles, next to it was increased arterial reflex. Retinal changes were more in teenage mothers and after 30 years of age, more in multipara than primi, more in proteinuric than non-proteinuric PIH. Earlier the onset of PIH, more involvement of retina. Earlier diagnosis and effective control of the hypertension can reduce the incidence of retinal changes.

### *Introduction*

Ophthalmoscopic examination of the optic fundi is an essential part of the examination of every hypertensive patient, as this is the only site in the body where the effects of high blood pressure on smaller blood vessels can be visualised and assessed. Obstetricians are becoming more aware of the valuable prognostic assistance that may receive from the ophthalmologist. Not infrequently there is disproportion between the severity of the clinical picture and severity of retinal picture. It is in these cases that the retinal study is most valuable.

### *Materials and Methods*

The cases for this study has been collected from the Antenatal Clinic and the In-patients Department of Eden Hospital, Medical College.

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Out of 65 cases of PIH—56 in pre-eclampsia group, 9 patients were in eclampsia group. All the cases of pre-eclampsia and eclampsia had hypertension at or above the level of diagnostic criteria. In 56 cases of pre-eclampsia group, the first trimester booking BP was known and it was found to be normal. In the 9 cases of eclampsia group, it was unknown as these patients were admitted through emergency as eclampsia.

### *Ophthalmoscopic examination*

Both pupils of PIH mothers were dilated by adding one drop of 10% phenylephrine HCl in each eye at 15 minutes interval for 4 times. Then they were examined by ophthalmoscope critically to find out any retinal change. This process was repeated at 7 days interval at antepartum and postpartum period till discharged or till the changes were present.

### *Observation and Analysis*

In this study, retinal changes were present in about one-fourth of PIH mothers

(24.6%—Table I) and this change was more in eclampsia than pre-eclampsia group. About one-third of eclamptic mothers had retinal changes in comparison to less than one-fourth of pre-eclampsia group (Table I).

Incidence of retinal changes in PIH depends on the age of the mother and duration of PIH. About 15% retinal changes were present in the age group of 21 to 25 years and 31% retinal changes from 26 to 30 years group. But it was 100% above

TABLE I  
*Distribution of Retinal Changes in PIH*

PIH	Total No.	Retinal changes	Percentage
Pre-eclampsia	56	13	23.2
Eclampsia	9	3	33.3
	65	16	24.6

Sixteen out of 65 PIH cases had some retinal changes. There were more than one change in one patient, as such Table II shows total number of changes 30. The usual arteriovenous (A-V) ratio is 2:3 or 3:4. But in attenuation, the AV ratio was found to be 1:2 to 1:4 with diminished caliber of arteriole. In this study, the commonest finding was attenuation of retinal arterioles, next to it was increased arterial reflex.

TABLE II  
*Retinal Changes in Present Series (16 Cases)*

Types of Retinal changes	No.
Attenuation of retinal arterioles	11
Increased arterial reflex	8
Nicking at AV crossing	5
Irregularity in arteriolar caliber	3
Straightening of vessels	2
Retinal Detachment	1

30 years age (Table III). In the latter group the number of mothers were two, both having retinal changes. Had it been in large number the exact percentage could have been worked out. It has been observed in Table III that the incidence of retinal changes were more (25%) in the teenage group because they were the frequent defaulters of ANC.

It was observed that higher the parity, higher the involvement of retinal vessels among PIH mothers. It was only 17% in nullipara, but 35.7% among parity one or two and 100% involvement among the parity above two (Table IV). Retinal changes were more in severe hypertensive group than in mild group. Moreover, diastolic severity affected the retina more than systolic severity (Table V). But the degree of hypertension did not run parallel to increased retinal changes. There was mother

TABLE III  
*Retinal Changes in Relation to Age*

Age with retinal changes	Total No	Retinal changes	Percentage
<21 years	20	5	25
21 - 25 years	27	4	14.8
26 - 30 years	16	5	31.2
31 - 35 years	2	2	100

TABLE IV  
*Relationship Between Retinal Changes and Parity*

Parity	Total No.	Retinal changes	Percentage
0 (Nullipara)	48	8	17
1 - 2	14	5	35.7
>2	3	3	100

TABLE V  
*Degree of Hypertension with Retinal Changes*

Level of Blood Pressure (mm of Hg.)	Total No.	Retinal changes	Percentage
Mild ( $\geq 140$ but $< 160$ )	42	9	21.4
Systolic Severe ( $\geq 160$ )	23	7	30.4
Mild ( $\geq 90$ but $< 110$ )	41	6	14.6
Diastolic Severe ( $\geq 110$ )	24	10	41.7

whose blood pressure was 210/144 mm of Hg without retinal involvement whereas PIH mother with 140/100 mm of Hg had retinal changes.

Retinal changes were more in proteinuric mothers (37%) than in non-proteinuric PIH (Table VI). It was seen in 25% of PIH mothers with oedema and in 17% of

PIH mothers without oedema (Table VII).

Earlier the onset of PIH, more involvement of the retina. Those mothers who developed PIH at or after 37 weeks of gestation, did not show retinal changes. The unbooked PIH mothers were more prone to develop eclampsia and retinal changes due to failure to control the pathology and prolongation of PIH (Table VIII).

TABLE VI  
*Proteinuria with Retinal Changes*

Proteinuria	Total No.	Retinal changes	Percentage
Present	19	7	37
Absent	46	9	19.5

TABLE VII  
*Retinal Involvement in Toxaemic Oedema*

Oedema	Total No.	Retinal changes	Percentage
Present	59	15	25.4
Absent	6	1	17

TABLE VIII  
Retinal Changes in Relation to Detection of PIH

Detection of PIH (at weeks)	Total No.	Retinal changes	Percentage
<29	8	3	37.5
	12	4	33.3
33 - 36	23	6	26.0
37 - 40	13	0	0
Eclampsia (unbooked)	9	3	33.3

### Discussion

Schultz and O'Brien (1938) studied 47 toxæmic patients and found retinal changes in 81%. Hallum (1936) found retinal changes in 62.1% cases of PET and in 95.2% cases of eclampsia. In present series, retinal changes are found in 23.2% cases of PET and 33.3% cases of eclampsia. This wide difference is probably due to age and parity distribution of series. Schultz and O'Brien (1938) studied 47 cases from 17 to 45 years of age of which 12 were above 35 years old and 34% of PIH mothers are primipara. Hallum (1936) in his study of 300 cases of toxæmia of pregnancy, the average age incidence was 30.2 years with previous toxæmia and 24.2 years without previous hypertension and the parity distribution is between 1 to 12. In the present series of 65 cases, only two mothers are above 30 years and none is above 35 years age and primis comprise 74%. Both low age and increased primipara of present series may be the cause of lower incidence of retinal changes in present series.

The retinal changes are liable to occur when the systolic pressure rises above 160 and the diastolic above 100 mm Hg and are marked when these limits reach 200/130 mm of Hg. In general the retinal changes run parallel with the severity of hypertension and therefore of toxæmia

(Duke-Elder, 1967). Shukla and Prasad (1976) identified retinal changes with degree of blood pressure as follows:—upto 150/100 mm of Hg, retinal changes present in 5% cases but it is 65% when pressure is above 150/100 mm of Hg. In present series when the systolic pressure is at or above 160 mm of Hg retinal changes occur in 30.4% in contrast to 21.4% cases when systolic is below 160 mm Hg. Again in considering diastolic pressure, retinal changes occur in 41.7% with pressure at or above 110 mm of Hg but when it is below 110, retinal involvement is in 14.6% cases.

Shukla and Prasad (1976) have shown that 30% patient with mild proteinuria had no retinal changes and the rest 70% patients had varying degree of proteinuria with retinal changes, 30% patients with mild to moderate degree of oedema without retinal changes and 70% PIH mothers with moderate to severe oedema had retinal changes. In present series 37% of total proteinuric mothers and 25.4% of PIH mothers with varying degree of oedema have retinal changes.

Longer the duration of toxæmia, greater the incidence of vascular damage. The average duration of toxæmic process (uncontrolled by medical treatment) in the group that ultimately showed retinal changes was 6.2 weeks (Gibberd, Peckham, Chesley—as quoted by Finnerty, 1954). In present

series, 48 mothers of PET group develop toxæmia in third trimester of which 10 show retinal involvement. Eight mothers develop PIH in second trimester. All of them should have retinal changes in later part of third trimester, but only 3 mothers involved. Others escaped—may be due to early hospitalisation and medical treatment prevent retinal involvement.

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