A continuing problem of tetanus in the southeast of Turkey

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Tetanus continues to represent a serious health problem in developing countries [1,2]. Although tetanus is a rare disease in the developed countries [3], it is still common enough to cause concern in Turkey. During the years 1992–3, 75 deaths caused by tetanus were reported from Turkey [4]. Clinical details of 88 adult patients with tetanus who received treatment at our hospital are summarized in this report.

We reviewed the hospital records of all 88 adult patients (>16 years, 56 men, 32 women) with a clinical diagnosis of tetanus managed at the Dicle University Hospital over a 10-year period. Cases were included in this series if they fulfilled the following criteria; a disease the onset of which was characterized by muscle rigidity and hyperreflexia, with a normal conscious state, and which could not be explained on the other grounds, the subsequent course being consistent with tetanus, and there being no history of poisoning with strychnine [5]. The following factors were analyzed: age, sex, immunization status, incubation period, type and location of wounds, presentation symptoms, clinical course, treatment, complications and mortality. The factors that might be expected to influence mortality were compared using the Kruskal–Wallis test. The incubation period is defined as the time between the injury and the onset of clinical symptoms.

Cases were distributed unevenly through the 12 months of the year. The mean age of the patients was 36.5±15.3 years. The majority of tetanus cases occurred in two decades of life: 16–19 years (17 patients) and 40–49 years (24 patients) (Figure 1). The mortality rate was 29% (14/48) in patients under age 40, and 55% (22/40) in patients over age 40, and the difference was statistically significant between the two groups by the chi-squared test ($p<0.05$). The overall mortality was 41% (36 cases: 22 male and 14 female).

The immunization status of 46 (52%) patients was known and only six (7%) of them had received tetanus toxoid recently. Fifty-six patients (64%) sought initial treatment for their wounds, but only eight (9%) of them had received their first active immunization after

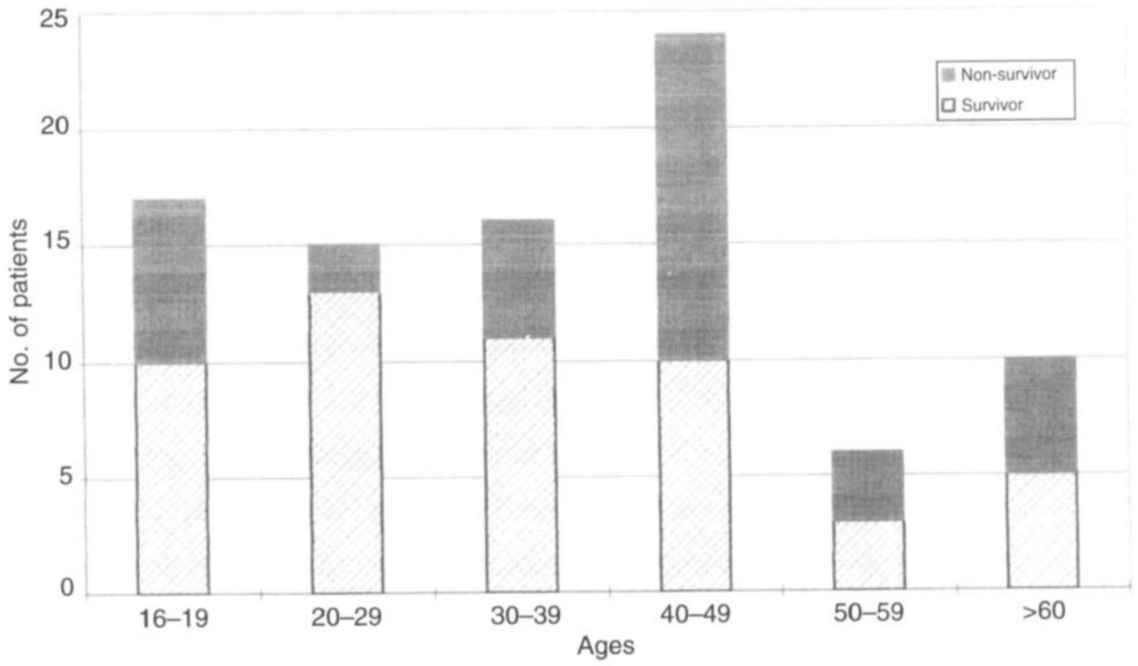

Figure 1 Age distribution and mortality of 88 patients with tetanus.

injury. One of them received passive immunization with equine antiserum. The other 32 patients (36%) sought no medical help for their wounds.

There were 38 patients (43%) in whom the incubation period was 1 week or less. Twenty-two (57%) of them died. Wounds producing tetanus were located on the lower extremity in 27 (31%) patients, upper extremity in 19 (21%), head in 11 (13%), and trunk in nine (10%). The infection occurred postpartum in eight (9%) and postoperatively in six (7%) patients. There was no recognized source in eight patients (9%) and two of these died. Wounds producing tetanus were categorized as severe, moderate or mild. A mild wound was a clean-looking superficial laceration or puncture wound; a moderate wound was any superficial wound exhibiting cellulitis or purulence, and a severe wound was any wound in which necrotic gangrene, crepitation or extension of injury below subcutaneous fat was observed [6].

There were 28 patients with a mild wound, of whom eight died (29%), 20 patients with a moderate wound, of whom 10 died (50%), and 32 patients with a severe wound, of whom 16 died (50%). The mortalities in each category of wound severity were not significantly different ($p>0.05$). The two factors that influenced the mortality rate were age above 40 ($p=0.012$) and infection period shorter than 1 week ($p=0.009$).

The most common first symptom was trismus. Thirty-five patients had neck stiffness, 29 muscle spasm, 22 general rigidity, 17 risus sardonicus, 16 fever, 15 opisthotonos, 12 dysphagia, 10 abdominal wall rigidity and four agitation.

All of the patients received penicillin G and approximately 6000–10 000 units of tetanus immunoglobulin or 50 000–100 000 units of equine antiserum. Local early debridement and removal of exogenous debris were undertaken in 27 patients (31%). Fifty-five patients (62%) received equine antiserum, 33 patients (38%) received human origin antiserum and six patients (7%) received both. The mortality rates in the two groups were not significantly different.

The main complication of tetanus was autonomic instability, which was present in 34 patients (38%); cardiorespiratory arrest occurred in 13 patients and eight of them died. These patients had one or more of the following symptoms of autonomic instability: tachycardia, labile hypertension, sweating, and skin-temperature changes. Pulmonary complications of tetanus occurred in 51 patients, but most of these complications were minor and transient.

Unfortunately, tetanus is still an important problem in Turkey, especially in the southeastern region, because of largely non-immunized populations. Some of the patients in this series neglected to seek medical aid for their wounds. The initial management by general practitioners was often inadequate. Some of the patients had received incomplete tetanus vaccination in early life and this may have had a beneficial effect on the course of the disease [5].

The mean age was not high in this series. The cause of this phenomenon was probably related to the existence of non-immunized children and young in the population. In our patients there was a significant relationship between the patients' age and the mortality rate. During 1985–6, mortality rates in the USA were only 5% in children and adults under 50 years old, but rose to 42% in patients 50 years of age or older [7–9].

In severe tetanus, mortality may reach as high as 60%, even in experienced centers [3,10]. The overall high mortality in our series (41%) may be explained by the absence of prior vaccination or tetanus toxoid administration after wounding, the poor immunization status, the late specific therapy and the inadequacy of the intensive care unit conditions.

Salih Hoşoglu[1], *Celal Ayaz*[1],
Mehmet Faruk Geyik[1],
Yusuf Yagmur[2],
Ömer Faruk Kökoğlu[1]
[1]Department of Infectious Diseases
and Clinical Microbiology,
Dicle University Faculty of Medicine,
Diyarbakır, Turkey;
[2]Department of General Surgery,
Dicle University Faculty of Medicine,
Diyarbakır, Turkey

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Endocarditis in a Dutch patient caused by *Bartonella quintana*

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Spach et al, in 1993, were the first to describe the isolation of *Bartonella quintana* from an HIV-infected patient with endocarditis [1]. Since then, several groups have reported cases of endocarditis in immunocompetent patients caused by *Bartonella quintana* (in the majority of cases), *Bartonella henselae*, or *Bartonella elizabethae* (one case) [2–11]. Diagnosis was based on culture, serologic studies or polymerase chain reaction (PCR) detection. Here we report the detection and identification of *Bartonella quintana* in the aortic valve of a Dutch patient with culture-negative endocarditis.

A 74-year-old man (not homeless or otherwise neglected) was admitted to hospital because of general malaise, weight loss and leukocytosis. A year earlier, he had been bitten by an insect on the ankle, which remained swollen for several weeks. The patient did not own domestic animals. No further abnormalities, especially no heart murmurs, were found on physical examination. In the days following admission, his temperature rose to 39°C and his condition deteriorated. Laboratory investigations showed an erythrocyte sedimentation rate (ESR) of 70 mm/h, hemoglobin 5.7 mmol/L, thrombocytes 179×10^9/L and leukocytes 40.2×10^9/L. Liver function tests and ECG were normal. Bacteriologic cultures of urine, bone marrow and multiple blood samples were negative. Bone marrow examination indicated myeloproliferative activity, without the typical picture of chronic myeloid leukemia. Cytogenetic examination did not reveal a Philadelphia translocation. Serologic tests for *Treponema pallidum* and *Coxiella burnetii* were negative. However, a *Borrelia burgdorferi*-specific immunofluorescence assay (IFA) revealed an antibody titer of 1:1280. Because the general condition of the patient gradually worsened, and because of the positive *Borrelia* serology, empirical intravenous treatment with amoxicillin–clavulanic acid was started. Following this treatment, the condition of the patient improved and the leukocyte count normalized. Antibiotic treatment of the patient was continued using oral amoxicillin 500 mg three times daily for 4 weeks. ESR and leukocyte count reached their lowest levels of 36 mm/h and 9.7×10^9/L, respectively, at 6 months after admission; leukocyte differentiation at that point was normal. Seven months after the first hospitalization, the patient was readmitted to the hospital with complaints of dyspnea and tiredness. At this stage, a heart murmur was heard. A chest X-ray showed cardiomegaly, a pleural effusion and interstitial edema. The leukocyte count had risen to 30.4×10^9/L. Ultrasound examination of the heart showed mitral valve insufficiency and severe aortic valve insufficiency with valvular vegetations, indicating endocarditis. Despite intravenous treatment with ampicillin and gentamicin, the patient developed fever, renal insufficiency, and increasing cardiac failure. He underwent valve replacement and hemodialysis. Microscopic examination of the aortic valve revealed the presence of sclerotic vegetations, but there was no indication of active endocarditis. The patient died 3 weeks after surgery, from septicemia and pulmonary hemorrhage.

Within a 9-month period in 1995, five serum samples were taken from the patient. All sera were tested for the presence of IgG and IgM antibodies against *Bartonella*, in an enzyme-linked immunoassay (EIA) using *Bartonella henselae* (ATCC 49882) and *Bartonella quintana* (90-268) as antigens, and in an IFA using *Bartonella henselae* (ATCC 49882) as antigen (Table 1) [12]. Although the *Borrelia*-specific IFA

Table 1 Serologic results of sera from a patient with *Bartonella quintana* endocarditis

Date	EIA IgG *B. henselae*	EIA IgM *B. henselae*	EIA IgG *B. quintana*	EIA IgM *B. quintana*	IFA IgG *B. henselae*	IFA IgM *B. henselae*
22/03/95	73600	200	19000	288	NT	32–64
30/03/95	61700	200	17100	273	NT	32–64
03/11/95	80300	218	17800	370	NT	>=128
13/11/95	82500	200	16300	323	NT	>=128
04/12/95	103400	200	19500	206	>=256	32

NT, titer could not be determined because of high background.