Ectodermal dysplasia with blindness in sibs on the island of Rodrigues

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Abstract

A brother and sister from the island of Rodrigues had mental retardation, blindness owing to severe ocular malformations, short stature, dysmorphic facial features, hypotrichosis, and dental abnormalities. It is likely that they have a hitherto unrecognised autosomal recessive ectodermal dysplasia syndrome

During a recent survey of genetic disorders among the disabled children from the Indian Ocean islands of Mauritius and Rodrigues, a number of unique genetic entities were encountered.¹ In this paper, we document the clinical features of two sibs with similar

unusual facial features, mental retardation, short stature, ocular abnormalities, and blindness. The findings are suggestive of a previously unreported ectodermal dysplasia and independent syndromic status is proposed.

Case reports

The kindred were resident on Rodrigues, a remote Indian Ocean island measuring 18 kilometres in length by 8 kilometres at its greatest width, lying at a longitude of 63° 25' east and a latitude of 19° 41' south. The population of approximately 25 000 inhabitants represents a genetic isolate, both geographically and socially. The family are members of the local Creole community with an ancestry of mixed European, African, and Indian origins. A pedigree is shown in fig 1.

The parents of the affected children were middle aged Rodriguans, born in the same island valley. Consanguinity could not, however, be confirmed and a comprehensive family history was non-contributory. They had six normal children (four males and two females) and two affected offspring, a girl (II-5, patient 1) and a boy (II-7, patient 2). Their two oldest children each had normal progeny. Members of the family are portrayed in fig 2.

Figure 1 The pedigree of the kindred.

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Figure 2 Members of the kindred from left to right: I-2, II-4 (aged 21), II-5 (patient 1 aged 19), II-6 (aged 15), II-7 (patient 2 aged 9), II-8 (aged 3).

PATIENT 1 (II-5)

This girl was born at term after an uneventful prenatal course, labour, and delivery. At birth, ocular abnormalities were noted but otherwise the infant was considered normal by the parents. No growth parameters were available for the childhood period but psychomotor development was delayed relative to her older sibs. She first walked between 3 and 4 years of age and speech at the age of 8 years was limited to simple sentences. She was consistently shorter in stature than her peers and by the age of 12 years was capable of carrying out only the simplest tasks.

On examination at the age of 19 years, she had proportionate short stature with growth parameters below the 3rd centile (height 135 cm, head circumference 49 cm). Informal assessment of intelligence placed her in the category of 'trainable' or 'moderate' mental retardation (IQ = 30 to 50). Although menstruation had been fully established since the age of 12 years, breast development was minimal, axillary hair was absent, and pubic hair growth was scanty.

Dysmorphic facial features (fig 3) included fine, sparse hair, a narrow nasal bridge with marked distal flaring, protruding ears, a short upper lip, a broad alveolar margin, and intact

Figure 3 Patient 1 (II-5): dysmorphic facial features include fine, sparse hair, narrow nasal bridge with distal flaring, a narrow upper lip, prominent ears, and protuberant, widely spaced teeth.

palate. Her upper central incisors were barrel shaped and prominent, the lower incisor notched, and the teeth were widely spaced. Her ocular abnormalities included bilateral microphthalmos and microcornea with sclerocornea (fig 4). The structural eye abnormalities precluded examination of the fundus but cataracts were not detected. Vision was limited to light perception.

Figure 4 Patient 1 (II-5): microphthalmos and microcornea are evident.

Figure 5 Patient 2 (II-5), aged 9 years, with proportionate short stature, mental retardation, blindness, and dysmorphic facial features.

Systemic examination was normal. In particular, there were no neuromuscular abnormalities, the skeleton including hands and feet was normal, and there was neither skin dyspigmentation nor clinical evidence of dyshidrosis. Examination of the cardiovascular system was normal.

No facilities existed on the island for studies of histology, radiography, or biochemistry.

PATIENT 2 (II.7) (FIG 5)

This boy was noted to be blind at birth after a normal term pregnancy and delivery. His growth and development were delayed during infancy and childhood relative to his peers and normal sibs.

On examination at the age of 9 years, his height was 120 cm and his head circumference 47 cm (less than the 3rd centile for age). His growth parameters were proportionally decreased and assessment of intelligence placed him in the range of moderate mental retardation (IQ = 30 to 50). His hearing was normal, his palate was intact, and he had no skeletal, visceral, neuromuscular, nail, or dermatological abnormalities.

The dysmorphic facial features bear a striking resemblance to patient 1. He had low slung, cupped ears, fine, sparse hair, a narrow nasal bridge with distal flare, and a short upper lip (fig 6). His alveolar margin was wide and

Figure 6 Patient 2 (II.7): facial features include cupped, low slung ears, narrow nasal bridge with distal flare, sparse, fine hair, and microphthalmos.

his teeth were malaligned with hypoplasia and notching of the lower incisors. Ocular changes included microphthalmos, microcornea, and sclerocornea (fig 7). The fundi could not be visualised and he had total blindness.

Discussion

The affected brother and sister have closely similar clinical features of psychomotor delay, growth retardation, bilateral ocular abnormalities including microphthalmos, sclerocornea, and microcornea, sparse, thin hair, facial dysmorphism with protruding ears, a narrow nasal bridge with distal flare, a short upper lip, and abnormalities of dental alignment and formation. The clinical setting and the genealogical data support an autosomal recessive mode of inheritance for this disorder.

Figure 7 Patient 2 (II.7): ocular abnormalities include microphthalmos, microcornea, and sclerocornea.

A number of neuroectodermal syndromes have been delineated,² yet none appears to have the combination of dysmorphic features presented by these Rodriguan sibs. The oculodentodigital syndromes (ODD dysplasias) have similar hair and dental abnormalities and a spectrum of ocular findings that bear resemblance to the Rodriguan children but can be distinguished by their associated skeletal manifestations.³

The Hallermann-Streiff syndrome (oculo-mandibulofacial syndrome) has the features of proportionate growth retardation, microphthalmos, and hypotrichosis and might be considered in our patients. However, the characteristic facial appearance of the Hallermann-Streiff syndrome excludes this diagnostic possibility.⁴ The association of microphthalmos and microcornea with mental retardation is well described and heterogeneity is recognised.⁵ However, the concomitant ectodermal features of hypotrichosis and dental dysplasia, present in the subjects of this paper, appear to be unique. A survey of published reports of the ectodermal dysplasias failed to elicit a similar condition.

We consider that these two sibs from an endogamous island community represent a newly recognised ectodermal dysplasia with psychomotor retardation, short stature, and ocular abnormalities with blindness. It is anticipated that the presence of this putative autosomal recessive gene in an isolated community such as Rodrigues might result in the birth of further affected children on the island. It is hoped that the delineation of this phenotype will alert physicians to the possible presence of similarly affected persons in other population groups and stimulate further reports to substantiate the genetic basis and autonomy of this entity.

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