Tangential displacement of the iris pattern is a common finding in chronic glaucoma and may occur in the early stages. It was found to be present in fourteen members of a series of thirty-five consecutive cases of chronic glaucoma. Although it is almost certainly a stage in the iris atrophy which occurs in the advanced condition, tabular evidence is presented which shows that it may be found in conjunction with good central vision. It is a sign subordinate to the findings of the tonometer and screen and certainly visual acuity is no index of the progressive severity of the disease. As inspection is usually carried out, however, before instrumental methods, the observation has a place in routine work. The serious nature of the eye condition may be suspected immediately if tangential displacement of the iris pattern is observed.

TEMPORARY CATARACTS IN DIABETES*

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THE very transient lens opacities that occur in intense dehydration of diabetic coma and last 1 or 2 days were recently described by Lawrence, Oakley and Barne (1942). Apart from such acute dehydration a few cases of longer lasting but temporary cataracts have been recorded. Nettleship (1885) described three patients in whom cataracts rapidly developed as diabetes grew worse and cleared when the treatment either abolished or diminished the urinary sugar. In one case "symmetrical nuclear cataracts," which prevented recognition of large objects, disappeared completely in two weeks and small print could be read again—this by diet and opium treatment which diminished the urinary sugar from extremely high to moderate amounts. The cases are not described in great detail and the metabolic details are scanty, but the facts are authentic and clear. Alt (1906) describes the eye changes in a young woman with neglected and progressively severe diabetes. One morning while reading at 11 a.m. she was terrified by a sudden clouding of her right and later the left eye and at 5 p.m. Alt observed a large subcapsular opacity in the R. eye and radial streaks in the left. The strenuous diet she then submitted to reduced her sugar and in three weeks both lenses were quite clear

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and opacities never recurred although she died in coma 14 months later (I should mention that this author describes a temporary cataract as occurring in a phase of renal oedema). The fifth case is published by Braun (1935) who describes an emmetropic boy, aged 19 years, who developed defective vision fairly suddenly it seems before any treatment. After six days of insulin treatment Braun was asked to examine the eyes, found bilateral posterior rosette cataracts and saw them disappear completely in a further 10 days of insulin control. A sixth case of diabetic cataract is recorded by Fischer (1925) as improving under insulin, but the details are very scanty.

I had never noticed such phenomena until this year when in the following two cases cataracts both developed and cleared up while under treatment and fairly accurate observation.

CASE 1.—H.W., a thin male, age 39 years, came under treatment two months after the acute onset of diabetic symptoms. He had been myopic for years (-3 D.) but noticed no visual changes with the onset and development of diabetes. On diagnosis the diabetes was severe—intense thirst, night polyuria 5 pints, blood-sugar 416 mg. per 100 m.l., but no ketosis. He was immediately treated with insulin, responded easily and left hospital after 12 days with normal blood-sugar tests, on 200 grams C., and 12 units of protamine zinc plus 12 units soluble insulin. On the 4th day of treatment and of being sugar-free he complained of blurred vision and could see better without his glasses, obviously the usual temporary hypermetropia so common during “desugarisation.” Both lenses were *clear* before treatment and remained so throughout this period and by the 12th day of insulin his usual visual focus and acuity were re-established as commonly occurs.

I saw and tested him three weeks later and found him in perfect diabetic control with a gain of 10 lbs. in weight. He complained that four days after leaving hospital, *i.e.*, 16 days of treatment, his vision got worse and that he noticed he could see better in a dull light. I vaguely expected this to be due merely to further refractive changes but was horrified to find the opacities depicted in Fig. 1, the rosette cataract in the right eye actually reaching the centre of the lens and obscuring the macula. As this finding was quite new in my experience with thousands of diabetic eyes, I did and said

FIG. 1.

nothing, fully expecting the opacities to be permanent if not progressive.

I did not see him until nine months later when I found both lenses entirely clear. This intelligent man gave the clear statement that within four days of my seeing the cataracts his vision underwent a sudden change in one day and became clear and normal, *i.e.*, three weeks' duration.

No slit-lamp examination was made so I am uncertain where exactly these opacities were situated. It is certain, however, that these changes came on and went suddenly over a period of three weeks, during which his sugar metabolism, though recently stabilised, was quite stable.

CASE 2.—W.B., an obese male, age 45 years, was seen at King's College Hospital only two weeks after acute symptoms of diabetes had developed: urine sugar 4 per cent., no ketosis, blood-sugar 380 mg. per 100 m.l. No change in vision, but he was a life-long myope (-7 D.). His lenses were quite clear. He was put on a diet of 120 grams C. without insulin. After *three days' diet* he first noticed misty vision and as this got worse he was sent to Croydon General Hospital where Mr. T. E. Davies, D.O.M.S., observed two central lens opacities and prescribed "Calcium Sodium Iodide ointment and drops." I re-tested his diabetes after *fifteen days of diet* and found the urine nearly sugar-free, the blood-sugar 200 mg. per 100 m.l., and saw the two central and ? posterior rosette cataracts. Further examination in four weeks (45 days' diet) showed a sugar-free urine, blood-sugar 140 mg. per 100 m.l. and perfectly clear lenses. Fortunately the patient works for an optical company and his employer, Mr. F. S. B. Ellis, D.B.O.A., has kindly furnished detailed information of the lens changes in this interval. No further noticeable change was found

FIG. 2.

until about the 28th day of diet. Then the right eye improved, the cataract lessened and, clearing in an outward and upward direction (see Fig. 2) completely disappeared in eight days. Then the left eye followed suit and cleared in another five days, again disappearing in an outward and upward direction.

The ultimate refraction and myopia are the same as before the diabetes.

Discussion

These two cases have much in common. Both were myopes but with otherwise normal eyes when first seen for diabetes. Both had quite high blood-sugar, but no ketosis and no signs of body dehydration although a minor degree is likely in diabetics with intense thirst, as they had. Both developed cataracts at a stage of much improved diabetes when the most likely humoral change in the eye might be presumed to be rehydration. In the first the cataracts appeared to commence about the 16th day of insulin treatment and lasted three weeks. In the second they seemed to begin about the third day of diet and lasted four to five weeks. Both were similar in their dark rosette appearance and in occupying the central and upper quadrant of the lens. Whether this position has any significance I do not know. The process seems quite different from the very common transient myopia and hypermetropias which occur respectively at the acute onset and subsequent control of the diabetes and last usually a few days to two weeks, for during even intense refractive changes the media remain quite clear.

My two cases seem to be the first in which cataracts were observed both to form and clear up in a previously normal lens. The other six cases were first observed when cataracts had already appeared, more or less quickly, in untreated diabetes and they disappeared when the sugar improved (not much by modern standards) by diet, four cases, and insulin, two cases.

In my cases on the other hand cataracts developed only during the *improvement stage* of treatment—indeed in the first case when full humoral normality may be presumed for some ten days. The duration of all these temporary cataracts seems to have been much the same, some two to four weeks.

I have insufficient knowledge (has any one?) of the physico-chemistry of the lens to venture on speculation on the causal mechanisms involved in the above phenomena. But as these cataracts can be brought on both by bad diabetes and by its treatment, the only common causal factor this suggests to me is *change in hydration*, both dehydration in progressively increasing diabetes and rehydration under treatment.

Summary

The development and disappearance of temporary cataracts in two diabetics under treatment is described.

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