Adult Vitelliform Macular Dystrophy

R. BRECHER and A. C. BIRD

London

Summary

Adult vitelliform macular dystrophy was first described by Gass as giving rise to bilateral, round or oval, yellow, symmetrical, subretinal lesions typically one-third to one-half disc diameter in size. Although Gass proposed that this was an autosomal dominant disease, doubt has been expressed as to whether or not it is heritable. We investigated the families of 12 patients who presented to our clinic with foveal lesions typical of adult vitelliform macular dystrophy and found familial involvement compatible with an autosomal dominant inheritance in ten, although it has not been conclusively proven in all families. In the remaining two patients, no familial involvement was detected, but in neither family were both parents available for examination so that autosomal dominant inheritance could not be ruled out. Over half (14/25) the patients with abnormal fundi were asymptomatic, and most had good visual acuity. However, two had visual acuities of less than 6/18 in both eyes. We conclude that adult vitelliform macular dystrophy is an autosomal dominant disorder, and the term would be best reserved for foveal lesions similar to that described by Gass with a dominant pattern of inheritance.

Adult vitelliform macular dystrophy was first described by Gass¹ in 1974 as a peculiar foveo-macular dystrophy. It is characterised by a focal, round or oval shaped, subretinal yellowish foveal lesion, often with one or more pigmented spots on the anterior surface at the level of the retinal pigment epithelium. The lesions may vary in size but are typically one-third to one-half a disc diameter, and are usually bilateral and symmetrical. Patients usually present in the fourth or fifth decade of life and tend to have minimal visual symptoms or mild metamorphopsia. The yellow material tends to fade over the years and choroidal neovascularisation has been reported as a rare occurrence in late disease. Fluorescein angiography reveals a characteristic ring of hyperfluorescence surrounding an area of hypofluorescence, corresponding to the

yellow subretinal lesion. The light induced rise in the ocular potential is normal or moderately reduced.

The disorder differs from Best's disease in that the foveal lesions are smaller in diameter, it presents at a later age, does not demonstrate evolutionary changes of the foveal lesion and the light induced rise in ocular potential is rarely absent.

The initial description stated that the disorder was probably inherited in an autosomal dominant fashion.¹ Since the original report, there has been conflict as to whether or not this entity exists, and if it is genetically determined.²⁻⁸ One group² investigated 33 patients with a similar appearing lesion and although showing familial involvement in only four suggested autosomal dominant transmission. Another group³ found no evidence of familial

involvement in their series, and thought that this entity should be considered a degeneration rather than a dystrophy. Most recently, a survey of patients with adult vitelliform macular dystrophy found no evidence of familial involvement by family history alone.⁵ Evidence of familial involvement is derived from one dominant pedigree of 23 members of one family with a macular dystrophy resembling that described by Gass.⁹

In an attempt to resolve these issues we undertook to examine relatives of patients presenting with typical foveal lesions in order to document whether or not an inheritance pattern exists, to determine the visual prognosis, and to identify the morphological variations of the disease.

Patients and Methods

Seventeen patients were seen at the Retinal Diagnostic Department of Moorfields Eye Hospital from July 1988 to April 1989 with bilateral central yellow subfoveal macular lesions typical of those described by Gass. Patients with archetypal lesions were asked to arrange for as many family members as possible to be examined at our clinic, regardless of any known eye problems. Five patients had no family available for examination; two had no living first degree relatives, and three had no family living in this country. A medical and

visual history as well as a thorough family history of eye problems were recorded. All patients and their relatives were tested for best corrected visual acuity and had anterior segment and fundus examination, stereoscopic colour fundus photography and fluorescein angiography. Additionally, all probands and some family members had electro-oculograms performed as described by Arden and co-workers.¹⁰ Some family members were unable to attend our clinic, and an attempt was made to contact a local ophthalmologist for details of an ophthalmological examination.

Results

From two probands a family history of visual loss was obtained; in both it was shown by family survey that the loss was due to macular disease typical of adult vitelliform dystrophy. In 10 of the 12 pedigrees evidence of familial disease was identified, and in nine the pattern of transmission appeared to be autosomal dominant. In the last family, two siblings had typical lesions but neither parents nor offspring were available for examination. No affected relatives were found in two cases; in neither were both parents or a large number of first degree relatives available for examination.

In both families where both parents were available for examination, one parent was identified as having adult vitelliform macular dystrophy. Of the 40 family members examined who were first degree relatives of the proband, 13 had abnormal fundi. If patients under the age of 20 years were excluded, 13 of 29 were affected.

Of the 25 patients examined with abnormal maculae, 18 showed typical foveal lesions, but some variation in the appearance of the lesions was seen. (Figs. 1–4). Two patients previously known to have typical foveal lesions had secondary changes (one atrophic at 60 years of age and one neovascular at 70 years of age), and the remaining five showed evidence of pigmentary changes in the central macula.

Fourteen of 25 (56%) patients with abnormal fundi were asymptomatic, including six of the 12 probands. Two patients, both over the age of 60 years had a visual acuity of

Fig. 1. Pedigree of patients whose fundi are illustrated in Figs. 2–4.

Fig. 2a.

Fig. 2b.

Fig. 2c.

Fig. 2d.

Fig. 2. Proband was a 40 year old female who had metamorphopsia with the right eye. Visual acuity was 6/18 in the right eye and 6/9 in the left. In each eye there was accumulation of white material at the level of the retinal pigment epithelium, and on fluorescein angiography the lesions showed marginal hyperfluorescence, and central hypofluorescence. (2a-d).

less than 6/12 in both eyes, (see Fig. 3) and six patients had a visual acuity of less than 6/12 in only one eye. (Table)

Electro-oculograms were performed on 21 patients with abnormal fundi. Four patients had a light induced rise in ocular potential of less than 180% in at least one eye.

Discussion

The results are compatible with all the patients presenting with typical lesions of adult vitelliform dystrophy having autosomal dominant disease, although in certain families the inheritance was not proven. In the two families where both parents were available for

Fig. 3a.

Fig. 3b.

Fig. 3c.

Fig. 3d.

Fig. 3. The mother of the proband was 68 years of age, and her visual acuity was 6/60 in the right eye and 6/36 in the left. At each fovea there was well defined atrophy of the retinal pigment epithelium and inner choroid. (3a-d).

examination, one parent was found to have the disorder in each family. Of those patients at 50% risk of inheriting the abnormal gene, and who were over the age of 20 years, nearly half showed evidence of the disease. It is justifiable to exclude patients under this age since this disorder has been rarely recognised under the age of 30 years.^{11,12} In the two families that did not show evidence of familial involvement, both parents of the proband were not available for examination, and therefore autosomal dominant inheritance could not be ruled out.

Although over half of the patients identified with adult vitelliform macular dystrophy were asymptomatic, the visual prognosis is

not totally benign. The vision in nearly 10% of eyes was less than 6/12, and a 31 year old female had a visual acuity of 6/60 in one eye. One patient had loss of reading vision in both eyes at the age of 60 years, the result of bilateral atrophic lesions, an occurrence that Gass states he has not seen.¹¹

We found considerable variation in the size and shape of foveal lesions in this entity between families, and within a given family. Additionally we noted perifoveal pigmentary changes seen mostly in the third decade of life which may represent early lesions, or lesion in development.

The debate in the literature questioning the heredity of adult vitelliform macular dys-

Fig. 4a.

Fig. 4b.

Fig. 4c.

Fig. 4d.

Fig. 4. The 28 year old sister of the proband who had visual acuity of 6/12 in the right eye and 6/9 in the left. At each fovea was accumulation of material at the level of the retinal pigment epithelium. (4a,c) Fluorescein angiography showed hypofluorescence centrally in both eyes and marginal hyperfluorescence in the right. (4b,d).

Table: Summary of ocular findings

Age years	Number examined	Number with abnormal fundi	Number with typical AVMD*	Number with VA RE	Number with <6/12 LE
<20	8	0	0	0	0
20–29	12	1	0	0	0
30–39	8	6	3	1	0
40–49	5	5	4	2	0
50–59	5	4	4	0	2
60–69	12	8	6	1	2
<70	2	1	1	1	1
Total	52	25	18	5	5

* Adult vitelliform macular dystrophy.

trophy may arise from the inclusion in studies of patients with lesions similar to, but not typical of the disorder. Such lesions may occur in age related macular degeneration. Furthermore if familial involvement is ascertained by history alone, it is possible that affected family members may not be known to the patient. More than 50% of patients in this study were asymptomatic and the visual loss was characteristically mild. Eight out of the ten probands in this study with proven inherited disease, were unaware of having affected relatives.

If adult vitelliform dystrophy proves to be a single nosological entity which is autosomal dominant it would avoid confusion if the term adult vitelliform macular dystrophy were restricted to lesions similar to those described by Gass with autosomal dominant inheritance, and phenocopies be given a different name.

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