Cutaneous Tuberculosis in Three HIV-Infected Patients

SIRI CHIEWCHANVIT, M.D.*,
PONGSAK MAHANUPAB, M.D.**,
PATRICIA F. WALKER, M.D.***

Abstract

Although tuberculosis is a common disease in patients infected with HIV, cutaneous presentation is not commonly found. The authors report three HIV-infected patients with cutaneous tuberculosis and lung involvement. Patient 1 presented with a nodular skin lesion on the right forearm and the diagnosis was confirmed by histopathology and PCR study. Patients 2 and 3 presented with generalized erythematous papules and vesicopustules on the trunk and extremities. Culture grew *M. tuberculosis* in patient 2 and *M. tuberculosis* DNA was detected in the skin lesion of patient 3 by the PCR method.

Key word : Tuberculosis, Cutaneous, Skin, Miliary, Tuberculosis Cutis Miliaris Disseminata, HIV

CHIEWCHANVIT S, MAHANUPAB P, WALKER PF
J Med Assoc Thai 2000; 83: 1550-1554

Mycobacterium infections, especially *M. tuberculosis*, are common among patients with AIDS. Extrapulmonary manifestations are also frequently seen. However, cutaneous tuberculosis has only been occasionally reported[1-10]. We present 3 HIV-positive patients with lung involvement and cutaneous tuberculosis, including a nodule and tuberculosis cutis miliaris disseminata.

CASE REPORTS

Patient 1.

A 25-year-old HIV-positive woman came to the hospital because of tuberculosis of the lung

* Department of Medicine,
** Department of Pathology, Faculty of Medicine, Chiang Mai University, Chiang Mai 50200, Thailand.
*** Ramsey Clinic, 640 Jackson Street, St. Paul, MN 55101-2595, USA.

and lymph node since July 1997. She had been treated with INH, rifampicin, ethambutol and pyrazinamide for 2 months and then lost to follow up. One month later, she came back and was admitted. An erythematous nodule, 2 cms in diameter, at the right forearm was detected. She also had reactive arthritis and AIDS dementia complex. Chest X-ray showed more patchy infiltration at the right upper lung compared to the previous study and diffuse bilateral reticulonodular infiltration. Sputum examination was positive for acid fast bacilli. The skin nodule was excised. The histopathology of the nodule revealed dense infiltration of macrophages, neutrophils and lymphocytes, extravasated red blood cells and vascular proliferation in the deep dermis. Numerous acid fast bacilli were present in the area of inflammation. *Mycobacterium tuberculosis* DNA was demonstrated in the skin specimen by polymerase chain reaction (PCR).

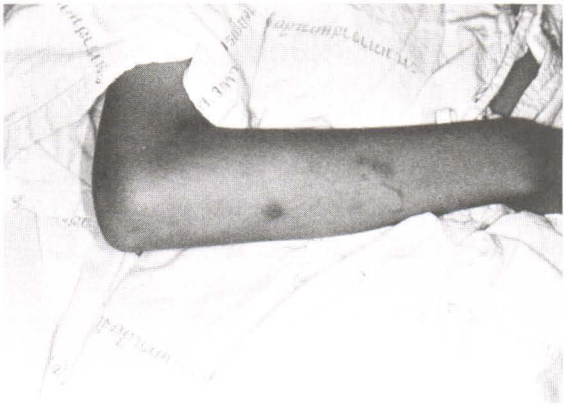

Fig. 1. Erythematous nodule at right forearm (Patient 1).

Patient 2.

A 27-year-old HIV-positive man presented with generalized skin lesions for 2 weeks. He had a history of splenectomy after a traffic accident. Two months prior to this admission he had persistent fever, fatigue, and cough with mucoid sputum. Two weeks before this admission his condition deteriorated rapidly. He developed dyspnea and skin rash. Physical examination showed fever (39°C), respiratory rate of 30/min, moderate pallor and mild jaundice. Crepitations were detected over the left upper lung. Generalized papules, some were necrotic, and pustules were found on the face, neck, upper chest and both arms. CBC showed hemoglobin of 5.4 g per cent, white blood cell count of 4,600/cu.mm. (70% neutrophils, 21% band forms, 1% basophil and 8% lymphocytes), nucleated red blood cell of 4/100 WBC, platelets of 26,000/cu.mm. Liver function tests showed albumin of 1.5 g per cent, globulin of 3.4 g per cent, alkaline phosphatase of 273 U (normal range = 23-98), cholesterol of 73 mg per cent, SGOT 39 U (normal range = 3-35), SGPT 16 U (normal range = 7-33), total bilirubin 10.95 g per cent (normal range = 0.2-1) and direct bilirubin 3.05 g per cent (normal range = 0-0.2). The sputum examination showed numerous acid fast bacilli. A bone marrow biopsy showed tuberculous granuloma with positive acid fast bacilli. Staining of the skin smear taken from a pustule revealed acid fast bacilli. The histopathology of the skin lesion taken from an erythematous papule revealed parakeratosis, neutrophils and lymphocytes in the stratum corneum and focal collections of neutrophils, macrophages and lymphocytes in the dermis. Numerous acid fast bacilli were demonstrated in the area of inflammation. The cultures of the skin and the sputum grew *Mycobacterium tuberculosis*. INH, ethambutol and streptomycin were prescribed. The skin lesions healed completely within 1 month of treatment.

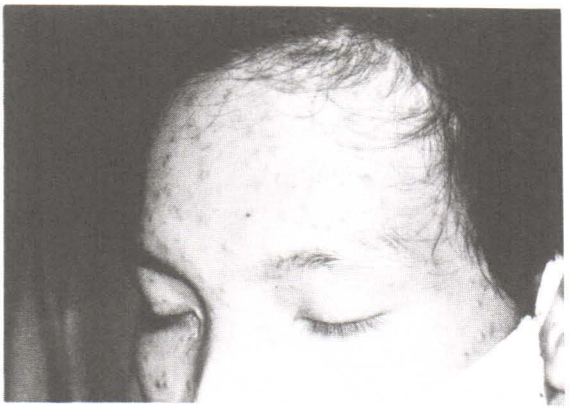

Fig. 2. Generalized erythematous papules and pustules on face (Patient 2).

Patient 3.

A 22-year-old HIV-positive man was admitted to the hospital because of high fever, dyspnea and skin rash for 1 week. He had been treated with cotrimoxazole for pulmonary nocardiosis for 5 months. Physical examination revealed high fever (39°C), respiratory rate of 38/min, hepatomegaly and generalized erythematous papules and vesicopustules on the face, chest and extremities. Chest X-ray revealed left lower lung infiltration, atelectasis and 5-cm masslike infiltration with central cavity in the right upper lung field, and right hilar lymph node enlargement. Sputum collection was not successful. Skin smear showed numerous acid fast bacilli. Skin biopsy showed superficial perivascular infiltrate with histiocytes, neutrophils and lymphocytes. Staining of the skin specimen demonstrated acid fast bacilli in the area of inflammation. *Mycobacterium tuberculosis* DNA was demonstrated in the skin specimen by using the PCR method. Abdominal ultrasonography showed multiple small low echogenicity lesions in the spleen. Rifater 4 tablets/d and ethambutol 600 mg/d were prescribed and stopped after the 2nd day of treatment due to jaundice. The patient died one week after admission.

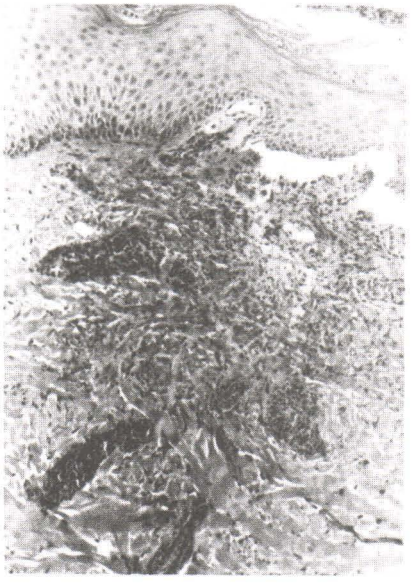

Fig. 3. Focal collection of neutrophils, macrophages and lymphocytes in the upper and deep dermis (Patient 3). (X100)

DISCUSSION

Although tuberculosis is a common disease in patients infected with HIV, cutaneous presentations are not commonly found. These include maculopapules, papules, lichenoid papules, pustules, subcutaneous abscesses, and widespread keratotic papules[1-10]. One of our three patients presented with dermal nodules. The other patients presented with generalized erythematous papules and vesicopustules typical for cutis miliary tuberculosis or tuberculosis cutis miliaris disseminata [1,4,6]. Tuberculosis cutis miliaris disseminata is extremely rare but was found in 2 per cent of tuberculosis patients with HIV infection in one report[4]. To the best of our knowledge, it has been described in about 33 published cases and 14 cases were HIV-seropositive[2,9,10]. It is due to hematogenous dissemination of pulmonary or meningeal tuberculosis to the skin. The cutaneous lesions manifest as red-brown papules (and/or pustules) of 2-3 mm in size, sometimes progressing to vesicles that rupture a few days later, forming crusts. Lesions may occur anywhere on the body and generally number between 20-30[4]. It is usually associated with pulmonary involvement, nonmiliary or miliary pattern with or without mediastinal adenopathy. The reported cases were profoundly immunosuppressed[1,2,4,6,9] and histologically the papules revealed perivascular infiltrates of lymphocytes and neutrophils with focal necrosis and abscess formation[2] or perivascular infiltrates of lymphocytes and histiocytes with poor granuloma formation[1,4]. Acid-fast bacilli are almost always present. The diagnosis can be made by skin biopsy and cultures. The organism may also be isolated from lavage fluid, sputum, stool, urine, bone marrow and lymph node[1,4,6]. Using polymerase chain reaction (PCR) method that amplifies a Mycobacterium-specific gene segment, has been shown to be an efficient and sensitive method for the diagnosis of cutaneous tuberculosis[11-13], mycobacterium tuberculosis DNA was detected from the tissue samples of our patients (Patients 1 and 3).

Since the HIV infection increases the risk for atypical and disseminated tuberculosis, the

AFB stain should be performed in HIV-seropositive patients with nonspecific and nondiagnostic skin lesions. The multidrug-resistant *Mycobacterium tuberculosis* was also found to be more common among these patients with tuberculosis cutis miliaris disseminata and AIDS (4,9,10). Therefore, culture for acid fast bacilli and a drug susceptibility test should be done in every case.

(Received for publication on April 20, 1999)

REFERENCES

1. Inwald D, Nelson M, Cramp M, Francis N, Gazzard B. Cutaneous manifestations of mycobacterial infection in patients with AIDS. Br J Dermatol 1994; 130: 111-4.
2. Libraty DH, Byrd TF. Cutaneous miliary tuberculosis in the AIDS era: case report and review. Clin Infect Dis 1996; 23: 706-10.
3. Nunez M, Miralles ES, Hilara Y, et al. Concurrent cytomegalovirus, *M. tuberculosis* and *M. avium-intracellulare* cutaneous infection in an HIV patient. J Dermatol 1997; 24: 401-4.
4. Antinori S, Galimberti L, Tadini GL, et al. Tuberculosis cutis miliaris disseminata due to multidrug-resistant *Mycobacterium tuberculosis* in AIDS patients. Eur J Clin Microbiol Infect Dis 1995; 14: 911-4
5. Arianayagam AV, Ash S, Jones RR. Lichen scrofulosorum in a patient with AIDS. Clin Exp Dermatol 1994; 19: 74-6.
6. Corbett EL, Crossley I, De Cock KM, Miller RF. Disseminated cutaneous *Mycobacterium tuberculosis* infection in a patient with AIDS. Genitourin Med 1995; 71: 308-10.
7. Berg J, Leonard A, Clancy CJ, Nguyen MH. Subcutaneous abscesses due to *Mycobacterium tuberculosis*: paradoxical expansion of disease during therapy for miliary tuberculosis. Clin Infect Dis 1998; 26: 231-2.
8. Mehlmauer MA. Keratotic papules and nodules and hyperkeratosis of palms and soles in a patient with tuberculosis and AIDS-related complex. J Am Acad Dermatol 1990; 23: 381-5.
9. Esquivel SP, Vigna L, Velazquez J, et al. Disseminated tuberculosis with cutaneous manifestations in AIDS patients. Presentation of 4 cases. Enferm Infecc Microbiol Clin 1998; 16: 31-4.
10. Daikos GL, Uttamchandani RB, Tuda C, et al. Disseminated miliary tuberculosis of the skin in patients with AIDS: report of four cases. Clin Infect Dis 1998; 27: 205-8.
11. Quiros E, Maroto MC, Bettinardi A, Gonzalez I, Piedrola G. Diagnosis of cutaneous tuberculosis in biopsy specimens by PCR and southern blotting. J Clin Pathol 1996; 49: 889-91.
12. Margall N, Baselga E, Coll P, et al. Detection of Mycobacterium tuberculosis complex DNA by the polymerase chain reaction for rapid diagnosis of cutaneous tuberculosis. Br J Dermatol 1996; 135: 231-6.
13. Faizal M, Jimenez G, Burgos C, et al. Diagnosis of cutaneous tuberculosis by polymerase chain reaction using a species-specific gene. Int J Dermatol 1996; 35: 185-8.

วัณโรคผิวหนังในผู้ป่วยติดเชื้อเอ็ชไอวี 3 ราย

สิริ เชี่ยวชาญวิทย์, พ.บ.,*
*พงษ์ศักดิ์ มหานุภาพ, พ.บ.**, Patricia F. Walker, M.D.****

วัณโรคเป็นโรคที่พบบ่อยในผู้ป่วยติดเชื้อเอ็ชไอวีแต่รอยโรคที่ผิวหนังพบได้น้อย ได้รายงานผู้ป่วยติดเชื้อเอ็ชไอวี 3 รายที่มีวัณโรคปอดและผิวหนัง ผู้ป่วยรายที่ 1 มีรอยโรคเป็นตุ่มนูนใต้ผิวหนังบริเวณแขนขวา ให้การวินิจฉัยโดยการตรวจทางพยาธิวิทยาและ PCR สำหรับผู้ป่วยรายที่ 2 และ 3 มีรอยโรคเป็นตุ่มนูนแดง ร่วมกับตุ่มน้ำและตุ่มหนองปน กระจายอยู่ทั่วไปบริเวณลำตัว ใบหน้า และแขนขา รอยโรคของผู้ป่วยรายที่ 2 เพาะเชื้อขึ้น *M. tuberculosis* และผู้ป่วยรายที่ 3 ให้ผลบวกด้วยการตรวจ PCR

คำสำคัญ : วัณโรค, ผิวหนัง, เอ็ชไอวี, เอดส์

สิริ เชี่ยวชาญวิทย์, พงษ์ศักดิ์ มหานุภาพ, Patricia F. Walker
จดหมายเหตุทางแพทย์ ฯ 2543; 83: 1550–1554

* ภาควิชาอายุรศาสตร์, คณะแพทยศาสตร์ มหาวิทยาลัยเชียงใหม่,
** ภาควิชาพยาธิวิทยา, คณะแพทยศาสตร์ มหาวิทยาลัยเชียงใหม่, เชียงใหม่ 50200
*** Ramsey Clinic, 640 Jackson Street, St. Paul, MN 55101-2595, USA