

Tetanus Eight Days After Administration of Anti-tetanus Serum

The following case, in which tetanus occurred after the prophylactic subcutaneous injection of 1,500 units of anti-tetanus serum, may be found of interest.

CASE REPORT

After an injury in 1952 a young married woman received an injection of anti-tetanus serum, but did not subsequently receive active immunization with toxoid. Nearly three years later she was admitted to the care of an honorary gynaecologist at the Launceston General Hospital with a diagnosis of incomplete septic abortion. She was given 1,500 U.S.A. units of anti-tetanus serum. Eight days later, on waking, she complained of stiffness and aching in the legs. Increased muscle tone was noted in the presence of symmetrical reflexes. Soon she felt her back and neck to be stiff. Shortly trismus and dyspnoea occurred.

The period of onset—that is, from first symptom to first spasm—was only about 10 hours, for in the same afternoon she had six tetanic spasms. 50,000 units of anti-tetanus serum was given intramuscularly without visible reaction. She was taken to the operating-room, and general anaesthesia induced by thiopentone was continued with nitrous oxide and oxygen. During this she received intravenously 100,000 units of anti-tetanus serum. There was an immediate severe bronchospasm, so severe that the anaesthetist was unable to push oxygen into the lungs. Cyanosis became extreme and the heart slowed. In all, the ordinarily excessive total of 2 ml. of 1:1,000 adrenaline was required before this reaction was overcome. Later another 0.6 ml. of adrenaline was given when an erythema with urticaria appeared. Curetting was then done, a tracheotomy made, and intravenous gallamine triethiodide started. After operation heavy sedation was given, and she was fed via an intragastric tube. There was no further spasm. The intravenous apparatus was removed after three days and the tracheotomy tube after five days. She was discharged from hospital 19 days after the spasms.

COMMENT

Probable Effects of Previous Horse Serum.—Bigler and Werner (1941) showed that effective protection after a dose of 1,500 units of anti-tetanus serum may last up to three weeks. This refers, however, to the patient who has not already been sensitized to horse serum, and Ackland (1959) has recalled that Sacquepée and Jude as early as 1937 warned that antitoxin given to an animal or person who has had previous serum may result in rapid loss of the antitoxin. This patient had received previous anti-tetanus serum, and developed tetanus only eight days after her second injection of anti-tetanus serum.

Similarities to a Previous Report.—A report similar in two respects to that above was made by Littlewood, Mant, and Wright (1954). They reported the case of a schoolboy who injured his hand while experimenting with a home-made bomb. He received 1,500 units of anti-tetanus serum, penicillin, and appropriate surgical treatment, including skin grafting. About six months later he was readmitted with similar injuries caused by the explosion of another home-made bomb. He again received 1,500 units of anti-tetanus serum, penicillin, and surgical treatment, including another graft. On the twelfth day he developed trismus and stiffness of the erector spinae muscles. Desensitization was attempted, and, when thought complete, 0.1 ml. of horse serum was given intravenously. This produced a severe generalized

reaction. Eventually 100,000 units of horse serum was given intravenously, but the signs of tetanus increased in severity and the boy died 17 days after his injury.

Wright (1958) proposes that the reason for the failure of the second injection of anti-tetanus serum was that this serum, six months before, had induced a sensitization with consequent accelerated destruction of the specific horse globulin. The woman now reported had also had previous anti-tetanus serum, and, like the boy, had a generalized reaction after receiving anti-tetanus serum intravenously, the route of administration long known to be the most dangerous in this respect (Bruce, 1920). A second very disturbing feature common to both is the development of tetanus within 12 days of a second dose of anti-tetanus serum, and it may be that Wright's explanation applies to the woman now reported. However, experiments recently carried out in Melbourne on the level of anti-tetanus serum in man after injection of 1,500 units did not show any significant difference in antitoxin levels between normal and sensitized individuals (S. D. Rubbo and J. C. Suri, 1960, unpublished work).

Active Immunization after Recovery from Tetanus.—Several writers heed the experience of Martin and McDowell (1954), who reported a second attack of tetanus in the same person. Another example of recurrent tetanus was reported by Beare (1953). Cooke and Jones (1943) state that a demonstrable antitoxin does not persist in the blood after recovery. In four children with clinical tetanus they found that antitoxins failed to appear: the amount of toxin absorbed during a tetanus infection was so small as to produce no primary antigenic stimulus. Hence it appears that an attack of tetanus does not confer immunity. Accordingly the patient above reported was advised to obtain active immunization with tetanus toxoid.

Double Active Immunization to Follow Horse Serum.—Littlewood *et al.* (1954) urged that anyone who has received horse serum should be actively immunized not only against tetanus but also against diphtheria. Diphtheria antitoxin, like tetanus antitoxin, is produced in horses, and a second injection of this animal's protein may result in its very rapid elimination from the body, thus running the risk of greatly shortening the duration of passive immunity (Wright, 1958). It appears desirable, even if only to prevent reactions to horse serum, that those who have received horse serum should have the Schick test, and the susceptible should then have the Moloney test and be considered for active immunization with diphtheria toxoid.

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The Communicable Disease Center, Georgia, U.S.A., has issued a complete list of films available from its film library as on June 1, 1960. Details are available from the Center, Atlanta 22, Georgia, U.S.A. (attention Audiovisual).