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## ANTIMONY IN THE TREATMENT OF LEPROSY

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Antimony is one of the many drugs which has been advocated in the treatment of leprosy. In the Pretoria Leper Institution we find it useful in various types of cases. We agree with Muir (1) that it has "the power of controlling the condition of lepra reaction," and we use it as a routine for erythema nodosum leproticum. Incidentally we are also using insulin for this condition as recommended by Pogge and Ross (2), but have not yet decided which is the better line of treatment.

Apart from its effect on the "lepra reaction," antimony can be used as an adjuvant or as a substitute for other treatments. We find it indicated in tuberculoid cases, more particularly of course when they are in the reactive phase, and also in neural cases that have a lowered resistance and are developing new maculae. In the lepromatous cases it occasionally seems to have a beneficial effect. Our usual technique is to give antimony alone for ten injections. This is followed by a fortnight without treatment and if the lesions are showing signs of subsidence we then proceed with routine intramuscular and intradermal treatment with the ethyl esters of chaulmoogra. In one instance we have used it in conjunction with promin with satisfactory results. Where antimony does not produce the desired quiescence in the lesions we interrupt the chaulmoogra course by a three months course of intramuscular bismuth.

We have not found that continuous or multiple courses of antimony have a beneficial effect (in fact case 13 points rather to an injurious effect), nor are we impressed with the intensive method of administration.

We have found it convenient to use antimony in the form of fouadin given intramuscularly and have found stibatin and fantorin to be very similar in effect.

Cases 1 and 2 illustrate complete resolution of tuberculoid lesions after three courses of antimony, each followed by chaulmoogra.

Case 1. Figures 1 and 2. This case (No. 6702) was admitted to this institution in 1936 with "raised, red, spongy maculae on face, trunk, and limbs." He was treated with intradermal and intramuscular injections of iodized ethyl esters of chaulmoogra oil until I assumed duty in 1939. His condition had remained stationary. In April he was given ten intramuscular injections of fouadin and after a fortnight's rest the chaulmoogra was resumed. In June we noted "marked improvement though occasional

islands of erythema persist." A second course of foudain followed by the fortnight's rest was given and chaulmoogra was resumed. In November we noted "macules healing but erythema persists on face." The third course of foudain was then given with complete resolution of all lesions. He was discharged in March, 1940. His nasal and skin smears had always been negative and have remained so.

Case 2. Figures 3 to 6. This case (No. 9689) was admitted in March, 1946 with "multiple raised, spongy tuberculoid macules on the body and more marked on the face. Inflamed ear lobes. Skin and nasal smears negative." A biopsy report read:

Section of this specimen shows round cell infiltration of the corium with foci of reticulo-endothelial reaction of the leprosy type. No acid-fast bacilli have been found in the foci of cellular reaction but numerous *M. leprae* are present in the nerve bundles.

These lesions did not respond to intradermal and intramuscular chaulmoogra and in May he was given ten intramuscular injections of stibatin. After the fortnight's rest chaulmoogra was resumed. In August we noted "macules flatter, repeat stibatin." In December we noted "macules flat and grey." One course of foudain was then given followed by chaulmoogra. In March, 1947 there was complete resolution of the lesions.

It will be noted that both these cases had three courses of antimony. In some instances resolution follows one course of antimony. Cases 3, 4, and 5 illustrate this.

Case 3. Figures 7 and 8. This case (No. 9318) was admitted in January, 1945 with "raised pink tuberculoid maculae. Those on the face are of the spongy variety; those on the trunk and limbs have flat healing centres." She was given one course of foudain followed by ethyl esters of chaulmoogra and was discharged as arrested in 1947.

Case 4. This case (No. 9922) was admitted in March, 1947 with "tuberculoid macules with raised red margins on back and left thigh. Other maculae raised, red and spongy." Ten injections of foudain were given, followed by chaulmoogra. In July we reported "maculae gone from face. Slightly raised and black on left arm and buttocks. Flat on thigh. No maculae are spongy."

Case 5. This case (No. 9975) was admitted in May, 1947 with "tuberculoid maculae with raised red margins, as well as centres, on face, back, and limbs." Foudain—ten injections was followed by chaulmoogra and in July we reported "maculae granular on buttock and neck. Others flat."

We regard the appearance of new maculae as a sign of lowered resistance and an indication that chaulmoogra should be withheld or given in small doses. Antimony is given to build up the resistance. Where this fails we sometimes find bismuth to be of value. Cases 6 and 7 illustrate this.

Case 6. This case (No. 7917) was discharged in March, 1945, as arrested, but returned voluntarily in March, 1946 for treatment to a septic foot. His notes read "depigmented maculae on face, back, and arms. Some maculae have spread beyond the old injected edges." (This refers to the

fact that our intradermal treatment by iodized ethyl esters of chaulmoogra sometimes leaves permanent staining in the skin.) In November he was given ten injections of fouadin because the old maculae had become erythematous and new maculae had appeared on the chest. In July, 1947 we reported "maculae slightly erythematous on face. Occasional erythematous spots on back. Chest healed."

Case 7. Figures 9 and 10. This case (No. 8041) was admitted in 1941, aged 7 years. He was then a purely neural case with "flat maculae, edges slightly pink." New maculae appeared after a year and he was given fouadin. The lesions became worse and in 1943 we noted "large plaque-like maculae." Skin smears were negative. In 1944 he appeared to have become a lepromatous case and we noted "lepromatous infiltration of arms and legs." Smears became positive for the first time: during that year five skin and one nasal smear were positive out of twelve slides. He was placed for three months on weekly injections of bismuth. In 1945 the lesions subsided somewhat and for 15 months smears were negative. In May, 1946 he had an acute reaction "new, very raised and spongy margins outside maculae. These tend to ulcerate. Query lazarine leprosy." He was given fouadin and after four months, during which he had two positive smears, we noted "portions of maculae raised and red, other portions healed." He was placed on therapy that has been advocated for lupus erythematosus, viz: quinine gr.  $7\frac{1}{2}$  t. d. s. by mouth for five days followed by a nine day's rest, plus weekly intramuscular injections of bismuth. At the end of three months we noted "maculae fading." The bismuth was stopped and chaulmoogra continued. Three months later he again went into the acute reactionary phase with very red raised maculae. After a second three month's course of bismuth and quinine we noted "maculae are tissue-papery scars." Since the first course of bismuth and quinine all smears have been negative, i. e. eleven consecutive monthly nasal and skin smears.

We have remarked that we regard the appearance of new lesions to be an indication for stopping routine treatment by chaulmoogra oil. But if new lesions, or exacerbation of old lesions occur under antimony we are prepared to continue with antimony. The next case illustrates this point.

Case 8. This case (No. 9810) was admitted on October 4, 1946, and exhibited "depigmented macules with raised dusky margins and healing centres." In December the maculae appeared more inflammatory and fouadin was given. On January 11, 1947 he developed an acute reactionary phase with very raised and congested margins. Fouadin was repeated. Skin smears which had been negative now became positive. The lesions were so swollen and painful that applications of hot castor oil were necessary. One month later the congestion was so improved that intradermal chaulmoogra was resumed. In July we reported "maculae now flat and tissue-papery. Skin smears now negative."

With the exception of case 7 that became lepromatous during the course of his treatment, we have so far been discussing neural cases. We have instances where we consider that antimony has helped to make lepromatous cases bacilli-free, e. g. cases 9, 10, and 11.

Case 9. Figures 11 and 12. This case (No. 7907) was admitted in 1940 with "discrete nodules on forehead, nose, cheeks, ears, arms, and forearms. Nasal smears and smears from arm and ear positive for *M. leprae*. Plaque-like infiltration of buttocks and forearms." The Wassermann was positive but became negative after three courses of N. A. B. and bismuth. One course of foudin was given in 1941. In 1942 we noted "discrete nodules absorbing. Less infiltration of ears." Despite the clinical improvement skin smears were all positive until 1945 and bacilli were noted "scanty" in January. Chaulmoogra was continued and all smears became negative. The case was discharged in September, 1947.

Case 10. This case (No. 9796) was admitted in August, 1946 with "discrete nodules on the face and erythematous plaques on the cheek, back, and right thigh. Skin smears positive." Three courses of foudin were given in August, December, and January respectively. In July, 1947 we reported "no trace of plaques or nodules. Skin smears negative since February, 1947."

Case 11. This case was admitted in 1944 and classified as lepromatous. During this year all smears were positive and he was given two courses of foudin. In 1945 he began to improve, only two out of twelve smears being positive. In 1946 smears were negative but we noted slight infiltration of the cheeks and foudin was repeated. He has now had 22 consecutive negative nasal and skin smears and is without signs of maculae or infiltration.

We have not used promin in many cases and our experience has been limited to fourteen months treatment, but there are indications that antimony may find a place as an adjuvant treatment to promin, e. g., case 12.

Case 12. This case was admitted in November, 1945 as a lepromatous case with scarlet plaques. These remained unaltered until June, 1946 when promin was started. After eight months of promin they were still very raised and dusky. Antimony was given in February, April, and June together with promin and in July we reported "plaques flattened and fading."

It might be thought that if the response to one, two, or three courses of antimony is good that better results could be obtained by continuing to treat with antimony. This has not been our experience as is shown by:

Case 13. Figures 13, 14, and 15. This case (No. 8699) was admitted in 1943 with "erythematous infiltration of face with rugae and discrete nodules on face, neck, and forearms." (Figure 13.) Two courses of foudin were given in 1943 and two more in 1944 when we reported "only slight infiltration on side of face and ear lobes." (Figure 14.) Four more courses of foudin were given during 1945 at the end of which we noted "firm infiltration of face with rugae." (Figure 15.) Since then he has refused further treatment and his condition has deteriorated.

In 1945 Alves (3) and later Alves and Blair (4) described their technique of intensive treatment of schistosomiasis with antimony. We modified their technique by giving stibatin, (i. e. sodium antimony gluconate) in 10 cc. doses, five times a day for two days. There were no ill-effects and the results seem

to be no improvement on antimony administered in the routine manner as is illustrated by cases 14, 15, and 16.

Case 14. This case (No. 9036) was admitted in 1944 with "pink tinge to raised granular margins of maculae. Centres flat." He refused all treatment until July, 1946 when he took the two-day intensive course. There has been no change in his condition. He refuses further treatment.

Case 15. This case (No. 8666) was admitted in January, 1943 with "diffuse infiltration on face and pendulous ear lobes. Skin smear positive." He was given foudadin followed by chaulmoogra. Smears became negative and remained so until his discharge in 1945. He was re-admitted in February, 1947 with "diffuse infiltration on face, raised erythematous plaques on trunk and limbs." He was given the intensive two-day course of antimony. Some resolution occurred in the centre of the plaques but smears have remained positive.

Case 16. This case (No. 9886) was admitted in January, 1947 with "red raised margins to maculae." Two months after the intensive antimony course we noted "margins to maculae now flat."

#### FAILURES

Antimony is by no means a specific cure for leprosy and we have as many failures as successes to report even out of our selected cases, i. e. cases selected as being of the type or stage of leprosy where antimony might be expected to have a beneficial effect.

Case 17. This case (No. 8581) was admitted in 1942 with "flat maculae." In 1943 we noted "spread of maculae," and foudadin was given. In 1944 it was repeated on two occasions because of "new maculae." In 1945 he was given bismuth and in 1946 two courses of foudadin. In 1947 we reported "erythematous lepromatous plaques on arms and raised red margins to maculae on trunk."

Case 18. This case (No. 9031) was admitted in 1944 with "hypopigmented maculae with clearcut margins on face. Brown maculae with flat centres on trunk and limbs." In 1946 we noted "erythematous patches developing on back." Foudadin was given. In December an acute reactionary phase developed with raised red congested margins. Foudadin was given then, and again in March, 1947, but in July we reported "maculae have become lepromatous plaques and are now positive for *M. leprae*."

Case 19. This case (No. 8944) was admitted in 1943 with "flat depigmented maculae." New maculae developed at intervals until December, 1946 when an acute reactionary phase with raised red congested maculae developed. Despite two courses of foudadin his condition was unchanged six months later.

It may be thought that the evidence submitted as to the effect of antimony is rather flimsy and that this article lacks balance in that no control cases are submitted. In apology I can only state that our control experiments were done almost twenty years ago and I have now no access to those documents. We discovered then that when the antimony had any effect it

did not require much antimony to change the course of the disease and that the use of antimony was limited to getting the patient into a condition where he could benefit from other medicaments. It cannot be too strongly stressed that the phase through which a patient is passing should be recognized and the treatment should be adjusted to every individual. The laboratory cannot help us in this respect but the clinical pictures are clear and with practice can be recognized.

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## DESCRIPTION OF PLATES

## PLATE 1

- FIG. 1. Case 1. Patient in April 1939.  
FIG. 2. Case 1. Patient in March 1940.  
FIG. 3. Case 2. Patient in March 1946.  
FIG. 4. Case 2. Patient in March 1946.  
FIG. 5. Case 2. Patient in March 1947.  
FIG. 6. Case 2. Patient in March 1947.



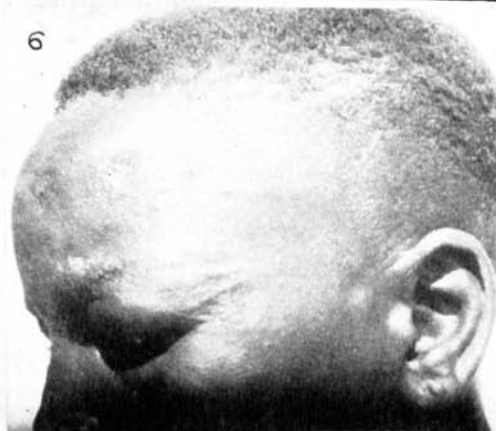


PLATE 1

PLATE 2.

FIG. 7. Case 3. Patient in January 1945.

FIG. 8. Case 3. Patient in March 1947.

FIG. 9. Case 7. Patient in May 1946.

FIG. 10. Case 7. Patient in July 1947.

FIG. 11. Case 9. Patient in 1940.

FIG. 12. Case 9. Patient in March 1947.

FIG. 13. Case 13. Patient in 1943.

FIG. 14. Case 13. Patient in 1944.

FIG. 15. Case 13. Patient in 1947.



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