

## ORIGINAL ARTICLE

# CURRENT STATUS OF TETANUS IN IRAN

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**Objective** – To assess the status of tetanus during the last 20 years in Fars Province, Iran.

**Methods** – Analysis of the hospital records of all tetanus patients who were admitted to the two university hospitals from 1978 through 1997.

**Results** – There were 244 cases of tetanus, the youngest was a 2-day-old male infant and the oldest was an 80-year-old man. There were 176 males and 68 females, with a male-to-female ratio of 2.5:1. Neonates numbered 94, children 24, and the remaining 126 cases were adults. The latter group included 21 postpartum cases.

**Conclusion** – The number of detected cases per 10<sup>5</sup> population residing in Fars Province was 1.8 in 1978, 0.31 in 1987 and 0.02 in 1997, revealing a sharp decline in incidence from the late 1970s to late 1990s. This is likely due to an advancement of the knowledge of the general population, availability of a larger number of medical care facilities, particularly for pregnant women, training of a larger number of rural midwives and general practitioners, and obligatory vaccination programs for preschool children, pregnant women, soldiers and the general public over the last several years.

**Keywords** • changing status • neonatal • postpartum • tetanus

### Introduction

Tetanus is a disease of antiquity and well known to the ancient civilized world.<sup>1</sup> Although its incidence is declining in western countries,<sup>2,3</sup> it still continues to be a major public health problem and a cause of substantial mortality and morbidity in developing countries.<sup>3-5</sup> Neonatal tetanus, in particular, is among the leading causes of childhood mortality in many parts of the world.<sup>3-5</sup> Our experience with tetanus in this region<sup>6-10</sup> has shown a trend towards a progressive decline in the number of afflicted cases in recent years. This encouraged us to reassess the status of tetanus in this area and to evaluate the total number of reported cases in Fars Province, Iran, from 1978 to 1997.

### Patients and Methods

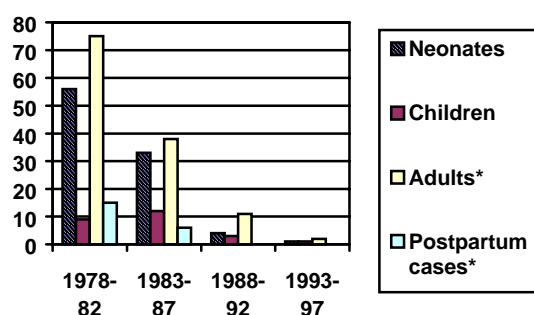
The medical records of all patients with tetanus who were admitted to the two main university

teaching hospitals from 1978 through 1997 were studied. Patients were categorized into three groups: neonates, children and adults. The latter group included 21 postpartum cases. The demographic data in each category and the total number of patients admitted each year were determined. In addition, to assess the impact of some of the ongoing health programs on the number of admitted cases, cross-sectional data were obtained, whenever available, for the total number of population residing in the province, the number of health centers in the rural and urban areas, and vaccination trends particularly among pregnant women and children, in the years 1978, 1987 and 1997.

### Results

Overall, 244 consecutive cases of tetanus were encountered over a 20-year period (1978 – 1997). The youngest was a 2-day-old boy and the oldest was an 80-year-old man. There were 176 males and 68 females with a male-to-female ratio of 2.5 : 1. Of the entire group, 94 were neonates, 24 were

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**Figure 1.** Number of tetanus cases encountered in various age groups from 1978 through 1997.

\*Adult cases include the postpartum patients as well.

children and the remaining 126 patients were adults. The latter group included 21 postpartum women (Figure 1). The number of detected cases of tetanus per  $10^5$  population residing in Fars Province during the years 1978, 1987 and 1997 were 37, 10 and 1, respectively. The incidence (number of cases per  $10^5$  population) was highest during the late 1970s (1.8) and early 80s (0.31), with a sharp decline thereafter until the late 90s (0.02). The number of health facilities is shown in Table 1.

## Discussion

Tetanus, a completely preventable disease, was endemic in Iran and was the cause of many deaths in the past.<sup>11,12</sup> Fars Province was no exception.<sup>13</sup>

Our university hospitals are the sole referral centers for the intensive care management of tetanus patients and other critically ill patients in the area.<sup>6-10</sup>

None of our patients had been immunized ever

**Table 1.** Number of health facilities in Fars Province during the period 1978 through 1997.

Health facilities (year)	1978	1987	1997
Health house	258	533	865
Rural health and treatment centers	89	128	149
Urban health and treatment centers	54	80	111
Township healthcenter	None	10	16
Delivery facility centers	None	None	32
Number of hospitals in province	32	41	47

against tetanus, which shows the importance of adequate routine vaccination for prevention of this disease. The incidence of this disease was highest during the period 1978 through 1984. An almost similar pattern was observed across the entire country.<sup>14</sup> Meanwhile, the country was involved in the Iran-Iraq war and tetanus was an expected complication of war injuries. The successful experience with vaccination of soldiers against tetanus during World Wars I and II,<sup>15</sup> mandated obligatory immunization of all the troops prior to their dispatch to the fronts. In addition, the need for routine immunization, especially for pregnant women, was obvious. The expanded program on immunization for the entire country was initiated in 1984. At that time, a nationwide survey<sup>14</sup> was conducted, which showed that only about 3% to 5% of women of childbearing age had received adequate vaccination against tetanus. Successful elimination of neonatal tetanus requires protection of more than 80% of the infants at birth, through complete vaccination of their mothers and by clean deliveries and cord-care practices.<sup>16</sup> In 1987, only 9% of pregnant women had received TT2+ through the vaccination programs; therefore a more aggressive elimination program was initiated by the Ministry of Health and Medical Education in 1988, targeting all pregnant women through routine vaccination and implementation of official educational programs to change the traditional birth attendants to adequately trained rural midwives, familiar with clean deliveries.<sup>14</sup> In addition, the target aim was expanded from expectant women to an obligatory, pre-marriage vaccination of all young females.<sup>14</sup>

The current governmental medical care facilities in the country include: "Health Houses" (HHs), which are governed by local health personnel and deal with vaccination and health issues of a village or a group of neighboring villages; "Rural Health Centers" (RHC), in which a physician and trained staff care for the patients referred from several HHs; "Urban Health Centers" (UHCs), which give outpatient care to about 12,000 people within a town and have the privilege of referring patients to hospitals if needed; and "Township Health Centers" (THCs), which are covered by well-trained physicians and their crews with adequate experience in planning and evaluating the health programs in each region. "Delivery Facility Centers" (DCFs) have joined this network only recently and serve pregnant

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women, as well as newborn infants and their mothers, providing vaccination, clean deliveries and cord-care practices.<sup>14</sup>

The increase in the number of rural and urban health centers, training of a larger number of midwives and general practitioners, enhancement of the educational programs through the mass media and encouragement of people for active participation in the vaccination programs by health officials and local religious leaders resulted in far better achievements, so that by 1991 about 75% to 80% of children were vaccinated, and 62% of pregnant women had TT2+ vaccination in Fars Province. Similar figures were obtained in other provinces as well.<sup>14</sup>

Similarly effective strategies have been reported from other countries too.<sup>2,17,18</sup> Mansour et al have reported an 80% annual reduction in the number of their reported neonatal cases in Egypt following the initiation of tetanus elimination campaigns since 1988.<sup>17</sup>

There is, no doubt, that these activities can save many lives each year<sup>19</sup> and, therefore, should be continued. Our own observations indicate a progressive and fortunate decline in the number of detected cases in this area, especially during the period 1992 – 1997. However, it should not be forgotten that unreported or undetected cases are still present and we are far from the ideal situation of elimination of the disease, which will require a relentless nationwide effort for proper mass immunization.

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