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ORIGINAL ARTICLE

Isolation of mycobacterium and other microorganism from skin infectious in children during Bam earthquake

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ABSTRACT

Background: The Bam earthquake in southeastern Iran turned an ancient city to dust, killing thousands and destroying 80% of all infrastructures. More than 30,000 people died and It left some 100,000 people homeless. Direct contact with polluted water increases the risk of infection, particularly wound infections, cellulitis, dermatitis, conjunctivitis, and ear, nose and throat infections. The prevalence of NTM (non-tuberculosis mycobacteria) is difficult to obtain. The aim of this study was isolation of bacteria and mycobacterial agents, especially atypical species from dermal lesions of children in Bam earthquake.

Materials and methods: In this descriptive study, 88 children settled in camps in 2004 were enrolled. Samples from dermal lesions of children were obtained and transported with middle brook 7H9 and Brain Heart (BH) media to laboratory for isolation of mycobacterial agents and other bacteria. For isolation of mycobacterium, after decontamination and acid-fast staining, they had been cultured in Lewenstein-Jensen medium. Having isolated mycobacteria by differential tests their antibiotic resistance and susceptibility were studied. Meanwhile, other bacteria were identified by staining and culturing in standard media.

Results: The study population included 32 girls and 56 boys. Of 88 samples, 3 mycobacteria were isolated (3.4%) of which 2 were M. chelonae (rapidly growing) and 1 was M. scrofulaceum (slowly growing). The most common isolated bacteria were E.coli (41%) and Coagulase negative staphylococcous (38%).

Conclusion: Infectious disease epidemics may play a role in the post disaster period. Since atypical mycobacteria exist in soil, and some cases were reported from Iran, isolation of these microorganisms is of utmost importance especially in children after a disaster such as earthquake.

Keywords: *Dermal lesion, Mycobacterium, Earthquake.*
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INTRODUCTION

The Bam earthquake in southeastern Iran turned an ancient city to dust, killing thousands and destroying 80% of all infrastructures (1). The earthquake in Bam, killed more than 30,000 people on December 26, 2003. It left some 100,000 people homeless. A study by Connolly MA in 2004, carried out in south Asia earthquake and tsunamis, has considered the majority of deaths following a disaster from communicable diseases, alone or in combination with malnutrition and infections (gastrointestinal, respiratory, cutaneous), and the

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importance of Mycobacteria and HIV pollution was indicated (2).

In a report by WHO in 2004, direct contact with polluted water and food following a disaster could increase the risk of infections, including: wound infections, cellulites, and dermatitis (3). Microorganisms caused infections following tsunamis include: Mycobacteria, staphylococcus, streptococcus, Entrobacteriace group and etc (3).

Mycobacteria are ubiquitous in the environment. Some pathogenic non-tuberculosis mycobacteria (NTM) have been cultured from various environmental sources (such as ground waters, dust and soil), while the environmental source of many others remain unknown. Atypical mycobacterium is probably transmitted by aerosol from soil, dust, water, by ingestion and skin inoculation (4).

Persons with tissue damage (skin trauma, pulmonary disease) and immunodeficiency may be at increased risk of atypical mycobacterial infection (5). The aim of this study was to isolate bacteria and mycobacterial agents, especially atypical species, from dermal lesions of children in Bam's earthquake and to determine their antibiotic susceptibility pattern.

PATIENTS and METHODS

In this descriptive study, 88 children settled in camps in 2004 were enrolled. Samples from dermal lesions of children were obtained and transported with middle brook 7H9 and Brain Heart (BH) media to laboratory for isolation of mycobacterial agents and other bacteria (gram negative and gram positive, cocci and bacilli).

To isolate mycobacterium, after decontamination and acid-fast staining, they had been cultured in Lewenstein-Jensen medium. Having isolated mycobacteria by differential tests such as niacin, nitrate reduction, arylsulfatase, catalase, urease, pyrazinamidase, susceptibility to thiophene-2-carboxylic acid hydrazide (TCH), tween hydrolysis, tellurite reduction, tolerance to 5%NACL, and the rate of growth and pigmentation (dark-light), their antibiotic susceptibility pattern was determined. Other bacteria were identified by staining and culturing in standard media.

Most mycobacteria grow at a relatively slow rate; therefore, the acid-fast smear plays an important role in the early diagnosis of mycobacterial infection.

RESULTS

The study population included 32 girls and 56 boys. Of 88 samples, 3 mycobacteria were isolated (3.4%) of which 2 were M. chelonae (rapidly growing) and 1 was M. scrofulaceum (slowly growing).

Table 1 presents the antibiotic susceptibility pattern of isolated mycobacteria.

Table 1. Antibiotic susceptibility pattern of isolated mycobacteria in sufferers of Bam earthquake

Antibiotic	M.scrofulaceum	M. chelonae	M. chelonae
INH	R	R	R
EMB	R	S	S
RMP	R	R	R
THA	R	S	S
KA	S	S	S
SM	R	R	R

R: Resistant, S: Susceptible, INH: Isoniazid, EMB: Ethambutol, RMP: Rifampin, THA: Thioamides, KA: Kanamycin, SM: Streptomycin

The most common isolated bacteria were E.coli (41%) and Coagulase negative staphylococcous (38%). Other frequent bacteria were: Pseudomonas (4%), Klebsiella (7%), S.areus (7%) and entrococcous (3%).

DISCUSSION

The aim of the present study was to isolate mycobacterial agents, especially atypical species

(NTM) from dermal lesions of children suffered from Bam earthquake.

Totally, 3 mycobacteria were isolated, two of which were M. chelonae and one was M. scrofulaceum. Herrero et al reported 3 cases of cutaneous infections caused by mycobacterium chelonae (5). In Sungkanu study, rapidly growing mycobacterial infections were investigated. Of 20 cases, 17 were M. chelonae/abscessus and 3 were M. fortuitum. They demonstrated that pathology is non-specific and culture is needed for definite diagnosis of NTM (6).

Mahaisavariya et al studied 123 suspected cases of NTM infections. Rapid growers (M. fortuitum-chelonae) were found in 26 cases (65%) and M. marinum was responsible for 12 cases (30%). They found clinical manifestations as clues for diagnosis, however, they revealed that culture is necessary for definite diagnosis (7).

In Bartralot et al study, of 28 samples of cutaneous infections (abscess, necrosis, granuloma) there were 5 M. chelonae, 15 M. marinum, 2 M. kansasii, and one M. terrae, M. gordonae, M. abscessus, M. avium complex, and M. simiae (8).

Escalonilla et al studied 13 patients with cutaneous infection caused by NTM and found M. fortuitum complex in 9, M. avium in 3, and M. marinum in one. In this research, granulomas lesions were investigated and skin biopsy specimens were prepared. The isolates were identified by biochemical testing, but unfortunately, they did not perform antibiotic susceptibility tests (9).

In a study by WU in 2002, 13 cases of M. marinum from skin infections were investigated. This study indicated that culture is necessary for definite diagnosis (10).

In conclusion, infectious disease epidemics may play a role in the post disaster period. These diseases will vary depending on type of disaster, population characteristics, endemic diseases, and climate and geography of the region. Since atypical mycobacteria exist in soil, and some cases were reported from Iran, isolation of these microorganisms is of utmost importance especially in children after a disaster such as earthquake. If proper planning and resources are available and problems quickly identified, morbidity and mortality can be significantly reduced. Aggressive public health measures have prevented the outbreak of disease in other disaster and humanitarian situations. Good personal hygiene and proper handling of food can reduce the incidence of infectious diseases. Vector control, personal protection, insecticides, and draining of standing water help prevent the spread of vector-based diseases. Health education has been shown to reduce the spread of sexually transmitted diseases and HIV.

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