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CASE REPORTS

Leprosy and Psoriasis: An Enigmatic Relationship[1]

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ABSTRACT

The relationship between leprosy and psoriasis has been controversial since ancient times. Based on the fundamental importance of nerve involvement in the pathogenesis of leprosy and psoriasis, it has been hypothesized that leprosy patients may be protected from developing psoriasis. There are only sporadic reports of coexistence of these two diseases as evidence of this negative association. We report a 64-year-old male patient with borderline leprosy and psoriasis. Recent advances in the elucidation of pathogenesis of both diseases have contributed to the understanding of this enigmatic relationship. Various genetic, immunological, and structural alterations in leprosy and psoriasis as discussed could be responsible for the rare co-existence of these two diseases in a given patient.

RESUMÉ

La relation entre la lèpre et le psoriasis est controversée depuis les temps les plus anciens. D'après l'importance fondamentale de la composante neurale dans la pathogenèse de la lèpre par rapport au psoriasis, il a été supposé que les patients hanséniens sont probablement protégés contre le développement du psoriasis. Il n'y a que quelques articles sporadiques sur la co-existance de ces deux maladies qui suggèrent une association négative. Nous rapportons ici le cas d'un patient masculin de 64 ans souffrant de lèpre borderline et de psoriasis. Les avancées récentes sur la pathogenèse de ces deux maladies ont permis de mieux comprendre cette relation énigmatique. Des altérations variées d'origine génétique, immunologique et structurelles comme discutées ici associées à la lèpre et le psoriasis pourraient être responsables de la co-existence rare de ces deux maladies chez un même patient.

RESUMEN

La relación entre lepra y soriasis ha sido controvertida desde tiempos muy antiguos. Sobre la base de la importancia de la afección a nervios en la patogénesis de la lepra y la soriasis, se ha postulado que los pacientes con lepra podrían estar protegidos contra la soriasis. Lo esporádico de los reportes sobre la coexistencia de las dos enfermedades es más bien una evidencia de esta asociación negativa. En esta comunicación informamos el caso de un paciente masculino de 64 años, con lepra BL y soriasis. Los avances recientes en la elucidación de la patogénesis de las dos enfermedades han contribuido a entender esta enigmática relación. Diversas alteraciones genéticas, inmunológicas y estructurales en la lepra y la soriasis podrían explicar la rara coexistencia de estas dos enfermedades en un paciente dado.

Controversies about the relationship between leprosy and psoriasis have existed since the time when people considered psoriasis to be a form of leprosy. The biblical term "lepra" included what is now called psoriasis ([11]). Undoubtedly, many psoriatic patients suffered the same physical and mental abuses as lepers of that era. This confusion between leprosy and psoriasis lasted for almost 19 centuries when it was

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realized that the two diseases are entirely different and have nothing common, not even the clinical appearance. In fact, in the latter half of the 20th century, a report on large number of leprosy patients followed up for about 40 years indicated a rarity of psoriasis among them ([13]). This observation stimulated the interest of many workers who have tried to explore the hypothesis that leprosy and psoriasis rarely develop in the same patient. With the better understanding of etiopathogenesis and immunological alterations in the two diseases, the basis for the rare occurrence of both leprosy and psoriasis in an individual is becoming clearer. So in a complete turn of events, the occurrence together has become a rather interesting rarity, and only a few such cases have been reported. We report another case of rare co-existence of the two diseases.

A 64-year-old male patient, presented to us with complaints of erythematous itchy scaly lesions all over the body with a history of relapses and remissions for a duration of 9 yrs. The patient was a treated case of borderline lepromatous (BL) Hansen's Disease and had received 3 yrs of multidrug therapy MDT-MB 13 yrs back. On examination, the patient had well defined erythematous, plaque lesions with silvery scales over the extensors of the limbs, trunk, and scalp involving almost 35% of the body surface area (Fig. 1). Nails were involved in the form of pitting, subungual hyperkeratosis, and onycholysis. Old lesions of Hansen's disease were almost inapparent without any evidence of clinical activity. Sensory loss was present over the area of distribution of both lateral popliteal nerves and the right ulnar nerve with grade I deformity of both feet and the right hand. Plaque type lesions were randomly distributed over limbs without any particular sparing of anesthetic areas. The patient was diagnosed as having extensive psoriasis. In view of the large body surface area involvement, the patient was started on tablet methotrexate (0.5 mg/ kg/week). Patient responded well to the treatment in 6 weeks with reduction in erythema, scaling, and infiltration.

There have been only sporadic reports of this co-existence published in the literature ([3, 8, 9, 12, 14]). An early report from Israel stated the rarity of psoriasis among leprosy patients ([13]). To further explore this hypothesis, Kumar, *et al.* ([5]) carried out a questionnaire survey to be filled out by physicians at leprosy centers in different parts of the world. In this survey, out of 145,661 cases of leprosy, only 20 individuals had psoriasis.

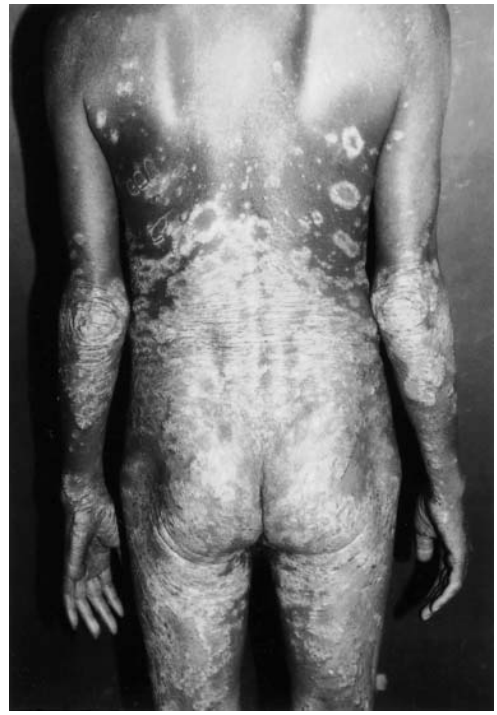

FIG. 1. Psoriatic plaques over lower back and extremities.

Nerve involvement is fundamental in the pathogenesis of leprosy. *Mycobacterium leprae* has the special characteristic of invading nerves, resulting in neuritis and nerve damage. However, in the pathogenesis of psoriasis an increasing number of biochemical and clinical studies also provide strong evidence for the functional role of cutaneous nerves and their neuropeptides. Psoriatic lesions have a significantly larger number of nerves with increased content of neuropeptides. The actions of neuropeptides like substance P (SP), vasoactive intestinal peptide (VIP), and calcitonin-gene-related peptide (CGRP) are of great significance in the inflammatory and proliferative process and symmetrical distribution of lesions in psoriasis ([4, 7, 10]). It has been documented that the damage to sensory nerves

results in clearance of psoriatic lesions in anesthetic areas, and that neuropeptide-modulating drugs like capsaicin, peptide T, somatostatin, spantide, etc. have some beneficial role in psoriasis ([2, 7]). Destruction of cutaneous nerve fibers and the consequent absence of neuropeptides from leprous skin is a well-known observation. Hence, it could be that the neuropathy caused by *M. leprae* infection results in structural and functional alterations in the cutaneous sensory nerves, so that the process of neurogenic inflammation, which seems to be an integral part of the psoriatic disease process, is inhibited.

Some workers have suggested that genetic factors may play a role in protecting psoriatic patients from leprosy. Population studies have found significant association of HLA-DR 2 and HLA-DQWI with leprosy, whereas in psoriasis there is high frequency of HLA–A1,–BB,–B16,–B17, CW6 and DR7 with reference to the general population. Recently most investigators have focused on the MHC class I region, with particular interest on the HLA–CW 6 allele in psoriatic patients. Now it has been established that T lymphocytes play major role in the pathogenesis of psoriasis with Th-1 type of cytokine profile triggering the chain reaction of cellular and molecular networks that culminate in the formation of a psoriatic plaque. There is increased activity of the reticuloendothelial system in patients with psoriasis in the form of enhanced metabolic, phagocytic and chemotactic functions of the polymorphonuclear leukocytes ([7]). This is contrary to what is observed in leprosy in which the involvement of the reticuloendothelial system and phagocytic system is characterized by reduced activity of peripheral blood mononuclear leukocytes and macrophages and depressed T-cell functional state ([1]).

Recently, apoptosis has been implicated to play an important role in the lymphocytic alterations in leprosy because a highly significant increase in the level of spontaneous apoptosis in leprosy patients as compared to controls has been reported ([6]). Apoptosis might represent a strategy of the immune system to eliminate infected cells. If apoptosis is a regular phenomenon in leprosy, in psoriasis the keratinocytes acquire an apoptotic resistant phenotype attributed to the over-expression of Bcl-X, and cell survival gene products, and other growth-regulatory or cell cycle changes ([7]).

In our patient, psoriatic lesions were distributed randomly over the normal as well as previously involved hypoaesthetic skin areas. It is known that an adequately treated patient may have some regeneration in the affected nerves that were not completely destroyed. According to the hypothesis outlined above, the occurrence of lesions on the hypoaesthetic areas can be explained.

Leprosy though is one of the oldest diseases known to mankind; several mysteries and basic facts about *M. leprae* and the disease they produce are still unexplained. Various genetic, immunological, and structural alterations in leprosy and psoriasis as discussed above could be responsible for the rare co-existence of two diseases in an individual patient.

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