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Antibiotic Therapy of *Brucella* Infected Patients et allied and District Headquarter Hospitals, Faisalabad

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Abstract: Best result in treating the brucellosis is obtained by using the antibiotics in combination. One antibiotic alone is usually associated with a high incidence of relapse. The best regimen for treating brucellosis remain the combination of doxycycline and streptomycin. Moreover, the duration of treatment should be minimum of two months because there is a high incidence of relapse if the duration of treatment is less than 4 weeks.

Key word: Antibiotics, antibodies, brucellosis

Introduction

Brucellosis is a disease of protein manifestation that affects both animals and man. The causative organism of brucellosis are essentially pathogens of animals which may be transmitted to man. All domestic animals and many species of wild animals have been reported to be susceptible (Akram, 1991).

The disease is transmitted to man from infected animal reservoirs through several routes including, ingestion of raw or unpasteurized milk and milk products derived from the infected animals (Batas *et al.*, 1992); animal owners, butchers, veterinarians, individuals who come in contact with the infected animals; dairy farm workers and abattoir workers usually get exposed to the pathogen by contact with the animals uterine content and discharges contaminated floors, utensils, dust etc. Other potential sources of human infection include direct or indirect inoculation; inhalation (Parker and Collier, 1990); through conjunctiva (Williams, 1982); by blood transfusion; by bone marrow transplantation (Naparstek *et al.*, 1982); by transplacental transmission; by sharing needles among drug addicts (Romero-Vivas *et al.*, 1984) and via milk to breast fed infants of infected mothers.

Brucella create a difficulty in antibiotic therapy being an intracellular and a large variety of antibiotics is available against it. So the purpose of this study was to investigate the efficacy of antibiotic therapy.

A total of 282 serum samples from patients having clinical symptoms and signs of brucellosis were collected from Allied and District Headquarter Hospitals, Faisalabad. Each of the sera was analysed first by slide agglutination test (SAT) and only the *Brucella* positive or doubtful sera were further analysed by standard tube agglutination test (STAT). Antibiotic treatment of patients was recorded at the time of blood collection. Serum samples were again collected after the completion of treatment period and analyzed for the presence or absence of *Brucella* organisms. Immuno-fibrile antigens containing *B. abortus* and *B. melitensis* made of immunostics, Inc. USA were used in the test.

For SAT one drop of serum was placed on a clean glass slide. A drop of the antigen was added and thoroughly mixed. The mixture on slide was examined for evidence of agglutination. The results were recorded 2.3 minutes after mixing the test antigens. Known positive and negative sera were used as controls (Browne, 1974). For STAT serial two-fold dilutions of the test serum starting from 1:10 upto 1:640 (volume 0.5 ml) were prepared in phenol saline (0.85% NaCl solution containing 0.5% phenol). The antigens were diluted and an equal amount was added to each tube. Contents of the tubes were mixed thoroughly and incubated at 37°C for 48 hours. The degree of agglutination was determined by the degree of clearing without shaking the tubes. Known negative and positive sera were used as control (Stemshorn *et al.*, 1985). Complete

agglutination and sedimentation with 100 percent clear supernatant was marked as four plus (++++), similarly 75, 50 and 25 percent were marked as three, two and one plus, respectively. No agglutination and no clearing was considered as negative. The highest serum dilution showing 50 percent clearing (++) was considered as titre of that serum. A titre of 1:80 or higher was considered as positive for brucellosis (Alton and Jones, 1967). Doxycycline and streptomycin antibiotics in combination were found to be more effective in controlling the disease as compared to other combinations or single antibiotic (Fig. 1). These findings are also

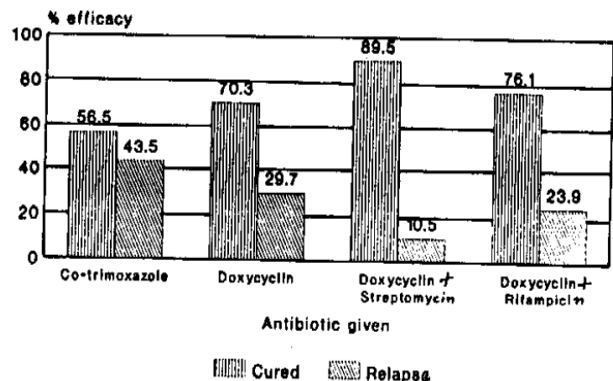


Fig. 1: Comparative efficacy of different antibiotics used in the treatment of Brucellosis

supported by Farrell and Robertson (1980). To avoid relapse it was found that the therapy should be continued for at least two months. The standard serological procedures for the diagnosis of brucellosis since the inception of its serology are SAT and STAT (Sajjad-ur-Rahman *et al.*, 1990). The validity and reliability of these tests has further been confirmed by Stemshorn *et al.* (1985). The use of STAT in order to confirm human brucellosis has been extensively evaluated, yielding the highest degree of reproducibility and accuracy (Buchanan *et al.*, 1974). Antibiotics in combination were found to be more effective as compared to single antibiotic because one antibiotic alone is usually associated with a high relapse of incidence.

Co-trimoxazole alone: Of 23, 13 (57%) patients cured with regimen while in 10 patients (43%) relapse of the disease was seen after a

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period of two months. The only side effects observed were drug eruption in only one patient and urticarial rash in three patients. This finding is in contrast to Hassan *et al.* (1971) and supported by Ariza *et al.* (1985a). The authors reported clinical as well as bacteriological relapse in 37.5 and 46.6 percent patients, respectively.

Doxycycline alone : 19 (72%) out of 27 patients were cured of the disease while 8 (28%) patients showed relapse of symptoms after a period of one month. The major side effects observed were nausea and vomiting in 7 patients, diarrhoea in 4 patients and photosensitivity in one patient only. This is in accordance to Feiz *et al.* (1973) who also reported the relapse rate 30 percent in patients treated with doxycycline alone.

Doxycycline-Rifampicin Verses Dosycyclin-Streptomycin combination

Doxycycline and Rifampicin in combination: With this regimen 32 (77%) out of 42 patients were cured of brucellosis while 10 (23%) patients showed relapse of the disease after one month. The side effects due to doxycycline were again nausea, vomiting and diarrhea in 3 patients only whereas due to rifampicin, the side effects observed were itching in 5 patients, anorexia, nausea and vomiting in 4 patients.

Doxycycline and Streptomycin in combination: This combination was prescribed to 76 patients. Of 76 patients 68 (89%) showed cure and only 8 (11%) patients showed relapse of the disease. The major side effects due to doxycycline observed were nausea, vomiting and diarrhoea in 7 patients and photosensitivity in only 3 patients. The side effects due to streptomycin observed were vertigo and dizziness in 5 patients, pain and local irritation in 17 patients.

These findings are supported by Ariza *et al.* (1985b) who compared the therapeutic efficacy of these two different regimes of treatment. He found that patients in both groups responded well to treatment and there were no therapeutic failures. Relapses were more frequent in those patients who were treated with rifampicin-doxycycline combination (38.8%), compared to only 9 percent in those patients treated with the doxycycline and streptomycin combination.

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