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Multibacillary Leprosy Presenting as a Solitary Skin Lesion; Report of Three Cases and Its Significance in Control Programs[1]

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Leprosy is a unique example of chronic granulomatous disease which has been graded in severity from the highly resistant or tuberculoid group to the anergic or lepromatous group. By and large the clinical and laboratory criteria fit well into this spectrum which still remains an excellent guide for all workers engaged in treating patients with leprosy. Recent reports ([2, 5]) of lepromatous leprosy (LL) presenting as a single skin lesion show that the disease can at times behave in a different manner, although the explanations for such occurrences are yet to be unearthed by research workers. We are presenting data on three patients in our leprosy clinic who each had a solitary skin lesion and were clinically diagnosed as paucibacillary leprosy but, histopathologically, proved to be multibacillary forms of the disease.

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CASE REPORTS

Case 1. A 16-year-old boy came with an insensitive patch on the right forearm of 2 months' duration. There was no history of similar complaints in his family members, and he had sought no therapy earlier. On local examination a relatively well-defined, anesthetic, indurated plaque 4 cm in diameter was seen on the middle of the extensor surface of the right forearm. Hairs were lost and sweating diminished in that area. One indurated, red satellite lesion 0.5 cm in diameter was also seen. The regional and cutaneous nerves in the vicinity of the patch were not thickened. Other areas of the skin appeared normal. Clinically, a diagnosis of borderline tuberculoid (BT) leprosy was made. A routine blood and urinalysis, skin biopsy and lepromin test were done. The patient was prescribed paucibacillary multidrug therapy (MDT) as recommended by the World Health Organization (WHO) ([4]).

Four weeks later the lepromin (Mitsuda) reading was 4 mm × 4 mm, and the histopathology report (H&E) revealed a diffuse epithelioid-cell granuloma in the dermis with scanty lymphocytes. The papillary zone was clear with mild swelling and infiltrate

in the dermal nerve twigs. Fite-Faraco's stain for acid-fast bacilli (AFB) showed a bacterial index (BI) of 2+ (Ridley scale). These findings were consistent with a diagnosis of midborderline (BB) leprosy, and the patient was given three drugs as advised for multibacillary leprosy ([4]). Slit-skin smears for AFB from the usual six sites (ears, eyebrows and back, including buttock) were negative. A slit-skin smear from the skin lesion showed occasional AFB after prolonged search. A year later, a repeat biopsy showed a BT-type granuloma in the dermis and no AFB. Clinically, the lesion had regressed well in size and induration. A lepromin test read 6 mm × 6 mm. Treatment was continued for one more year and a biopsy at the end of 2 years of therapy showed few foci of nonspecific infiltration in the dermis and no AFB. Clinically, the sensory loss in the patch had recovered by almost 50%. Treatment was stopped and the patient kept under surveillance.

Case 2. A 35-year-old man came to our clinic with impairment of sensation on the front of the thigh of 1 year's duration. He had taken no previous therapy, and the area was gradually increasing in size. On examination, a solitary anesthetic area 10 cm × 6 cm in size was seen on the anterior part of the right thigh. Erythematous induration was seen in the border of the patch which appeared somewhat wavy at the lower margin of the lesion. Regional and cutaneous nerves in and around the lesion and the rest of the skin surface were normal. A provisional clinical diagnosis of tuberculoid minor type of leprosy was made and, after the necessary tests, he was prescribed paucibacillary MDT.

On follow-up the lepromin test was negative and histopathology (H&E) showed a normal epidermis and a focal collection of epithelioid cells in a perineurial location. Some nerve twigs showed edema and mild lymphocytic infiltration. AFB were seen after staining multiple sections within the dermis and dermal nerve twigs. The BI was 1+, almost reaching 2+ in some areas. These features suggested that the lesion was that of indeterminate leprosy evolving into BB. Slit-skin smears from other areas of the body, including the skin lesion, were negative for AFB. This patient is presently under multibacillary MDT for 1 year, and his lepromin test now reads 4 mm × 4 mm. A repeat biopsy showed signs of regression, and he is regularly continuing the drugs.

Case 3. A 30-year-old woman presented to the clinic with two anesthetic areas, one on the thigh and the other on the elbow, of 9 months' duration. As before, there was no history of leprosy in the intrafamilial or close contacts. Both lesions were erythematous, indurated, hypoesthetic, and relatively well defined. The lesion on the thigh measured 6 cm × 4 cm; that on the elbow, 8 cm × 4 cm. Cutaneous and other peripheral nerves were not thickened. The rest of the skin surface appeared normal. A provisional clinical diagnosis of BT was made and paucibacillary MDT was given.

A review after a month showed a negative lepromin, and histopathology (H&E) showed mild hyperkeratosis at places in the epidermis and a macrophage granuloma in the dermis. Some macrophages showed foamy changes in the cytoplasm. In addition, variable numbers of lymphocytes and plasma cells were found around clusters of macrophages in the dermis. Acid-fast staining revealed an irregular distribution of bacilli in macrophages, dermal nerves, and arrectores pilorum muscles. The BI in most areas was 3+, and the final impression was that of borderline lepromatous (BL) leprosy. Skin smears from the lesion were 1+ and negative in other areas. The patient was put on multibacillary MDT. Two years later the lesions disappeared, leaving slightly hypoesthetic areas. A repeat lepromin test was 7 mm × 7 mm, and histopathology showed epidermal atrophy, occasional foci of inflammatory cells in the dermal collagen, and no AFB.

DISCUSSION

Following the first report of a remarkably unusual clinical presentation of LL as a single skin lesion ([5]), one of us (RSM; unpublished data) had the opportunity to see and to treat a similar presentation of subpolar LL in an elderly woman whose lesion was a solitary nodule in the lower third of her left forearm near the wrist. The present series show that all three patients with one or two localized skin lesions were mistaken for paucibacillary leprosy and treated accord-

ingly. It was only after their histopathology reports that they were treated as multibacillary leprosy with the three recommended drugs. Slit-skin smears performed 1 month following treatment for leprosy revealed AFB after a careful search in two patients but were negative in one, possibly due to the effect of therapy. All systems of classification ([1]), apart from the number of lesions, also stress the degree of sensory and appendageal loss assessed clinically, both of which are maximal in the tuberculoid end and apparently preserved near the lepromatous end of the leprosy spectrum. However, the difficulty in detecting small differences in sensory loss cannot be overemphasized. At the time the patients in this report were attending the clinic, slit-skin smears for AFB were routinely done in bacilliferous cases and, lately, have been extended to both paucibacillary and multibacillary patients.

The exact pathogenesis of such a presentation is difficult to explain but fortunately, until now, these cases were rare. A recent report of three patients ([2]) describes subpolar LL presenting as a single nodule. After studying the history, site of lesion, and histopathology in these cases, the authors postulated that the mode of infection resembled that seen experimentally in the armadillo, and attributed the lesion to a form of inoculation leproma resulting from trauma which introduced a significantly large dose of viable *Mycobacterium leprae* from the environment into susceptible individuals. This explanation may sound reasonable for single-lesion LL but in borderline leprosy, where some immunological interaction has taken place, researchers should attempt to elucidate the subtle interplay between the local host factors and the virulence of the organisms found in these lesions in experimental animals. This view is also supported by the fact that in two of our patients the lepromin test was initially negative and converted to positive after they had received MDT.

In connection with these unusual presentations, it was a welcome move by the WHO Expert Committee ([3]) to treat all smear-positive cases as multibacillary patients irrespective of their clinical status. This was done as a counter measure to combat drug resistance and, in fact, some of the patients classified as paucibacillary may well have been multibacillary, as seen in this report. In the field, however, where it is difficult to provide histopathological facilities, both medical and paramedical workers should be advised to make proper slit-skin smears from paucibacillary cases, particularly lepromin-negative individuals, if routine performance of this test is feasible, and carefully declare the result so that stray instances are not missed.

SUMMARY

Three patients with solitary skin lesions showing the cardinal signs of leprosy were seen and clinically classified among the paucibacillary cases. Initially, they were treated with two drugs (rifampin and dapsone) as recommended by the WHO Expert Committee. On the first visit of their follow-up, they were seen to be histopathologically either in the borderline (BB) or borderline lepromatous (BL) group, and acid-fast bacilli were demonstrated in the sections. Later they were put on three drugs (rifampin, dapsone and clofazimine) as given for multibacillary cases, and therapeutically they also behaved like bacilliferous leprosy. Such cases are rare and the reasons for the occurrence are not clear. Further studies on the subtle relationship between the local host factors and the virulence of the organisms grown from these lesions may offer an explanation. In light of these cases and previous reports of even lepromatous leprosy presenting as a single skin lesion, field workers—including both medical and paramedical workers—should carefully perform and interpret slit-skin smears from clinically diagnosed paucibacillary cases so that such unusual presentations of the disease are treated appropriately and not missed.

RESUMEN

Se estudiaron 3 pacientes con lesiones solitarias de la piel que mostraban los signos cardinales de la lepra y se clasificaron clínicamente como casos paucibacilares. Los pacientes se trataron inicialmente con dos drogas (rifampina y dapsona), según las recomendaciones del Comité de Expertos de la OMS. En el primer examen de su seguimiento, los pacientes se clasificaron histopatológicamente dentro del grupo intermedio (BB) o intermedio-lepromatoso (BL), encontrándose bacilos

ácido-resistentes en las secciones. Más tarde, los pacientes se trataron con 3 drogas (rifampina, dapsona y clofazimina), como se hace con los casos multibacilíferos. Terapéuticamente, los pacientes también se comportaron como casos bacilíferos. Tales casos son raros y difíciles de explicar. Los estudios más detallados sobre las sutiles relaciones entre los factores locales del huésped y la virulencia de los microorganismos que proliferan en las lesiones podrían ofrecer alguna explicación. Considerando estos casos y las comunicaciones previas sobre casos lepromatosos que presentan lesiones únicas, se recomienda a los médicos y a los paramédicos la preparación, la observación y la interpretación cuidadosa de los extendidos de linfa cutánea de los casos clasificados clinicamente como paucibacilares, para asegurar que tales casos raros de la enfermedad sean detectados y tratados apropiadamente.

RÉSUMÉ

Trois patients avec une lésion cutanée unique et montrant les symptomes cardinaux de la lèpre ont été examinés et classifiés cliniquement comme paucibacillaires. Initialement, ils furent traités avec deux médicaments (rifampicine et dapsone), comme le recommande le Comité d'Experts de l'OMS. A leur première visite de contrôle, ils furent diagnostiqués du point de vue histopathologique comme appartenant soit au groupe borderline (BB) soit au groupe borderline lépromateux, et des bacilles acido-résistants ont été trouvés dans les coupes. On leur a ensuite administré trois médicaments (rifampicine, dapsone et clofazimine), comme indiqué pour les cas multibacillaires, et du point de vue thérapeutique ils se sont également comportés comme des cas de lèpre bacillifère. De tels cas sont rares, et les raisons de leur survenue ne sont pas claires. Des études ultérieures pourraient apporter une explication sur la relation subtile entre les facteurs locaux de l'hôte et la virulence des organismes issus de ces lésions. Au vu de ces cas et de rapports antérieurs de lèpre même lépromateuse avec une seule lésion cutanée, le personnel—y compris médical et paramédical—devrait réaliser et interpréter avec soin les frottis cutanés prélevés chez des malades diagnostiqués cliniquement comme paucibacillaires afin que de telles présentations inhabituelles de la maladie soient correctement traitées et n'échappent pas au diagnostic.

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