

RETINAL CHANGES IN PRE-ECLAMPSIA

(A Study of 200 Cases)

by

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Pre-eclampsia is one of the commonest problems encountered in obstetrics in the last trimester of pregnancy, more commonly in primigravida, characterised by hypertension, edema and proteinuria. The various pathological changes in different organs of body can be studied by directly visualising the ocular fundus and it may give a true index of changes in vascular system of brain and kidney.

The retinal changes described in cases of pre-eclampsia are spasm and narrowing of arterioles, edema of retina, haemorrhages, exudates, papilledema and detachment of retina (Duke Elder and Dobree, 1967). Only few reports are available on this subject in Indian literature (Francis, 1959; Siva Reddy, 1959; Kishore and Tandon, 1965 and Shukla and Prasad, 1976). In view of the paucity of reports from India, the authors report the results of their study on retinal changes in 200 cases of pre-eclampsia.

Materials and Methods

Two hundred consecutive cases of pre-eclampsia admitted in the Maternity ward of Government General Hospital, Kakinada, in a period of 2 years from January 1979 to December, 1980, were examined for retinal changes. Age, gravida, period of gestation, blood pressure, edema, and albuminuria were noted. The severity of pre-eclampsia was graded into mild and severe as per the criteria of Hellman and Pritchard (1971). Fundus examination was done with direct ophthalmoscope after dilating the pupils with 10% drosyn (Phenylephrine) drops. Any visual symptoms, if present, were noted.

Observations

The patients in the present study were aged between 15 and 40 years, with maximum number (51%) in the age group of 15-20 years. One hundred and ten patients were primis, 80 were multies and 10 were grand multies. Some of the latter two groups patients gave history of pre-eclampsia in the previous pregnancies. All the patients were in the last trimester of pregnancy and they were followed up to perpuerium.

Out of 200 patients examined, 108

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(54%) showed one or more changes in the fundus of one or both eyes. Eighty-four out of 120 mild pre-eclampsia cases and 8 out of 80 severe cases (total 46%) had normal appearance of fundus in both eyes. Various retinal changes observed in the present study are shown in Table

I. As some of the patients showed more than one change in the fundus the total number of retinal changes shown in the Table will be more than the total number of patients. The relationship of retinal changes with various clinical parameters is shown in Table II.

TABLE I
Retinal Changes in Pre-eclampsia

Type of retinal change	Mild (120)		Severe (80)		Both together (200)	
	No. of cases	Percentage	No. of cases	Percentage	No. of cases	Percentage
Spasm of arterioles	11	9.2	14	17.5	25	12.5
Narrowing of arterioles	22	18.3	63	78.75	85	42.5
Sclerosis of arterioles	2	1.66	5	6.25	7	3.5
Edema of retina	8	6.6	38	47.5	46	23.0
Haemorrhages	—	—	6	7.5	6	3.0
Exudates	—	—	6	7.5	6	3.0
Macular edema	—	—	7	8.75	7	3.5
Brownish red spot in macula	—	—	2	2.5	2	1.0
Blurring of disc margins	—	—	1	1.25	1	0.5
Pallor of optic disc.	3	2.5	12	15.0	15	7.5

TABLE II
Relationship of Retinal Changes With Age, Gravida, Period of Gestation and Severity of Pre-eclampsia

Clinical parameter	Total No. of cases	No. of cases showing fundus changes	Percentage
Age in Years			
15-25	147	78	53.0
26-40	53	30	56.6
Gravida			
Primi	110	60	54.6
Multi	90	48	53.3
Period of gestation in weeks			
32-36	131	79	60.3
37-40	69	29	42.0
Severity of pre-eclampsia			
Mild	120	36	30.0
Severe	80	72	90.0

Discussion

In the present study retinal changes were observed more frequently in severe cases (90%) of pre-eclampsia than in mild cases (30%). Similar incidence has been reported by Francis (1959) 57.1% in severe cases and 25% in mild cases.

Spasm and narrowing of retinal arterioles was the most common and earliest sign observed in the present study, as stated earlier by Wagener (1933). Spasm was associated with narrowing of arterioles in 10 cases. In 2 cases of severe pre-eclampsia there was marked spasm of all the branches of retinal arterioles giving the appearance of pallor of the disc, retina and a brownish red spot in macular area, simulating central retinal artery occlusion. With the institution of retrobulbar injection of 1 cc of duvadilan (Isoxsuprin) in both eyes followed by injection duvadilan 1 cc I.M. Bd., along with the standard line of treatment for severe pre-eclampsia, the spasm of retinal arterioles disappeared completely in 48 hours without any visual impairment in both patients. Focal narrowing in one or other branches of arterioles was seen in 15 cases and it was around the optic disc in all the patients. In 25 patients, narrowing of arterioles was present in nasal branches only.

Retinal edema usually makes its appearance at the upper and lower poles of the disc and progresses away from the disc along the course of nerve fibres. In earlier stages of edema of retina, the portion involved appears milky and on close examination with the very best focus of the ophthalmoscope, its surface shows faint striations running in the direction of nerve fibre layers (Hellman and Pritchard, 1971). In this study retinal edema alone was seen in 8 cases of mild pre-eclampsia without any other change in the

fundus. In the rest of the cases there was associated spasm or narrowing of arterioles.

Corwin (1927) was of the opinion that the earliest change in the fundus was retinal edema and it often precedes spasticity, retinal exudates and haemorrhages. Finnerty (1954) has described a retinal sheen, probably attributable to retinal edema, which he states is specific of pre-eclampsia and is often an early sign. He differentiates pre-eclampsia from hypertensive disease on this basis.

In the present study, the macula was involved in 7 cases with marked retinal edema resulting in diminution of vision ranging from 6/9 to 6/18. In one of these cases, the retinal edema was so severe that the disc margins were not clearly visible in the upper and lower poles. There was associated narrowing of arterioles in 3 cases; haemorrhages, exudates and narrowing of arterioles in another 3 cases. All the patients were suffering from severe pre-eclampsia and they were near full term. Basing on the ophthalmological findings, termination of pregnancy was advised in them and after the delivery oral corticosteroid therapy was started for the absorption of macular edema. All the patients regained normal vision in both eyes in a period of 7-10 days.

Arteriolar sclerosis was seen near the optic disc before the first arteriovenous crossing. This was observed in multigravida who gave history of pre-eclampsia in previous pregnancies, thus indicating the possibility of previous hypertension with super added pre-eclampsia.

Haemorrhages were small, flame shaped (superficial type), seen along the blood vessels, mostly in the central part of the fundus. Exudates were often multiple, cotton wool patches (soft exudates), seen

in any part of the fundus. Both were observed in severe cases of pre-eclampsia. Wagener (1933) and Mussey and Mundell (1936) have also reported exudates and haemorrhages associated with toxæmia.

In all the cases, pallor of the optic disc was due to spasm/narrowing of arterioles. Depending on the severity of arteriolar changes, diffuse pallor of the disc or pallor on the nasal or temporal side of the disc was observed. Diffuse pallor of the whole retina and disc due to associated gross anaemia was not included in this study. All the retinal changes disappeared completely in a period of 10 to 14 days after the delivery and control of pre-eclampsia.

Francis (1959), Siva Reddy (1959), Kishore and Tandon (1965) and Shukla and Prasad (1976) from our country have also reported all the above retinal changes in cases of pre-eclampsia and eclampsia, but the incidence in their reports is lower than the present series.

Permanent blindness due to spasm of retinal arterioles, marked edema of retina and disc, and small retinal detachment (Somerville-Large, 1950); blindness due to central retinal artery occlusion (Carpenter *et al.*, 1953); temporary blindness due to spasm of retinal arterioles and marked retinal edema (Gandhi *et al.*, 1978); acute ischemic optic neuropathy (Beck *et al.*, 1980) and retinal detachment (Reddy and Veeraraghavamma 1981), in isolated cases of pre-eclampsia have been reported in the literature. Although the visual disturbances are thought by some to be of central origin, they are more likely attributable to pathological changes in the retina (Hellman and Pritchard, 1971).

There was no significant difference in

the incidence of retinal changes age-wise or gravida-wise, but they were more frequently seen in patients with early onset of pre-eclampsia and also in severe cases of pre-eclampsia (Table II). It may be concluded from this study that the higher the blood pressure, the greater are the changes in the retinal arterioles and the same observation has been reported by Francis (1959) and Kishore and Tandon (1965).

The changes in the retinal arterioles will indicate the similar status of the arterioles in the placenta. The presence of haemorrhages in the retina may indicate the possibility of similar haemorrhages in placenta. Thus the visualisation of retinal circulation may give a reasonable status of placental circulations and indirectly the well-being of the foetus. The presence of exudates in the retina (albuminuric retinitis) will indicate the possibility of damage to the kidney in the disease process. So, by repeated fundus examination at regular intervals in pre-eclampsia, one can assess the severity and progression of the disease by the extent of retinal changes, and know whether the patient is responding well to the treatment instituted, or not. The absence of retinal changes would allow one to take a more conservative line of treatment, whereas sudden diminution of vision associated with progressive spasm of retinal arterioles or retinal edema, onset of macular edema or papilloedema or detachment of retina are the warning signs for termination of pregnancy to save the vision and also to prevent further pathological changes in the arterioles of other organs in the body.

Summary and Conclusions

Out of 200 cases of pre-eclampsia examined for retinal changes, 54% show-

ed one or more changes in the fundus. The most common change observed was spasm/narrowing of retinal arterioles. Macular edema associated with other changes was seen in 7 patients who required termination of pregnancy. There was no significant correlation between the retinal changes and age or gravida of patient. But the incidence of retinal changes was significantly correlated with the early onset of pre-eclampsia and also with the severity of pre-eclampsia.

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