

FUNDOSCOPY IN TOXAEMIAS OF PREGNANCY

by

CHANDRAKANT R. JOSHI, M.D., D.G.O., D.O.M.S.,

Malad, Bombay.

Toxaemia of pregnancy is a vague term applied to a group of conditions—call it a syndrome whose aetiology is still obscure—during the period of gestation usually in the third trimester represented by:

(a) Rise of blood pressure, (b) increase in weight, (c) oedema, (d) albuminuria, (e) retinal changes, (f) in its mild or moderate form any one or all these changes may be present and if unchecked, it may culminate in that dangerous condition of eclampsia threatening the life of the mother and the child.

The importance of first four of the above changes is well recognised all over the world and in all modern antenatal clinics forms a part of routine regular investigations. I feel that retinoscopy, though very important, has not received its due place in this routine check up except in very few clinics where ophthalmologist is very easily available and that too in only few advanced cases. An average ophthalmologist, who has not taken special pains to study the details and importance of very early changes which are more important in corroborating the obstetric changes, usually only expects and looks for those extremely rare appearances

Paper read at the 10th All India Obstetric & Gynaecological Congress at Hyderabad in January 1959.

of haemorrhages and exudates and in their absence declares with confidence that nothing abnormal is detected. These haemorrhages and exudates should never be allowed to develop, as they represent very advanced degree of toxaemia and danger of impending death. This, I think, has slackened the obstetrician's interest in the ophthalmological findings and thus, though very important, this subject has remained neglected and receives a step-motherly treatment.

As luck would have it, I came across three such advanced cases of retinal changes and advised immediate termination of pregnancy. Unfortunately, the advice was neglected and I cannot forget the disastrous results that followed—one patient died, another developed hemiplegia after severe eclampsia and the third was saved from eclampsia after elaborate treatment. This stimulated me to pick up this subject for further studies and it is my aim to devote my energies to finally explore and establish the exact importance of retinoscopy in research and study of toxaemia.

Eye is the only window in the body which gives us a direct vision of the various states of arterioles, veins, capillaries, retinal nerves and meninges. Let us correlate the

changes taking place in the body during toxæmia to the changes occurring in the retina logically. Normal retina consists, as we see through an ophthalmoscope which magnifies the image about fifteen times, of the following structures:

- (I) The bright pink retinal tissue—the colour being due to the blood film in capillaries.
- (II) The optic disc representing the head of the optic nerve. It carries along with it the meningeal sheaths from brain.
- (III) The central retinal artery along with the vein arising from the centre of the optic disc and immediately dividing into four, superior and inferior, nasal and temporal branches.
- (IV) The macula or yellow pearl-like structure which is apparently avascular and which is responsible for acuity of vision.

This will suffice for our purposes.

The same toxin and phenomenon which give rise to oedema of the body can give rise to oedema of the retina which first becomes paler and then swollen.

Similarly, rise in blood pressure is represented by various changes in blood vessels which I shall presently describe.

Just as albuminuria represents damage to capillaries and epithelium of kidneys, exudates and white patches represent damage to retinal capillaries.

Higher blood pressures cause hæmorrhages at other sites, like

placenta; similar hæmorrhages can be seen in the retina.

Increase in the cerebral tension which is a very palatable and probable explanation of convulsions in eclampsia and which is proved by finding wet brain so commonly found at autopsy of eclamptic patients is pictured on the retinal screen by swelling of the nerve head which carries the nerve sheaths along with it and is termed papilloedema.

Retina being a part and parcel of the body is affected not only in toxæmias of pregnancy but all the conditions affecting any of the above systems. Thus so many other systemic diseases like hypertension, renal conditions, diabetes, tuberculosis, purpuras, leukaemias, pernicious and hæmorrhagic anaemias, etc., cast their shadows on the retina.

I shall now proceed to describe the sequence of changes occurring in the retina as the toxæmia advances from mild to severe form.

(1) The earliest and the most important change is a constriction and narrowing of the arterioles which according to Wagenor may affect any or all the branches of the central artery.

(2) The usual arteriovenous ratio of 2:3 is diminished, e.g. 1:2. According to Master it is present in all the cases of pre-eclamptic toxæmia where blood pressure is above 150 mm. Hg systolic and 100 mm. Hg diastolic.

(3) The narrowing is often accompanied or followed by irregular contractions of the lumen of arterioles preferably in smaller nasal branches at first and it varies in degree and location from day to day.

(4) Later the constriction becomes fixed.

(5) Grace Jones believes that apart from spasm of arterioles, slight swelling of the disc is the first stage to be observed. The disc is swollen, has indistinct margins and is most often reddened. This swelling is due to oedema and is accompanied by swelling of the adjacent part of the retina. The fundus thus looks streamy or hazy.

If the disease is still unchecked, the following more advanced stages appear which must not be allowed to develop if the interests of the mother and the foetus are to be looked after. These are signs of imminent eclampsia and death.

(6) There is frank papilloedema representing raised intracranial tension.

(7) Finally cotton wool patches and haemorrhages which signify albuminuric retinitis appear.

(8) Ultimately, the detachment of retina from accumulation of sub-retinal fluid in severe oedema is a very rare complication.

In spite of these changes, if pregnancy is terminated in time, I think, as is also stated by Doggart and Hallum, the prognosis may change its gravity, the retina becomes re-attached in a month or less. All the other changes also gradually regress. Of all the exudative and haemorrhagic changes, the pregnancy changes are the only ones on the retina which are completely reversible probably because placental toxins always disappear at the termination of pregnancy before the irreversible fibrous tissue etc. form—if the patient survives.

The main reason for neglecting these definitely progressive and specific changes in the retina is that in spite of such signs of advanced retinitis, the subjective signs are very few and more often absent unless the region of macula is affected.

The common symptoms are:

- (1) Spots in front of the eyes.
- (2) Flashes of light.
- (3) Dimness of vision.
- (4) Distortion of images.
- (5) Discomfort but rarely pain.

Role of Retinoscopy

I believe that fundoscopy can play a very prominent role in toxæmia of pregnancy for the following reasons:

(A) *Diagnosis:* Institutions which are not taking routine antenatal care sometimes send the cases to the ophthalmic specialist for any of the above mentioned conditions and he may be the first to detect the toxæmic state of pregnancy and its gravity. In the present state of our retinal knowledge it must be admitted that other symptoms of toxæmia, e.g. increase in weight, rise in B.P. or oedema, are much earlier signs. May be, one day we may be able to detect the earliest sign in the retina itself.

(B) *Prognosis:* Severity of toxæmia can be assessed by the extent of retinal changes and a reasonably accurate prognosis can be predicted. Prognosis also will depend upon the adequate care and treatment of the patient.

(C) *Progress:* By repeated examinations, we can make out whether the patient is going from bad to worse or vice versa.

(D) If routine retinoscopy is carried out at 3rd month, 6th month, 9th month and 1 month after delivery, it may be possible to distinguish it from essential hypertension, malignant hypertension, chronic nephritis, etc.

(E) It is possible to judge the effect of various lines of treatment. Thus we can see whether lumen of the arterioles is improving, say with hypotensive drugs or papilloedema is disappearing indicating lowered tension in vessels and brain. It may be possible to correlate the effectivity of the drugs, improvement in symptoms and retinal changes.

(F) It may be possible to advise a line of approach in a given case. Thus if hypertensive changes are predominating sedatives must be combined with hypotensives and, if oedema is dominant, more emphasis

may be laid on that approach, e.g. salt restriction, fluid restriction, diuretics, hypertonic infusions, etc. In cases showing gross retinal changes immediate termination of pregnancy by safest route may be advised. It is the limit of conservative approach.

(G) Toxaemia is a disease of theories. No theory has yet successfully been able to explain its various and varied aspects. Retina may open our eyes one day to the real aetiology of the disease and it is well known that a disease known is half cured.

I am very thankful to Dr. B. N. Purandare for his guidance and encouragement and Dr. Masani for permitting me to work at Wadia Hospital.

I request you to offer your comments and guidance.