# AN EXPERIMENT IN THE TREATMENT OF FILARIAL LYMPHANGITIS BY SUBCUTANEOUS INJECTIONS

F. W. O'Connor

From the Department of Medicine, Columbia University, New York, and the School of Tropical Medicine, San Juan, Porto Rico.

In the course of an address delivered at The School of Tropical Medicine, Porto Rico, on November 7th, 1927, it was stated that the group of symptoms associated with many of the attacks of lymphangitis, and elephantoid fever in Porto Rico, and generally considered filarial, are possibly due to the toxins of one or more adult filarial worms. The opinion was expressed that the parent nematode is probably present in some local area of the affected limb and that in many cases the site is in the distal part of the limb. The victims of lymphangitis and elephantoid fever often complain that in addition to the generalized pain in the inflamed limb during the acute attack, there are one or more localized areas or spots where the pain is more severe than elsewhere and that pain or itching in such acreas occurs more or less constantly in the same situation, either as the premonitory sign of each recurrence of symptoms or during the attack itself. It seems possible that these special areas might indicate the position of the adult-worm or worms. Subsequent studies (2) have tended to increase one's belief in this assumption.

Many workers have endeavored to treat filariasis by intravenous injections with various drugs; but without success. It is possible that the reason for failure to control the activities of the filariæ by some of the drugs used might be due to the fact that a sufficient quantity of the drug, entering the body by the veins, does not reach the environment of the adult worm which is present in the lymphatic or connective tissues and not in the blood vessels, as is the case with the causative parasite in schistosoma infections.

In January, 1929, observations were commenced in Porto Rico to ascertain whether it is possible or not by subcutaneous medication in the affected limb to prevent recurrences and to give relief during attacks of lymphangitis.

## METHOD OF PROCEDURE

Various compounds of arsenic have been used intravenously in the treatment of filariasis, and it seemed desirable to ascertain if they

might be more efficacious if used locally. The compound Sulpharsphenamine was selected because:

1. When injected into the tissues it does not cause a severe toxic reaction and there is no evidence of destruction of tissue.
2. Within limits, it diffuses fairly widely around the point of injection.

Injection of this drug is, however, very painful, and in order to make its use less objectionable it seemed wise to dissolve it in some anaesthetic solution of low toxicity. Novocaine was chosen, and the material for injection prepared thus: 20 centigrams of Sulpharsphenamine is dissolved in 2 cc. of a sterilized 1 per cent solution of novocaine. The mixture is drawn up into a sterilized graduated glass syringe capable of holding the full dosage. At first only one injection was given, but it has since been decided to give three to four injections in the same area at five-day intervals.

### SELECTION OF CASES FOR TREATMENT

1. In order to be able to evaluate results within a reasonable time it was decided to select for treatment only those persons who could give reliable evidence that their attacks of lymphangitis recurred once a month or at shorter intervals. The majority of patients presenting themselves for examination came within this category; so there was no difficulty in finding a suitable number for observation.

2. From the aforementioned persons, only those were selected who could clearly indicate some spot or localized area in the affected limb at which pain or itching either heralded the onset of the attack or rigor, or was especially severe during the inflammatory state. Such information is easily obtainable from intelligent patients. It is much more difficult to acquire from the less educated who sometimes are unable to discriminate degrees of severity of pain with exactness.

3. Only those cases were treated, in which the area indicated for treatment was situated in the distal part of the limb. As pain in the groin glands, femoral or inguinal, is believed in many cases to be a toxic reaction from the real site of infection, it did not seem justifiable to inject in these areas until treatment in the more distal parts of the limb indicated by negative results that the basis of the trouble lay in or around the glands.

4. Most of the cases had been observed during an acute attack of lymphangitis. From 9 of these: 10 cc. of blood had been removed from a vein during the acute attack and cultured in blood broth by Dr. Earl B. McKinley, Prof. of Bacteriology at the School of Trop-

ical Medicine. His reports were negative for bacteria, including hæmolytic streptococci, in the nine cases.

### PREPARATION OF THE PATIENT AND TREATMENT BY INJECTION

It is well known that if patients suffering from lymphangitis or elephantoid fever, believed to be filarial, are placed at rest in bed, they may cease to have inflammatory attacks while they so continue. In consequence, all the cases under consideration were treated as outpatients and were, moreover, instructed to continue their usual employments immediately after receiving the injections.

On arrival at the clinic the patient's limb was cleaned in the area to be treated and tincture of iodine was swabbed on the site chosen for puncture. A fine needle was attached to the syringe containing the drug and the needle was thrust into the area indicated by the patient, as being the local point where the pain started or was most intense at the time of the recurrences. The needle was pressed forward through the skin as far as the underlying fascia. As the drug was injected the point of the needle was turned in several directions and injection was continued as the needle was withdrawn through the skin. On removal of the needle, the point of puncture was swabbed with iodine and a sterilized gauze dressing strapped over the area. Immediately after the injection the patients walked or drove to their homes. Most of the injections were administered by Dr. Jenaro Suárez and Dr. Garry Burke, at the Presbyterian Hospital, San Juan, through the courtesy of the Director of the Hospital, Dr. W. R. Galbreath. These colleagues made follow-up observations on the cases and helped also with valuable advice.

### RESULTS

While thirty-two cases have been treated to date, only twenty have been treated sufficiently long ago to justify any consideration at present. Full accounts will subsequently be published on all cases when sufficient time has elapsed. In the meantime the following summary regarding twenty cases that were treated five and a half to six months ago may be of interest.

Most of the patients stated that the injections were not painful. A few persons of more nervous type complained of slight local discomfort for a few hours on the evening of the injection.

In no case was any inflammatory reaction observed locally; and there was no sign of any constitutional disturbance amongst the twenty cases. Up to date eighteen have had no recurrence. One case had a typical attack of lymphangitis within three weeks. When examined

the patient stated that the relapse began some inches from the area injected, at a spot concerning which he had given no information previously. The second case which relapsed had at the first examination complained of two localized tender areas at the beginning of his attacks. One was below the external malleolus of the leg and the other at a point over the head of the fibula, just below the knee. The injections had been given at the malleolus. During the relapse there was no pain at the malleolus and the lower leg did not become inflamed, as it had done for several years during the attacks. He received a second injection, this time in the skin over the head of the fibula, and since then he has not had a recurrence.

One patient suffered from monthly attacks in each leg. An injection was given in one leg and the other leg was left untreated as a control. There have been no relapses in the treated leg. There have been three recurrences in the untreated limb.

In two cases receiving the injection after the rigor and pain had commenced, fever with headache and inflammation, etc., which had accompanied previous attacks, did not develop.

In two cases treated on the first day of the attack after swelling and redness of the limb were observable, with fever, the temperature became normal by the next morning and the redness disappeared within 24 hours. In both of these cases during previous attacks the duration of fever was three days and the redness five to six days.

Experience with subcutaneous injections of antistreptococci, antiplague, and other serums in Porto Rico has shown that sometimes the patients enjoy freedom from relapses for several months to a year or more following treatment; but that sooner or later the attacks occur again. Therefore, it is too early in the present instance to speculate on the permanency of relief following the use of Sulpharsphenamine. It has been suggested that the relief in the cases under consideration might be due to Novocaine alone, and controls with Novocaine are being tried.

If the attacks of lymphangitis are due to filarial toxin, it is difficult to understand how, if the toxin is excreted in bulk, a drug such as that used can modify symptoms which have already commenced. It is possible, however, that the toxin is excreted gradually and that damage to the worm by the drug might materially curtail its excretory power.

## CONCLUSION

The method of treatment described does seem to have some effect in modifying the severity and duration of attacks of lymphangitis believed to be filarial, and of elephantoid fever.

The success of treatment depends on the accuracy with which the physician estimates the localized area where the inflammatory process originates, and in his giving the injections at this site.

While there is hope that subcutaneous injections of Sulpharsphenamine or a more suitable drug given by the method described may give permanent relief and prevent recurrences of filarial lymphangitis and elephantoid fever, no claim is made that such a hope has been realized. It is probable that other drugs may prove even more efficacious.

The object of publishing these observations is to interest other workers in this subject, not so much in the specific drug used, but in a method of procedure which may give better prospects of success than treatment by the intravenous route or by haphazard subcutaneous injections of drugs without consideration of local indications.

BIBLIOGRAPHY

(1) O'Connor, F. W.: (1927) Porto Rico Rev. of Public Health and Trop. Med., **3**: 211.

(2) O'Connor, F. W. and Burke, G. R.: (1929) Am. Jour. Trop. Med., **9**: 143.