INDIAN J DERMATOL VENEREOL LEPROL 1985; 51 : 229-233

HYPOHIDROTIC ECTODERMAL DYSPLASIA WITH FEATURES OF ACANTHOSIS NIGRICANS AND CHRONIC CANDIDIASIS

Lalit Mohan, Bhushan Kumar, Surrinder Kaur and Inderjeet Kaur

Three siblings having hypohidrotic ectodermal dysplasia are described. In addition to trichodysplasia, odonto-dysplasia and hypohidrosis, they had acanthosis nigricans of the ano-genital area and lesions suggestive of candida infection as evidenced by chronic paronychia in the finger and toe-nail folds, and maceration in the groins. The youngest brother also had a cutaneous horn in the sacral region. Eyes showed a small inter-palpebral fissure, myopia, dull foveal reflex and a convergent squint. Parents were non-consanguinous. There was no demonstrable cell mediated immune defect.

Key words : Ectodermal dysplasia, Dyshidrosis, Trichodysplasia, Acanthosis nigricans, Candidiasis, Cell mediated immunity.

The ectodermal dysplasias (EDS) constitute a heterogenous group of disorders that may include as many as 40 distinct syndromes.[1] These dysplasias appear to share certain morphological features, and are therefore, examples of phenotypic heterogenicity. Essentially, it is a syndrome of incomplete development of the epidermis and its appendages. The disorder is congenital, diffusely present and non-progressive. Approximately 200 cases of this disorder have been reported in the world literature and many excellent reviews on the subject are available.[2-6]

As many as 52 recognisable syndromes have been listed,[7] but the broad classification into hidrotic and anhidrotic is more useful and practicable. We describe the disorder in three brothers, who also had associated lesions like acanthosis nigricans and candida infection in the groins.

From the Department of Dermatology, S.T.D. and Leprology, LLRM Medical College, Meerut and Post-graduate Institute of Medical Education and Research, Chandigarh-110 012, India.

Address correspondence to : Dr. Bhushan Kumar, Department of Dermatology, STD & Leprology, Post-graduate Institute of Medical Education and Research, Chandigarh 110 012, India.

Case Report

A 17-year-old male, presented with total absence of hair all over the body, diminished sweating and heat intolerance since birth. He had dryness and fissuring of the skin especially during winter months since early childhood. The patient was aware of jutting out of the ear pinnae and because of photophobia, lacrimation and weak eye-sight, he was unable to continue his studies beyond 7th class. Rhinorrhoea was troublesome since five years, abnormal swelling of the lips and fleshy growths in the ano-genital region were present since two years.

He was born at term, but all milestones were slightly delayed. Milk teeth however, erupted at the scheduled time and were apparently normal. There was no noticeable mental retardation. The sexual desire appeared normal for his age as told. Routine general and systemic examination was normal. Testicular volume was 20 ml.

The patient had characteristic facies with frontal bossing, prominent supra-orbital ridges, flared out pinnae (Satyr like ears) and swollen protruding lips. There was recession of the chin with wrinkling around the eyes and mouth. The permanent teeth were malformed, irregular

and abnormal in direction, lower central incisors were missing and the teeth were widely spaced. Tip of the nose was beaked, but the bridge was not depressed. There was evidence of chronic rhinitis and pharyngitis and the voice was hoarse. There was a continuous watery discharge from the nose. Gums showed chronic gingivitis. Cutaneous examination revealed absent hair (Fig. 1). all over the body including the secondary sexual sites, slight follicular prominence was noted. Skin was rough, dry, scaly and ichthyotic at places over the trunk. Palms were normal. Soles showed hyperkeratosis and fissuring at the borders. Finger and toe nails showed dystrophy and irregularity. There was evidence of chronic paronychia of the proximal nail folds of both the great toes and right index finger. Ano-genital region showed an area of well defined hyperkeratosis, encircling the root of penis, scrotum, anal canal, reaching upto the lower part of the sacrum. The skin in the groins was erythematous, hyperkeratotic, oozing and sodden (Fig. 2). Dental examination showed missing lower central incisors, upper central incisors palatally placed and upper lateral incisors labially placed. Salivation was decreased. Gums were swollen with an irregular margin showing evidence of chronic gingivitis. Eye examination showed small interpalpaberal fissure, myopia and dull foveal reflex. There was convergent 15°squint in the left eye.

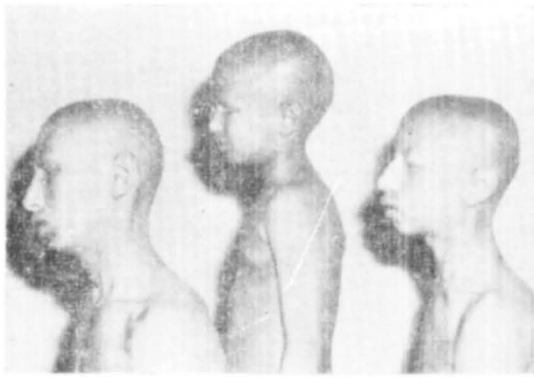

Fig. 1. Complete absence of hair in all the three brothers.

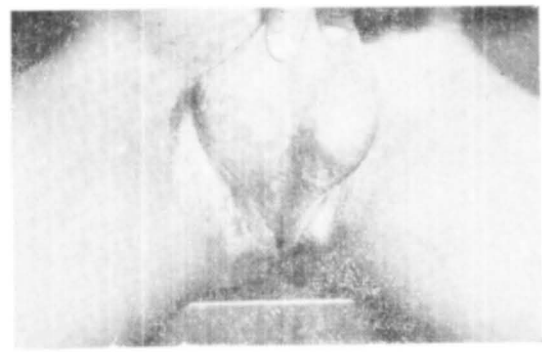

Fig. 2. Hyperkeratotic, moist sodden areas in the groins.

Routine investigations on urine, stools and hemogram were normal. Peripheral blood film was normocytic normochromic with adequate platelets. Fasting blood sugar, serum calcium, phosphorus, alkaline phosphatase and electrolytes were also normal. Basal testosterone level was 3.9 μg/ml (normal 1.0—5.0 μg/ml). T cell count was 62% and B cells were 29% with normal blastogenic response to PHA and Con A. X-ray of chest was normal. X-ray of the anterior mandibular region showed absence of central incisors and the spacing irregularity of teeth.

Skin biopsy from the forearm showed rudimentary sweat glands and ill developed hair follicles. Sebaceous glands were not seen in the section. Biopsy taken from the pubic region showed hyperkeratosis and mild acanthosis and well developed papillomatosis. Very occasionally, mature eccrine sweat glands were seen. Apocrine and sebaceous glands were sparse.

There was no history of consanguinity in the parents. Two younger brothers of the propositus had exactly simliar complaints and clinical presentation, the youngest brother in addition, had a cutaneous horn in the sacral region (Fig. 3). No other blood relative was known to be similarly affected.

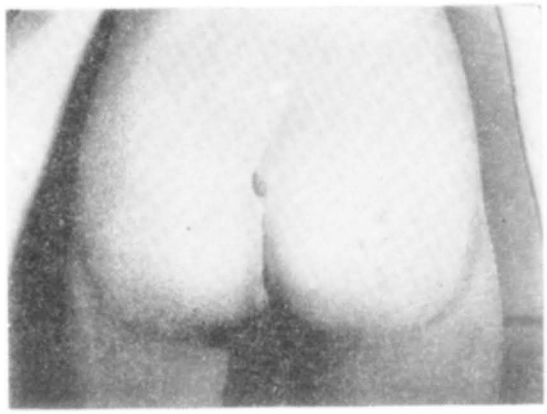

Fig. 3. Cutaneous horn in the sacral area of the youngest brother.

Comments

The earliest descriptions of ectodermal dysplasia were by Danz,[8] Wedderburn[9] and Thurnan.[10] In 1913, Christ[11] named the disorder as congenital ectodermal defect. The tendency for the disorder to occur in two forms became apparent from Goeckerman's description in 1920,[12] when patients with decreased ability to sweat were picked up. The term hereditary ectodermal dysplasia was first used by Weech,[13] although patients with dysmorphic defects in the cutaneous structures were described earlier.[2,6,10,12,15] Clouston[16] classified the disorder into anhidrotic and hidrotic forms. Later, Felsher[17] pointed out that there is seldom complete absence of sweating and hence coined the term, hypohidrotic ectodermal dysplasia. The syndrome consists of hypohidrosis, hypodontia, hypotrichosis and associated abnormalities in structures derived from the embryonic ectoderm. The transmission is thought to be autosomal recessive.

There may be in addition, onycho-dysplasia, decreased pigmentation of hair, skin, eyes and a very high incidence of atopic dermatitis.[18] A peculiar anomaly of the hair shaft has been described.[5,19] Clouston[16] found nails often normal. The breast tissue may be minimal or absent[6,16] and the anterior lobe of pituitary may often exhibit dysfunction. Poor development of the glands in the respiratory and gastrointestinal tract may increase susceptibility to respiratory infections. Ocular abnormalities are unusual, but corneal and lenticular opacities have occurred. Cellular immune defects have been described.[18] Physical development is usually normal, the expectation of life is normal or slightly altered.

The dominantly inherited form of ectodermal dysplasia has come to be known as hidrotic ectodermal dysplasia or Clouston syndrome,[16] characterised by features of nail dystrophy, hypotrichosis and thick dyskeratotic skin on the palms and soles. The disorder is decidedly more common in the males, only about ten per cent of the total cases reported were in women. Recently, premature cataracts in a family with hidrotic ectodermal dysplasia have been described.[4] Less frequently, mental deficiency, hyperpigmentation, poly and syndactyly or hearing loss may be present.

Freire Maia[20] had suggested that to qualify as ectodermal dysplasia, the disorder must demonstrate a primary abnormality of the hair, teeth, nails and eccrine glands, in addition to the other ectodermal signs such as abnormality of the ears, lips, dermatoglyphics or central nervous system. They proposed a working classification, with abnormalities of the ectodermal dysplasia, (1) trichodysplasia, (2) odontodysplasia, (3) onychodysplasia, and (4) dyshidrosis i. e. anhidrosis etc. Defects of the other ectodermal structures (ectodermal signs alone) were grouped in the fifth category. Within this system, anhidrotic and hypohidrotic ectodermal dysplasia were designated at 1-2-3-4 disorder and hidrotic dysplasia 1-2-3. It has been pointed out that the disease not only involves the skin and other structures derived from the ectoderm[7] but also the structures derived from the mesoderm and endoderm, thereby invalidating the concept of one layer disease.

Putting the various features together, our patients appear to belong to the category of hypohidrotic ectodermal dysplasia, having features of trichodysplasia (rather complete absence), odontodysplasia, nail dystrophy, dyskeratotic skin of soles, mucous membrane involvement, borderline mental deficiency and all the children being males. Eye involvement in the form of convergent squint, myopia and dull foveal reflex seen in our patients have not been described earlier. Despite marked abnormalities of the ectodermal structures, eye involvement is distinctly uncommon,[21] sporadic and varied abnormalities reported so far include corneal defects like microcornea, corneal thinning, opacification and vascularisation, bilateral corneal pannus and kerato-conjunctivitis sicca,[22-24] chorio-retinal atrophy,[25] strabismus,[16,26] deficient lacrimal secretion,[3] partial aplasia of the lacrimal outflow system etc.[27] Punctate epithelial dystrophy,[28,29] and stromal opacities[30] have also been observed. Cataracts were not considered a part of the disease until Gregory[25] and Marshall[31] described them. Hazen[4] reported cataracts recently. Vasomotor rhinitis and high arched palate have also been described.[1]

The association of well developed acanthosis nigricans and chronic candidiasis in the anal region and nail folds (chronic paronychia) has not been often described. The dysplastic epidermal growth may explain the acanthosis like lesions but the presence of chronic candidal over-growth producing macerated foul smelling lesions in the anogenital region and paronychia with unimpaired CMI are difficult to explain. Wilson et al[24] described a patient with acanthosis nigricans and hyperkeratosis of the palms and soles. Probably, the patients described by Hazen et al[4] had early lesions of acanthosis nigricans in the form of erythema, scaling and lichenification in two of the five patients. Lesions of angular stomatitis and cheilitis clinically suggestive of advanced candidiasis were present in all of his patients.

The occurrence of the disease in the three male sibs can be explained on the basis of autosomal recessive inheritence in the absence of affliction of any other immediate relation or family member in the two preceding generations, who were either examined or inquired about in the family hisotry.

References

1. Witkop CG, Brearley LJ and Gentry WC : Hypoplastic enamel, onycholysis and hypohidrosis inherited as an autosomal dominant trait—A review of ectodermal dysplasia syndromes, Oral Surg, 1975; 39 : 71-86.
2. Mac Kee GM and Andrews GC : Congenital ectodermal defect, Arch Dermatol Syphilol, 1924; 10 : 673-701.
3. Upshaw BY and Montgomery H : Hereditary ectodermal dysplasia, Arch Dermatol Syphilol, 60 : 1170-1949;1183.
4. Hazen PG, Zomora I, Bruner WE et al : Premature cataracts in a family with hidrotic ectodermal dysplasia, Arch Dermatol, 1980; 116 : 1385-1387.
5. Solomon LM and Keuer EJ : The ectodermal dysplasias, Problems of classification and some newer syndromes, Arch Dermatol, 1980; 116 : 1295-1299.
6. Singh A, Jolly SS and Kaur S : Hereditary ectodermal dysplasia, Brit J Dermatol, 1962; 74 : 34-37.
7. Freire-Maia N : Ectodermal dysplasias revisited, Acta Genet Med Gemellol, 1977; 26 : 121-131.
8. Danz : Concerning men without hair or teeth, Stark's Arch Gebuet, 1972; 5 : 684.
9. Wedderburn W cited by Darwin C : The variation in plants and animals under domestication, Vol 2, D Appleton and Co Inc, New York, 1893; p 319.
10. Thurnan J : Two cases in which the skin, hair and teeth were vary imperfectly developed, Proc R Med Chir Soc, 1848; 31 : 71-81.
11. Christ J : Uber die Knogenit Ektodermalen Defekte und itre Bexiehungen Zu einauder Vikariierende Pigment—fur haarbildung, Arch f Derm u Syph, 1913; 116 : 685.
12. Goeckermann WH : Congenital ectodermal defect, with report of a case, Arch Dermatol Syphilol, 1920; 1 : 396-412.

13. Weech AA : Hereditary ectodermal dysplasia (Congenital ectodermal defect) : A report of two cases, Amer J Dis Child, 1929; 37 : 766-790.

14. Guilford SH : A dental anomaly, Dent Cosmos, 1883; 25 : 113-118.

15. Oliver EA and Gilbert NC : Congenital alopecia, Arch Dermatol Syphilol, 1926, 13 : 359-373.

16. Clouston HR : A hereditary ectodermal dystrophy, Can Med Assoc J, 1929 ; 21 : 18-31.

17. Felsher Z : Hereditary ectodermal dysplasia : Report of a case with experimental study, Arch Dermatol, 1944; 49 : 410-414.

18. Davis JR and Solomon LM : Cellular immunodeficiency in anhidrotic ectodermal dysplasia, Acta Dermato-Venereol, 1976; 56 : 115-120.

19. Aoyagi T and Porter PS : Genetic disorders of hair growth : Pathogenesis of human hair defects, in : Biology and Diseases of the Hair, Editors, Kotori T, Montagna W, Kiyoshi T et al : Baltimore, University Press, 1975; pp 473-488.

20. Freire-Maia N : Ectodermal dysplasias, Hum Hered, 1971; 21 : 309-312.

21. Etzine S : Dysplasie ectodermique avec manifestations oculaires, Bull Mem Soc Fr Ophthalmol, 1969; 82 : 155-160.

22. Altmeyer P and Schindera I : Hidrotic ectodermal dysplasia, Hautarzt, 1975; 26 : 631-637.

23. Wilkinson RD, Schopflocher P and RozenfeldM : Hidrotic ectodermal dysplasia with diffuse eccrine poromatosis, Arch Dermatol, 1977; 113 : 472-476.

24. Wilson FM, Grayson M and Pieroni D : Corneal changes in ectodermal dysplasia. Case report, histopathology and differential diagnosis, Amer J Ophthalmol, 1973; 75 : 17-27.

25. Gregory I : Congenital ectodermal dysplasia, Brit J Ophthalmol, 1955; 39 : 44-47.

26. Wilkey WD and Stevenson GH : A family with inherited ectodermal dystrophy, Can Med Assoc J, 1945; 53 : 226-230.

27. Mannkoff H and Hanney F : Zum erscheinungshild der Kongenitalen ektodermaten Dysplasien, Von Greafe's Ophth, 1958; 159 : 643.

28. Perabo F, Velasco JA and Prader A : Ectodermale dysplasia vom anhidrotischen typus, Helv Paediat Acta, 1956; 11 : 604.

29. Franceschetti A and Thier CJ : Ueber Hornhant dysteoprien bei Genodermatosen unter besonderer Berucksichtigung der Palmo-plantar Keratosen, Von Greafe's Arch Ophth, 1961; 162 : 610.

30. Jung EG and Vogel M : Anhidrotische Ectodermal dysplasia mit Hornheutdystrophie, Schweiz Med Wschr, 1966; 96 : 1477.