SEVERE TETANUS SUCCESSFULLY TREATED WITH HIGH DOSE DIAZEPAM (VALIUM) AND PROPRANOLOL — A CASE REPORT

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SYNOPSIS

A case of severe tetanus successfully treated is described. High dose Diazepam (400 mg./day) was used to control convulsions, intramuscular propranolol to suppress sympathetic overactivity, and a combination of Gentamicin and Carbenicillin to combat a severe Pseudomonas infection.

INTRODUCTION

The clinical management of tetanus poses a difficult therapeutic problem to physicians everywhere and this is especially so in the less developed regions in Africa and Asia. The mortality rate varies inversely with the standard of care, the age of the patient, and the incubation period. In areas where proper anaesthetic facilities are not available or inadequate, the control of repeated spasms poses a major problem. Other facets like proper ventilation, adequate fluid balance and nutrition, control of secondary infection, and suppression of overactivity of the sympathetic nervous system are equally important (Kerr *et al*, 1968). Weinberg (1964) first reported on the use of Diazepam (Valium) in the control of repeated spasms in tetanus. Since then sporadic reports have appeared in the literature on the efficacy of the drug (Hendrickse and Sherman, 1965; Femi-Pearse and Fleming, 1965; Kazim, 1965; Shershin and Katz, 1964).

Recently, we had an opportunity to treat such a patient and present below our experience using Valium as the main anti-convulsant drug.

CASE HISTORY

J.M.T., an 18-year old Malay boy was admitted to the Medical Unit, Thomson Road General Hospital, on 30.8.71 with classical symptoms of severe tetanus. The incubation period was about one week and onset time—the time interval between the appearance of first symptoms and generalized spasms—less than 24 hours. This places the case in the severe category and mortality rate as high as 80% has been reported (Oswald, 1961). Physical examination revealed a fairly well nourished male with a sardonic grin, severe trismus, marked opisthotonus, and generalised continuous muscular rigidity. Spontaneous reflex muscular spasms were being triggered by minimal exogenous stimuli. He was sweating profusely, had a pulse rate of 120/min. but the blood pressure was normal. Respiration was regular, rapid, and shallow. X-ray chest was normal. An E.C.G. showed sinus tachycardia.

TREATMENT

He was initially treated with phenobarbitone 60 mgm. 6 hourly, chlorpromazine 50 mgm. 6 hourly and diazepam 10 mgm. 6 hourly. When it became apparent that his spasms could not be controlled with the above regime, it was decided to increase the dosage of Diazepam. At one stage it was necessary to exhibit a total of 400 mgm. of Diazepam per 24 hours, in order to control the spasms (*see* Fig. 1).

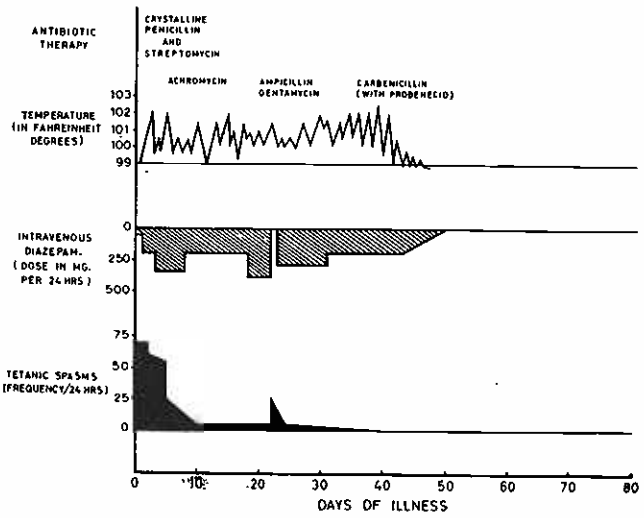

Fig. 1.

3 days after admission, patient was noticed to be sweating profusely and had a tachycardia of 120/min. The possibility of sympathetic overactivity was considered in view of a recent paper by Kerr *et al*

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(1968). Parenteral propranolol (Inderal) 10 mgm. q.d.s. was exhibited. Within two days the pulse rate dropped to 90/min. and the sweating ceased. There was no hypotensive episodes. Although it is not possible to attribute this improvement to propranolol alone in view of the multiplicity of drugs given, we felt this is worthy of record. This drug was stopped after a week.

In addition a prophylactic tracheostomy was performed, and assisted respiration was effected by the Bennett PR 2 Respirator. Penicillin and streptomycin were given intramuscularly. He was fed intravenously with glucose-saline solutions, and his serum electrolytes, blood gases, blood urea, and liver function tests were monitored frequently. A blood volume estimation using the Volemetron and RIHSA-125 was also carried out. This was normal.

CLINICAL COURSE

A summary of his clinical course and response to Diazepam is shown in the accompanying diagram. A pertinent point is the development of a severe Pseudomonas infection. Although blood cultures failed to grow this particular organism, Pseudomonas was grown from his sputum, urine, tracheostomy wound, intravenous catheter, and bed-sores, which unfortunately developed towards the latter part of his illness. Gentamicin alone failed to bring down the temperature (Barber and Waterworth, 1966). In view of recent reports on the combined use of this drug and Carbenicillin (Pyopen), the latter was introduced in a dosage of 5 gms. 6 hourly together with probenecid (Schimpff *et al*, 1971; Jacoby, 1971). Within several days, his temperature began to subside and repeat cultures were sterile after a two-week course of Carbenicillin therapy.

Intravenous Diazepam was completely withdrawn about 50 days after admission. An earlier attempt to reduce the intravenous dose and replace it with oral tablets resulted in recurrence of the fits. Patient's general condition at present is satisfactory and he is completely mobile. He is receiving treatment for his bed sores and undergoing active physiotherapy and occupational therapy.

DISCUSSION

One of the main goals of any tetanus therapy is the easy control of central nervous manifestations, especially reflex spasm, spasticity and anxiety. This is particularly difficult to achieve in areas where curarization and controlled ventilation cannot be carried out adequately. The doses of the available sedatives and central muscle relaxants necessary to keep the rigidity and convulsions under control in severe cases of tetanus are frequently so tremendously high that toxicity can or even must become a problem.

Diazepam ("Valium", Roche) became available for general use in 1963. Although its mode of action has not been completely elucidated, a number of conclusions have been put forward by different authors. This aspect has been well reviewed by Herrero in 1966. It has a wide therapeutic range of safety and daily doses varying from 30 mgm. to 400 mgm. have been found to be safe (Dureux *et al*, 1966). The drug also compares favourably with Chlordiazepoxide (Librium) in its tranquilizing and anticonvulsant effects (Randall *et al*, 1961). Side effects have been reported, but none yet has been alarming (Femi-Pearse, 1966; Herrero, 1966).

From our limited experience it would appear that this drug has a valuable role to play in controlling spasms and anxiety. There was a singular lack of toxic effects in spite of high dosage and there was no depression of any vital function. We were also favourably impressed by the effect of propranolol in controlling the sweating and tachycardia. Perhaps this drug should be more widely used in severe cases where there is evidence of overactivity of the sympathetic nervous system.

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