THE TREATMENT OF STAPHYLOCOCCAL INFECTIONS BY STANNOXYL—FURUNCULOSIS AND ACNE.

(METHOD OF GREGOIRE AND FROUIN.)

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FROUIN [1], in pursuing his interesting researches on the action in vitro of metals, particularly the rare metals, on different bacteria, has recently been led to investigate the influence of tin and its derivatives on the growth of staphylococci. With Gregoire [2] he has established that this element, its chloride or its oxide, when added to ordinary bouillon culture medium, strongly inhibits the growth under anaerobic conditions of staphylococci; while, under aerobic conditions, the growth of staphylococci is not hindered, but the virulence of the microbe is diminished. That fact, coupled with the observation coming from the district of Beauce that furunculosis is an unknown affection among tin workers of the region, formed for Frouin and Gregoire the starting-point for testing in vivo the therapeutic value of tin in staphylococcal infections. They found that intravenous injection of the chloride or hydroxide of tin in the rabbit, twelve hours after intraperitoneal inoculation of virulent staphylococci, retarded the death of the animal by several days.

As a result of these experiments Gregoire and Frouin have given us for the treatment of lesions of staphylococcal origin the preparation stannoxyl, which is a combination of metallic tin and its oxide, entirely free from lead, a drug which, already in France [3] has given such promising results in the treatment of staphylococcal infections (acne, furunculosis, etc.).

In the present paper I propose giving an account of confirmatory results obtained by me with stannoxyl, kindly placed at my disposal by Monsieur Frouin, in the treatment of seven cases of staphylococcal infection.

These cases group themselves under the following headings:—

(1) FURUNCULOSIS.

Case 1.—Lieutenant W., aged 40. Came to see me July 16, 1917, to have a vaccine prepared for two angry-looking boils on the neck, one situated on the left side about half an inch above the collar, the other on the right side at the level of the collar. Patient was in a very excited condition, feeling, as he put it, that he was “in for a bad time.” Some years previously he had had a very severe attack of boils, which at the time required drastic surgical interference, the scars from which on the neck and scalp were plainly visible. At visit on July 16, 1917, I opened and expressed pus from both boils, the culture from same giving pure growths of Staphylococcus aureus. Boils were swabbed with tincture of iodine, dry dressings—as recommended by Frouin—being applied, and the patient was put at once on stannoxyl internally. After two days’ treatment with stannoxyl the tense feeling complained of in the neck had practically gone and the condition was greatly improved, while two days later condition had quite cleared up. No return two months later. Patient only took in all some twenty tablets (compromises) of stannoxyl.

Case 2.—Drvr. T., aged 26. First seen by me at the laboratory on July 18, 1917, where he was sent to have autogenous vaccine prepared. Three large boils...
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present on neck, one in a particularly active condition, and many little boils beginning to point, besides numerous scars of old boils. Patient said that four months previously at Birmingham he suffered from a troublesome crop of boils, five of which had to be finally opened, drained and packed with antiseptic gauze before they cleared up. Treatment with a stock vaccine had then been tried and failed. Stannoxyl treatment was begun at once (July 18, 1917), the patient being recommended to take four comprimes (one gramme) per day the first day, six the second, and eight on subsequent days, while continuing the ordinary hospital treatment of boracic fomentations twice daily. On July 27, 1917, only two boils active. Injection of 250 million staphylococci (autogenous vaccine) given. A week later (July 27, 1917) boils not so active, but two tense areas amongst old scars suggestive of deep-seated pus which might point at any time; 500 million staphylococci injected (arm). Seen again August 7, 1917; condition considerably improved, patient felt better, leakage from active boils much less; tense swollen areas mentioned had become smaller, felt harder and more shotty; injection of 750 million staphylococci given. After this date vaccine treatment was discontinued, and stannoxyl, with local dressings, solely relied upon. On August 14, 1917, only two little openings from which occasional leakage of pus and lymph. Ten days later (August 24, 1917), patient practically well, only slight leakage from one little opening, all others healed. Within a week this was closed and patient apparently cured. No return of boils since. In all, some 170 comprimes of stannoxyl taken.

Case 3.—Pte. J., aged 23. First seen August 14, 1917. Boils on posterior aspect of both thighs and buttocks around cicatrices of four large “nose-cap” wounds received in France in April, 1917, from which metal had been removed. Present attack six weeks old, beginning with a boil near one of the wounds. On left buttock the remains of some thirty or forty healed boils could be counted. Had also a boil in full activity on external aspect of right elbow. Pus removed from same gave a pure culture of Staphylococcus aureus. About six years ago patient had a severe attack of boils “right over the face, on the arms and legs.” Treatment with stannoxyl begun at once, a box of seventy comprimes being given with instructions to take eight comprimes per day, while continuing the hospital local fomentations and dressings. Seen four days later (August 18, 1917), boils on buttocks greatly improved, but a fresh crop showed evidence of breaking out in region of right elbow. Seen nine days later (August 27, 1917), the elbow condition had entirely cleared up, having apparently never come to anything, the condition on the thighs being much the same. Patient was given a second box of stannoxyl with instructions to continue taking eight comprimes per day. After this the case proceeded normally to complete cure, which was attained three days later. On September 10, 1917, there had been no return of boils. In all, about 100 comprimes of stannoxyl taken.

Case 4.—Pte. S., aged 32. Seen August 16, 1917. An active angry-looking boil situated on the outer aspect of right leg, just below the knee, from which about one cubic centimetre of pus was easily expressed. Another boil in process of healing was situated further down the same leg. Over the left knee was an inflamed area of a commencing boil, while further down same leg on anterior aspect of ankle was a boil in process of healing. Stannoxyl treatment was begun at once, the ordinary hospital carbolic fomentations every three hours not being
interfered with. Seen sixteen days later (September 1, 1917), patient was to all intents and purposes cured; there only remained a little inflammatory spot about half way down outer aspect of right leg, as if a new boil was forming. Patient said this had been so for a few days, and was told to report again if anything came of it. He never did so, hence assumed to have been completely cured. Patient had previously an attack of boils on legs fifteen years ago when in India. Quantity of stannoxyl taken—one box of seventy to eighty comprimes.

Case 5.—J. E., civilian; aged 17½. Subject more or less to boils since the age of 13. Seen September 2, 1917, patient was suffering from a boil on left side of neck about size of fairly large bean. A boric fomentation recommended to clean and soften boil, and on September 4, 1917, a culture was made from the pus. A pure growth of staphylococci was obtained. Internal treatment with stannoxyl begun September 4, 1917, and local dressings of dry boric lint on boil. Five days later condition had entirely cleared up and there was no evidence of fresh boils. Treatment discontinued. In all, twenty comprimes of stannoxyl taken. As drug had a marked constipating effect, only four comprimes were taken per day instead of eight, which patient had been recommended; bowels kept open with salts.

(3) ACNE.

Case 6.—Pte. B., aged 21, laboratory attendant. Very troublesome acne on face since the age of 12. Condition showed weekly periodicity, in that about once a week there appeared a widespread crop of papules all over the face, eventually becoming pustular, which was most distressing. Between August, 1916, and April, 1917, patient had continuous course of treatment with autogenous vaccine (*Staphylococcus aureus*) at more or less weekly intervals, the doses ranging progressively from 50 million to 5,000 million, and that without the least benefit. Vaccine treatment was therefore abandoned, and treatment with stannoxyl begun June 23, 1917, and continued, eight comprimes per day, till August 8, 1917, during which time some 350 comprimes were taken. The condition rapidly improved with stannoxyl treatment, but between July 8, 1917, and July 14, 1917, patient visited his home in Yorkshire "on leave," and while there he had a more or less full-blown attack. On account of this, on his return I continued him on treatment much longer than appeared necessary after his condition had again cleared up. For a month after treatment was suspended on August 6, 1917; there was no return of the weekly attacks, but occasionally a papule would appear on the forehead, which quickly disappeared, the rest of the face remaining quite clear. Owing to the return of some six papules on the forehead, cheeks and neck, on September 26, 1917, patient was again put on stannoxyl, six comprimes per day. Anew there was an immediate response to treatment; inside a few days condition quite cleared up. This patient’s condition being now so perfectly under control by stannoxyl treatment, it is hoped by successive courses of the drug to eventually completely cure him of his complaint. Up to the present patient has taken in all 410 comprimes, about 100 grammes of stannoxyl.

(3) INFECTIVE DERMATITIS (OTHERWISE UNDIAGNOSED).

Case 7.—Pte. D., aged 27. Seen on August 20, 1917, being sent to laboratory for the preparation of autogenous Vaccine. Purplish pustular eruption on extensor and flexor aspect of forearms, on back of left hand, on the neck, and a
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A nodule on upper lip. Condition began six weeks ago while engaged on farm work. A Gram-negative diplococcus and a Gram-positive diphtheroid bacillus isolated on culture, but no staphylococci were found. Seen again a week later (August 27, 1917), when a fresh culture was made from eruption on flexor aspect of forearm in order to confirm above finding in regard to diphtheroid organism in view of preparing vaccine. Culture revealed presence of same diphtheroid bacillus, also of staphylococci. At this visit, in the absence of staphylococci being found in the first culture, the case was considered more suitable for autogenous vaccine, prepared with above diphtheroid organism, than for stannoxyl. However, during next few days, while vaccine was being prepared, the patient was put on treatment with stannoxyl, eight tablets per day being taken. When seen five days later (September 1, 1917), condition very much improved. Stannoxyl therefore was continued, and vaccine treatment abandoned. Patient went 'on leave' from September 3, 1917, till September 10, 1917, and was not seen again by me till September 14, 1917. Then patches on forearms were quite healed, and nodule on lip gone, with new skin of a faintly purplish colour formed, where latter had been, but two small fresh pustules were present on left wrist, which patient thought might develop. Not having taken any stannoxyl for four days, enough was given to him for five or six days' further treatment. Culture from pustules on wrist showed presence of staphylococci, but no diphtheroid organism found. Seen again September 21, 1917; condition cured and there has been no return since. In all, patient took some 140 tablets of stannoxyl, and during treatment he was obliged to take salts (MgSO₄) every other night to keep bowels open.

That stannoxyl appears, therefore, to afford a sure and efficient method of general treatment for such staphylococcal infections as furunculosis and acne, would seem to be proved by the above cases, confirming as they do the results already obtained in France by Frouin and his co-workers.

The rapidity with which, in these diseases, the infection comes under control is suggestive that, here at least, there is in the metal a curative agent at work, acting probably as in the corresponding anaerobic in vitro experiment of Frouin and Gregoire (loc. cit.), in which case it would be by producing a soil unfavourable for the growth of staphylococci. Its effect on the growth of staphylococci under aerobic conditions in vivo I propose shortly to deal with, in a further paper on the treatment of the "mixed infection" of pulmonary tuberculosis by stannoxyl.

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REFERENCES.

