THE EFFECTS OF DIPHTHERIA TOXOID ON PAINFUL ENLARGED NERVES IN LEPROSY

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Soon after the use of diphtheria toxoid in the treatment of leprosy was begun at this institution, a number of patients presented themselves complaining of severe pain along the course and distribution of the ulnar and median nerves. As an experiment, each was given injections of diphtheria toxoid, beginning with 1 cc. and increasing every two weeks by 0.5 cc. The results were immediate and striking, as the following case reports will show.

Case 1 (1186)—Nai Oon, a male Thai (Siamese), aged 35, admitted April 17, 1939. Type of leprosy, N1. Father leprous. Patient had had symptoms for 1½ years prior to admission. Complaint of numbness of both feet and a penetrating ulcer of the sole of right foot. Red wrinkled patches on right arm. Prognosis on admission, doubtful. Laboratory findings: Urine, acid, sp. gr. 1012, free from albumen and sugar; feces, round worm ova; blood, red cells 4,100,000, white cells 6,000, hemoglobin 70 percent; Kahn test negative. Bacilli: skin, negative; nasal smear, positive.

Reexamination, November 13, 1939: Ulcer of foot has healed. Patient complains of pain and numbness of both hands. Beginning deformity of both hands, particularly in the distribution of the ulnar nerve. Both ulnars greatly enlarged; incision of the capsule of the nerve for relief of tension recommended. Laboratory findings essentially as before, except that skin, ears and nose are negative.

The following notations have been taken from the clinical record. On June 29, August 30 and November 10 the patient complained of pain and numbness of both hands; treated with salicylates and aspirin. On November 15, after several sleepless nights, he agreed to operation, but as the surgeon was out of town it was postponed. On November 25 the nerve measured 2 cm. across, just above the elbow, and was very painful to touch. It was decided to try toxoid treatment instead of operation.

On November 25, 1 cc. of toxoid was given subcutaneously. November 27: Patient reports relief of pain, but increased tingling in the fingers. December 4: Patient feels very much better. Nerve now measures 1 cm. across. December 9: Patient free from pain. Nerve, though still palpable, is not markedly enlarged. Toxoid again given, 1 cc. December 23: Right ulnar now barely palpable; left ulnar slightly larger, but hardly larger than normal. Both arms free from pain, hands stronger. January 15, 1940: No pain. Toxoid 2 cc.

At the semiannual examination, on February 28, no evidence of activity of the disease was found. Smears from the nose, skin and ears were all negative. The erythrocyte sedimentation rate was 8. In the following month the patient was adjudged symptom-free, and he was discharged as such on May 22.

CASE 2 (1208)—Nai Bang, a male of Thai nationality, aged 34, admitted July 3, 1939. Type, L2. Duration of the disease, 10 years. On admission there was diffuse infiltration over the entire body; wasting of muscles of right hand; slight anesthesia of leg and along the ulnar distribution. Prognosis questionable. Laboratory findings: Urine negative for sugar and albumin; feces negative for parasitic ova; blood, red cells 3,560,000, white cells 8,600, hemoglobin 60 percent; Kahn test negative. Bacilli: Skin, 2+; nose, 1+; ears, 2+.

On November 25, 1939, the ulnar nerves were very much enlarged and very tender. There was considerable numbness and tingling. Toxoid, 1 cc., was given hypodermically. November 27: Pain considerably relieved, numbness and tingling gone. December 5: Ulnars barely palpable. December 9: Toxoid, 1 cc., repeated. December 13: Pain gone from both arms. December 23: Ulnars still palpable, but not painful.

On March 25, 1940, there had been no further complaints regarding the ulnars. Activity of the lesions of the face was much reduced, and there had been general improvement. Nasal smears were now negative, and the bacilli in the skin were reduced from 2+ to 1+.

CASE 3 (473)—Nai Bow, a male Thai, aged 28, admitted September 26, 1939. Type, L2. Father was leprous, and the patient had suffered for 13 years. Condition on admission: Lepromatous infiltration of ears, face and trunk; wasting of muscles of hand, with deformities; slight paralysis of left side of face, including eye lids. Prognosis bad. Laboratory findings: Urine alkaline, sp. gr. 1014, negative for sugar and albumin; feces, ova of taenia saginata and of clonorchis; blood, red cells 3,880,000, white cells 8,400, hemoglobin 65 percent; Kahn test, 3+; erythrocyte sedimentation rate, 51.5 Bacilli: Skin, 2+; ears, 1+; nose, negative.

The following notations are taken from the clinical record. November 18: Patient complains of severe pain of both median nerves, which are markedly enlarged. November 25: Condition persists. Toxoid, 1 cc., given hypodermically. December 4: No reaction followed the toxoid injection. Medians still tender. December 9: Toxoid, 1 cc. December 11: Pain entirely relieved. December 23: Pain of median and ulnar nerves entirely gone. December 30: Toxoid, 1.5 cc. January 17, 1940: Slight tingling, but no pain in ulnars or medians.

To August 1, 1940, the patient has made no further complaint regarding the ulnar or median nerves, saying that he has been completely free from pain or discomfort. There has been no further activity of the leprous lesions of the face or body. The general condition is considerably improved.

CASE 4 (1148)—Nai Bee, a male Thai, aged 30, admitted December 27, 1938. Type, N3. Duration of the disease, 15 years. The patient came a considerable distance (200 miles), largely on account of intense and persistent pain in both arms. There was wasting of the muscles of both hands. Diagnosed as an old tuberculoid case, of good prognosis. Laboratory findings: Urine alkaline, albumin 2+; feces negative; blood, red cells 4,900,000, white cells 8,500, hemoglobin 80 percent; Kahn test negative. Bacilli: Skin, negative; nose, positive.

After a number of remedies for relief of nerve pain had been given without success, 1 cc. of toxoid was administered on November 25, 1939. Previously the ulnars were so painful that the patient could not sleep. There was no local or general reaction from the toxoid. November 27: Relief of pain from the ulnars at elbow. Numbness and tingling of finger tips since the injection. December 5: Ulnars barely palpable. No pain even on massaging.

Toxoid was continued at 14-day intervals. December 11: The nerves were barely palpable. January 20, 1940; Patient complained of slight tingling of right hand.

There are no further notations in the record of this patient, and shortly afterwards he left the asylum, completely free from pain or tingling of the hands.

COMMENT

Before diphtheria toxoid was introduced in treatment in the Chiengmai asylum, an average of six patients per month were operated upon for painful nerves. This was done not only to relieve severe, persistent pain, but also in an effort to minimize deformities of the hands and absorption of the bones of the digits. Such operations, though they give relief in the majority of cases, are not entirely successful because occasionally the scar tissue results in further constriction of the nerve.

Since the use of toxoid was begun I have not operated on another case, because in every instance relief of acute pain was obtained without operation. The only case of nerve pain which has not been relieved is a chronic one in a young girl previously operated upon for enlarged ulnars, and presumably the suffering is due to contraction of scar tissue. Frequently the immediate effect of toxoid is to cause hot or itching sensations of the hands and feet. That condition, however, is temporary. In more than 300 cases treated with toxoid in the asylum the results have been satisfactory.

Occasionally patients complain of nerve pains immediately following the administration of toxoid, who have not had that complaint before, but that has always been temporary. Fre-

quently patients have complained of itching over leprous areas of the skin following injections of toxoid, followed by return of sensation in previously anesthetic areas.