

Case Report

Ectodermal Dysplasia, Ectrodactyly and Macular Dystrophy Syndrome (EEM): A Rare Case Report

Fouzia Hali, Rajaa Bousmara, Soumia Chiheb, and Hakima Lakhdar

Department of Dermatology and Venereology, Hassan II University, Morocco

*Corresponding author

Fouzia Hali, Department of Dermatology and Venereology, CHU Ibn Rochd, 1, Rue des Hôpitaux, Casablanca, Morocco, Tel: 212-664-859732; E mail: halifouzia@yahoo.fr

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Keywords

- Ectodermal dysplasia
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- Autosomal recessive inheritance
- X-Linked

Abstract

EEM syndrome is a rare congenital disorder characterized by the association of ectodermal dysplasia, ectrodactyly and macular dystrophy. Only 17 cases have been reported so far, and autosomal recessive mode of inheritance has been proposed. We report a case of an 11-year-old boy presenting congenital alopecia universalis, ichthyotic lesions, dystrophic nails, ectrodactyly and photophobia, whose parents were not related and six maternal male relatives were affected by the same condition. Because the autosomal recessive mode of inheritance is unlikely in this case, an X-linked recessive mode is suggested, thus genetic heterogeneity of the disorder has to be considered.

ABBREVIATIONS

EEM: Ectodermal Dysplasia, Ectrodactyly, Macular Dystrophy;
IFAP: Ichthyosis Follicularis, Alopecia, Photophobia

INTRODUCTION

EEM syndrome is characterised by the association of ectodermal dysplasia, ectrodactyly and macular dystrophy [1]. Since its first description in 1956, only 17 cases of this rare genodermatosis have been reported worldwide [1-9]. EEM syndrome appears to be transmitted as an autosomal recessive trait and may be caused by mutations in the cadherin-3 gene (CH3, 16q22.1) [10]. Here, we report a severe presentation of the EEM syndrome, with additional clinical features. This case represents the first EEM syndrome reported from Africa, to the best of our knowledge.

CASE PRESENTATION

We report a case of an 11-year-old male child presented with the complaints of generalized ichthyosis, dystrophic nails,

ectrodactyly and photophobia diagnosed as EEM syndrome. He had four siblings, of whom one brother showed the same clinical manifestations. His family history revealed similar cases in five male relatives (Figure 1). He was born of healthy non-consanguineous parents, delivery occurred at 30 weeks. Birth weight was 1,300 g. The medical history revealed a collodion membrane at birth and congenital alopecia involving the scalp, eyebrows and eyelashes.

At the age of one year, he developed epileptic spasms. The clinical and EEG data suggested West syndrome diagnosis, followed at the age of 3 years by generalized tonic-clonic seizures and childhood absence epilepsy. At 6 years of age, parents noted progressive nail deformities. He develops diffuse eczematous skin lesions by relapses and remissions, which occasionally become impetiginized accompanied by a severe pruritus.

Physical examination showed facial dysmorphism with a prominent forehead, large ears, prominent chin, generalized alopecia with absence of scalp hair, eyebrows, eyelashes and body hair (Figure 2). His teeth were normal. Ectrodactyly was

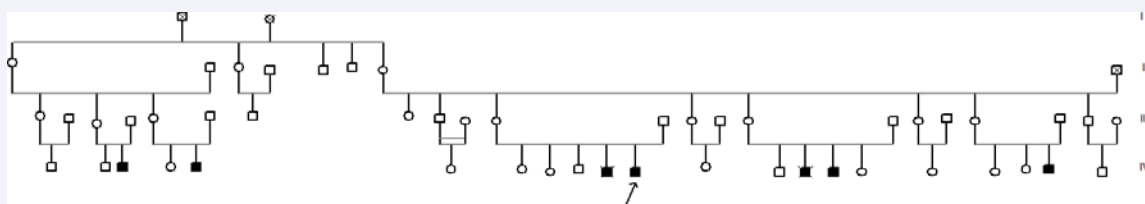


Figure 1 Family pedigree.

noted on the left hand. He also showed anonychia, progressive hyperkeratosis with onychogryphosis (Figure 3).

Sweating was normal.

He presented a generalized dry, thickened and scaling skin with lamellar ichthyosis characterized by large, hyperpigmented and quadrangular scales, on a background of erythematous skin, predominant over the scalp, lower legs, feet and the flexural surfaces (Figure 2-4). Red exanthema with generalized exfoliation prominent on the abdomen. The lesions were impetiginized especially in the scalp and abdomen (Figure 4). He also showed diffuse plantar keratoderma with painful fissures (Figure 5). Neurological examination was normal. External genitalia exam showed bilateral cryptorchidism. Ophthalmologic evaluation revealed a photophobia. Slit lamp examination revealed keratitis, total corneal neovascularization and bilateral central corneal opacities.

Echocardiogram and Abdominal sonography were unremarkable. His EEG revealed a generalized epilepsy. Dermatological examination of his mother was normal.

Complete blood count and immunological tests showed an increase in the number of leukocytes especially eosinophils

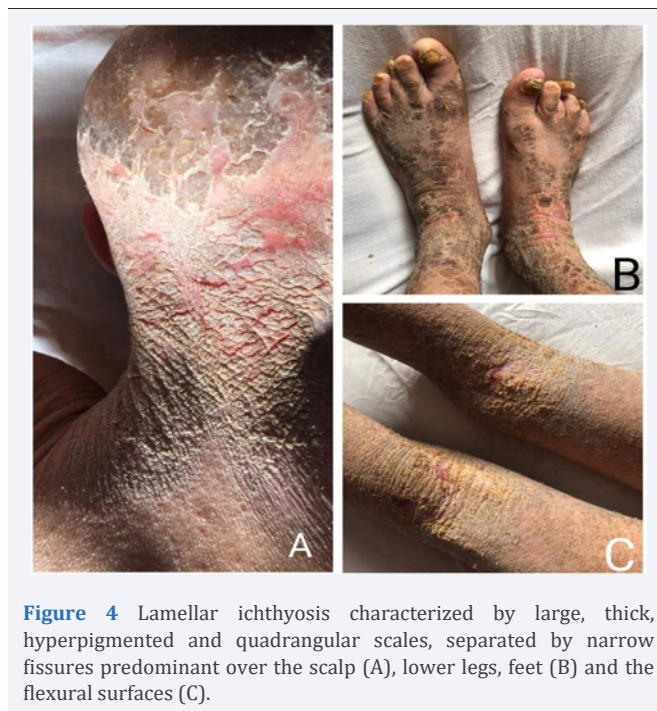


Figure 4 Lamellar ichthyosis characterized by large, thick, hyperpigmented and quadrangular scales, separated by narrow fissures predominant over the scalp (A), lower legs, feet (B) and the flexural surfaces (C).

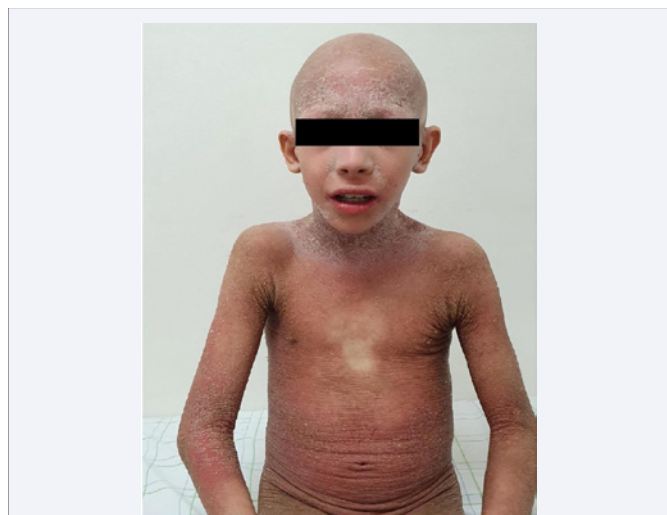


Figure 2 Photograph of the patient demonstrating generalized ichthyotic erythroderma, alopecia, no eyebrows, and no eyelashes with angular cheilitis and normal teeth.



Figure 5 Diffuse plantar keratoderma with large fissures.

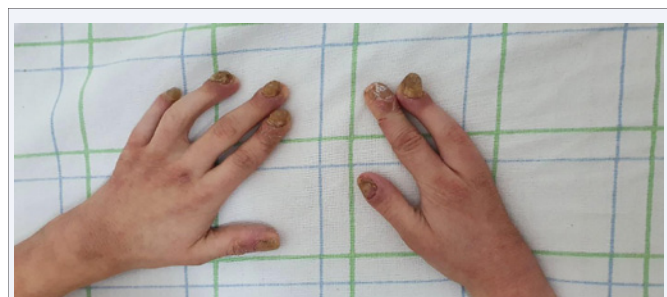


Figure 3 Ectrodactyly in the right hand with Lobster's claw malformation. Note the dystrophic fingernails with pachyonychia.

(2,340/ μ l), a high serum IgE level (> 9407 IU/ml). Biochemical tests were all normal. Immunostaining for IgG, IgM and IgA was negative.

DISCUSSION

EEM syndrome is a rare inherited disorder characterized by ectodermal dysplasia, ectrodactyly, and macular dystrophy (OMIM 225280) [11]. It was first reported by Albrectsen and Svendsen [1909] in 2 siblings: a 4-year-old boy and his 6-year-old sister of consanguineous parents presenting with sparse head hair, normal teeth, syndactyly and retinal degeneration [2]. Clinical manifestations identified in our patient were felt to be consistent with the EMM syndrome but with severe skin lesions, plantar keratoderma, seizures and increase of IgE level in serum never seen before in any other patient.

Table 1: Summary of clinical features of present and previously reported cases of EEM syndrome.

Author	Csga	Sex	Age(y)	Skin	Hair	Teeth	Hands	Feet	Eyes	Nails
Albrechtsen and Svendsen [2]	Yes	F	6	-	Hypotrichosis	Small,WS	Syndactyly	Normal	MD	-
		M	4	-	Hypotrichosis	Normal	Ectrodactyly	webbing	MD	-
Hayakawa et al [5]	Yes	F	41	-	Hypotrichosis	Small Decayed	Ectrodactyly	-	MD	-
Ohdo et al [1]	-	3F 2M	16-10-39 45-42	-	Hypotrichosis	Small Anodontia	Ectrodactyly	Syndactyly Hypoplasia Ectrodactyly	MD	-
Kuster et al [6]	No	M	31	-	Hypotrichosis	-	Small	Small	MD	-
Balarin Silva et al [3]	No	M	23	Café au lait spots	Hypotrichosis	Small,WS	Syndactyly	Normal	MD	Normal
		M	25	-	Hypotrichosis	Small,WS	Webbing	-	MD	-
Senecky et al [4]	No	F	14	Normal	Hypotrichosis	Normal	Hypoplasia	-	MD	-
		M	10	Normal	Hypotrichosis	Normal	Syndactyly Hypoplasia	-	MD	-
Van Genderen MM et al [9]	No	F	1	-	Hypotrichosis	Small, WS oligodontia	Syndactyly Ectrodactyly	-	MD	-
		M	9m	-	Hypotrichosis	WS	Syndactyly Ectrodactyly	-	MD	-
Alexis G matos et al [8]	Yes	F	15	-	Hypotrichosis	-	Syndactyly	-	MD	-
		F	9	-	Hypotrichosis	-	Syndactyly	-	MD	-
Present study	No	M	11	LI Eczematous lesions PK	Alopecia totalis	Normal	Ectrodactyly	Normal	MD	Dystrophic nails

Abbreviations : Csg: Consanguinity; M : Male; F: Female; Y: Years; WS: Widely Spaced; MD: Macular Dystrophy; LI: Lamellar Ichthyosis; PK: Plantar Keratoderma

Balarin Silva et al. [3], reported a non-consanguineous Brazilian family in which two brothers presented the complete form of EEM syndrome with hypotrichosis, small and widely spaced teeth, bilateral syndactyly, and retinal changes with prominent pigmentation in the posterior pole of the retina, but nail and body hair were normal. In this family, there was also another sib with syndactyly, as well as a first cousin with ectrodactyly. The clinical findings reported by Ohdo et al of a family of five patients and those reported by Senecky in two siblings were similar to our case but with an attenuated form [1,4]. Table I presents a summary of the clinical features of the previously reported cases. The EEM syndrome can be easily mistaken with other types of genodermatosis that also express ichthyotic lesions, dystrophic nails and ectrodactyly, such as IFAP syndrome. This condition differs from the EEM syndrome by the absence of pigmentary alterations of the ocular fundus [7].

There were some similarities to the Netherton syndrome. Our patient showed ichthyosiform erythroderma and elevated IgE levels but we did not find Trichorrhexis invaginata and patients with this syndrome show no limb defect and no abnormalities of teeth. Though Trichorrhexis invaginata is highly specific, its absence does not exclude the diagnosis of Netherton syndrome [12]. It is imperative to understand the clinicopathological differences that help distinguish EEM syndrome from other diseases, in order to make the right diagnosis.

Cases described by Ohdo et al, Albrechtsen and Svendsen

show that the parents are consanguineous and that both sexes are affected [1,2]. Therefore it is thought that this syndrome is transmitted in an autosomal recessive mode, but according to the clinical presentation of our patient and those described by Balarin Silva [3], we suggest that a novel X-linked recessive mode of inheritance may be responsible, hence the possibility of genetic heterogeneity in this syndrome.

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