CASE REPORT
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Congenital Sensory Neuropathy as a Differential Diagnosis for Phagocytic Immunodeficiency

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ABSTRACT

There are few reports about congenital indifference to pain or Hereditary and Sensory Autonomic Neuropathy (HSAN). Several investigations for pathophysiology of this syndrome have been performed and different classifications about it. In this report we present a case of HSAN type II with general absence of pain and self amputations and leprosy–like damage of extremities which was suspected to be phagocytic immunodeficiency due to past history of repeated ulcer and abscess formation.

Key words: Congenital defect; Hereditary Sensory and Autonomic Neuropathies

INTRODUCTION

Congenital indifference or insensitivity to pain is an autosomal recessive or dominant inherited disease that occurs as a subgroup of several hereditary sensory neuropathies.[1,2]

Hereditary sensory and autonomic neuropathy (HSAN) is a rare syndrome chracterized by congenital insensitivity to pain, temperature changes and autonomic nerve formation disorders. HSAN is classified into five types. Such as sensory radicular neuropathy (HSAN I), congenital sensory neuropathy (HSAN II), congenital insensitivity to pain with anhidrosis (HSAN IV) and congenital indifference to pain associated with mental retardation (HSAN V).[2-4]

There are also other very rare HSAN syndromes which have been identified, mostly in single families, since the original classification was proposed by Dyck P.J in 1984.[1] Several pathophysiologies for these groups of diseases have been proposed.

There are marked degenerative abnormalities in peripheral and central nervous systems, but sometimes autonomic nervous system (in type III) is also involved too.[1] There is a progressive pattern in neurophathy with marked reduction of small myelinated and unmyelinated fibers and relatively axon size.[5] In an investigation, plasma beta endorphin levels in the two patients were significantly higher than normal where as plasma ACTH and cortisol levels were normal.[6] The defect is apparently in the central structures such as the thalamus, where painful impulses are normally interpreted. As a consequence of loss of pain sensation, multiple mutilations and many skeletal injuries occur after recurrent trauma, without any host defensive reflections against them.[7,8] Corneal opacities, scars of the tongue and oral tissues,[9-11] amputation of fingers and toes, recurrent osteoarthritis and soft tissue ulcerations are the results of indifference to pain.[9,10]

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CASE REPORT

A 4-year–old boy was referred to The Children Hospital Medical Center of Tehran University of

Medical Sciences because of damage to his right foot. The problem began several months prior to admission, following falling down from stairs. At first a small ulcer appeared on the right sole which got infected a few days later. An osteomyelitis of the 5th metatarsal bone was diagnosed resulting in total destruction of the bone (Figure 1).

Radiographic examination showed irregularity and lytic lesion of the 5th metatarsal. The patient had been a progeny of normal pregnancy, born at term with a birth weight of 3550 grams, from close relative parents. The patient showed mild to moderate neurodevelopmental delay and was unable to speak. He lost his teeth at age 2-3 years with multiple wound scars over his tongue (Figure 2).

There was general absence of pain in the patient but tactile sesation from early infancy remained normal. All indices of growth were under 3rd percentile. Autonomic system was intact. There was amputation of distal phalanx of the left index finger secondary to self–mutilation and superimposed infection associated with multiple wound scars due to previous damages. Also amputation of the anterior tongue after repeated bitings, was seen (Figure 2). Investigation revealed that motor and sensory nerve conduction velocities were greatly reduced compatible with axonal type neuropathy detected.

The patient was consulted with the Immunology department to study for probable immunological defects. Immunological invetigations are shown in table 1, which all were in normal ranges in comparison with controls.

Table 1. Laboratory results on this patient.

Laboratory test	Results
WBC	7500 cells/mm^3
Lymphocyte	65%
Polynuclear	25%
Blood culture	Negative
Urine Culture	Negative
Serum IgG	780 mg/dl
Serum IgM	50 mg/dl
Serum IgA	30 mg/dl
Serum IgE	120 IU/ml
CH50	98%
CD3	65%
CD4	50%
CD8	30%
CD19	10%
CD16	10%
CD56	12%
NBT	100%
Chemotaxis assay (Serumic, cellular)	Normal

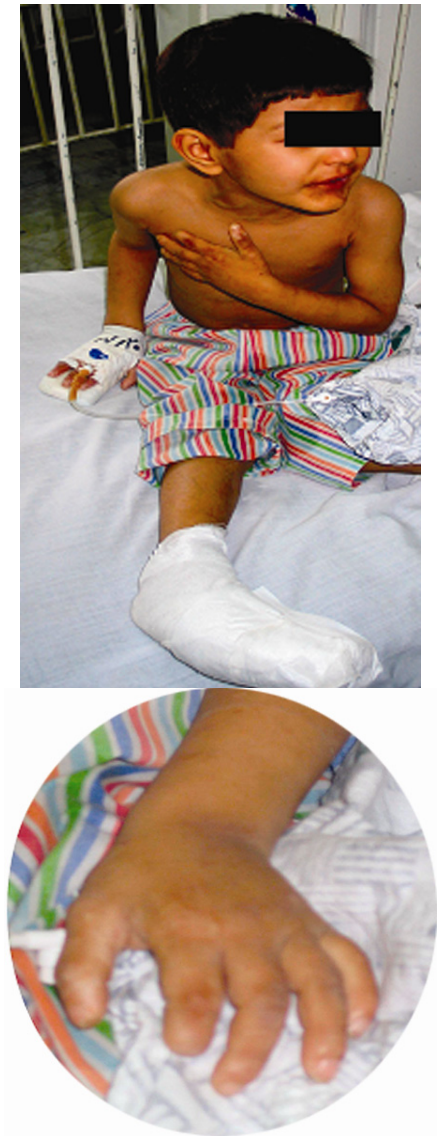

Figure 1. Osteomyelitis of the 5th metatarsal bone due to total destruction of the bone and amputation of distal phalanx of the left index finger.

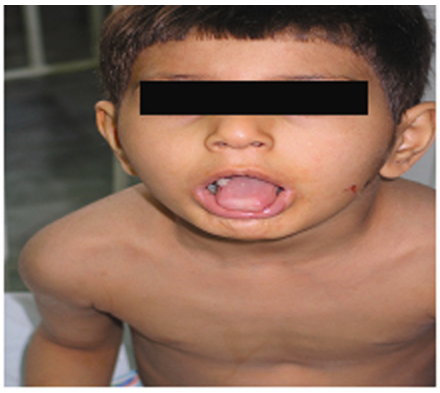

Figure 2. Amputation of the anterior tongue.

DISCUSSION

Among the most important differential diagnosis of Congenital Sensory Neuropathy are immuno-deficiencies, specially phogocytosis defects, because of recurrent ulcers, abscess formation and osteomyelitis. In one investigation on these patients, the decreased expression of Leu 7, Leu 9, Leu 19 as membrane antigens related to natural killer cells were found.[4] In our patient, primary immunologic assessments including phagocytic, humoral, cellular and complement systems were normal.

After hospitalization the patient was dignosed as a case of HSAN type II and the infections were treated with intravenous antibiotics. Eventualy he was discharged with prophylactic recommendations.

Congenital indifference to pain with recurrent ulcers, osteomylitis, amputations can mimic a phagocytic immunodeficiency; therfore the immune system disturbances especially phagocytic immuno-deficiencies have to be ruled out in these patients.

In addition to static or progressive central and peripheral neuropathies there are weak evidences for immune system involvement like natural killer cells dysfunction which needs further investigations.

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