The Uses of Mercurochrome Soluble 220 in Leprosy.

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IN 1925 an article by Denney, Hopkins, Wooley and Barentine was published giving the results of the intravenous use of Mercurochrome in the treatment of leprosy. Their conclusions were as follows :—

" 1. Mercurochrome soluble 220 has not proved to be specific for leprosy.

" 2. Mercurochrome soluble 220 has been helpful in checking rapid retrogression in leprosy.

" 3. Mercurochrome soluble 220 has been of value in the treatment of ulcers, the result of disintegrating tubercles.

" 4. Mercurochrome soluble 220 has been helpful in the healing of neuro-trophic ulcers.

" 5. Mercurochrome has not been helpful in checking the unfavourable progress of pulmonary tuberculosis in leprosy ; on the contrary, this complication was apparently aggravated."

More recently an article by Rao and Roy (1932) mentioned promising results in 12 cases of leprosy.

We have been using Mercurochrome at the Gobra Hospital for some months and have found it useful given either intravenously or intradermally.

In all 35 cases have been treated and the results of treatment are given herewith in brief.

1. Soorja Kumar Saha—C2. Sedimentation index rose from 28 to 40 after vaccination. After each dose of intravenous Mercurochrome 5 c.c. temperature rose for one day to over 100. Sedimentation index now 27. Nodules swell up and burst with rise of temperature and sedimentation ; as they heal up these come down.

2. Soshi Kumar Roy—C3. No rise of temperature after 10 c.c. intravenous Mercurochrome except after first dose when rise to 103. There was some slight albuminuria and gum pains next day which disappeared the day after. Pain in the body disappeared with first injection of 10 c.c. though it had previously lasted more than a month and had not yielded to diathermy.

3. B. N. Dutt—C3-C2. Constant rise of temperature between 103 and 104 for two and a half weeks. Temperature normal in three days after one injection of 10 c.c. Mercurochrome. Injection has been given once a week from January

28th to May 14th. Condition much improved. Skin clearer and swelling of legs subsided.

4. J. Ward—C3. Mercurochrome 3 per cent. solution intradermally in doses of 2 c.c. twice a week given since April 7th, 1932 ; sedimentation remaining between 9 and 13. Eyes and general condition of patient considerably better.

5. Akhil Ch. Sarkar—C3. Running low temperature. Mercurochrome given intravenously 5 c.c. since February 24th once a week. One dose of 20 c.c. given on March 28th caused sedimentation rise from 14 to 28 ; therefore, only 5 c.c. given. 2 c.c. 3 per cent. solution given intradermally twice a week since April 27th.

6. Abeng—C3. Febrile rise from 100 to 101 daily for two weeks. 5 c.c. Mercurochrome intravenously followed by 8 c.c. three days later brought temperature to normal and all signs of reaction, swelling and bursting of nodules on left forearm, face and forehead, stopped.

7. S. Korban—C3. Pains in body. 5 c.c. Mercurochrome intravenously relieved pains, no rise in temperature. 15 c.c. on May 11th after which a few nodules on ears burst, and slight pain in gums. No albumen in urine. General skin condition (streptococcal) has improved.

8. Moung Main—C3. Mercurochrome 2 c.c. 3 per cent. solution given first once a week, later twice a week, caused rise of sedimentation from 17 to 31, but fall to 15 after intermission for one week.

9. A. E. Dutt—C3. 2 c.c. of 3 per cent. solution, twice a week since April 12th. Nodules came on thigh. Skin much cleaner and less septic.

10. George Venture—C3. First 5 c.c. Mercurochrome given, later 10, then 15 c.c. Bursting of nodules after 15 c.c. Had very bad nerve pains which was only slightly helped by diathermy, but has lost these pains after Mercurochrome. Pain in gums and rise of temperature to 100·4 for 3 days after 15 c.c., but thereafter patient brighter and generally better.

11. J. Smith—C3. 3 c.c. then 4 c.c. Mercurochrome intravenously. Sleeps and feels better. Septic condition and swelling of feet very much better.

12. Janaki—C3. Temperature rising to 105 for ten days. From April 7th, Mercurochrome 5 c.c. intravenously. Fall of temperature to normal ; rise again to 100. After third dose of 5 c.c. fall of temperature to normal which continues last two weeks. General condition much improved.

13. Manindra Ch. Dass.—C3. 2 c.c. 3 per cent. solution Mercurochrome intradermally. After two injections rise

in sedimentation from 25 to 44: 5 c.c. followed by 7½ and 10 c.c. temperature remains normal, sedimentation 18, 17, nerve pains which were had before have subsided, though diathermy for two months had only slightly relieved them.

14. Benoy K. Das—C3. Mercurochrome intravenously was followed by disappearance of fever. Mercurochrome 2 c.c. 3 per cent. solution intradermally was followed by fresh nodules of left arm and pain of left ulnar; rise of sedimentation from 15 to 42. Subsequent injections twice a week; temperature normal sedimentation 23; Mercurochrome is now being given intravenously once a week and intradermally once a week. Skin is much cleaner and less septic, isolated nodules are bursting.

15. Amina Mahapatra—C3. Mercurochrome 5 c.c. intravenously three doses once a week, reaction in eye after third dose.

16. Sumbhu Karmakar—C2. Mercurochrome 2 c.c. 3 per cent. solution intradermally 5 doses; nothing noted yet.

17. Jogendra Das—C2. Mercurochrome 5 c.c. intravenously once a week since March 22nd; temperature rose to 103 for one day. After the next injection the temperature rose to 100; but after subsequent injections there was no febrile reaction. Sedimentation 46-36-30-29; lesions less prominent.

18. Profulla Chakrabutty—C3. Mercurochrome intravenously 3 c.c. temperature 100; later 4·5 c.c. no rise of temperature. Looks and feels much better. Sedimentation index fell from 70 to 57. Skin much cleaner.

19. Joynuddin—C3. Mercurochrome 5 c.c. intravenously once a week since February 28th. The first injections produced temporary pain in gums, but after the later injections this was less. Sedimentation index has gradually fallen from 65 to 22; slight rise of temperature to 100 after injections, nodules bursting from time to time.

20. Evers—C2. Mercurochrome 3 per cent. solution 2 c.c. intradermally once a week given from February 18th to May 15th; result is bursting of nodules.

21. Patal Ch. Das—C3. 5 c.c. Mercurochrome given intravenously for two months. Bursting of nodules after first, second and third injections, but not after the rest.

22. G. N. Laha—C2. Mercurochrome lower doses were given for the first five days then 10 c.c. intravenously. Slight rise of temperature, first 100 then 99. Running temperature stopped after first injection. Sedimentation index fallen from 42 to 16. General condition much improved. Streptococcal infection of skin is less.

23. Abdul Aziz No. 2—N2. Mercurochrome 5 c.c. intravenously once a week and 10 c.c. once a week since March 10th. Later 2 c.c. 3 per cent. solution intradermally. Patches more marked and edges thicker after intravenous injections. Nothing noted so far after intradermal injections.

24. B. Rowland — C3. Mercurochrome 2 c.c. of 3 per cent. solution twice a week intradermally; nodules bursting and drying up; general condition improved especially eye. Sometimes after injections a little pain in forehead lasting one or two days.

25. Upendra Nath Mondal—N2. Mercurochrome 5 c.c. once a week; at first rise of temperature to 102, later to 99 or remained normal; macules become more prominent and new patches appeared. Arms become more anaesthetic and weaker and fingers bent; later given 2 c.c. 3 per cent. solution intradermally twice a week.

26. Chandlow Choni—C3. Mercurochrome 2 c.c. 3 per cent. solution twice a week intradermally one month; no marked change.

27. A. K. Maitra—C2. 2 c.c. 3 per cent. solution twice a week since April 1st; skin has become much better, with disappearance of a general chronic streptococcal dermatitis; eye inflammation gone; general condition much improved. Small slight patches appear in places, which are again infiltrated with the drug intradermally.

28. S. P. Kurti—C3. Intravenous injections of Mercurochrome 10 c.c. once a week for three months. Rise of temperature to 103 lasting one day; deep subcutaneous nodules bursting. Albumin in urine lasting 24 hours after first two injections but not subsequently. Few new patches appeared. General condition better. Sedimentation 10-15.

29. Tesruddin—C2. 5 c.c. Mercurochrome once a week; later 7½ c.c.; then 10 c.c. six injections intravenously. Sedimentation index fell from 43 to 11 and irregular temperature stopped after third injection.

30. Majibar Rahman—C2. Mercurochrome 5 c.c. intravenously once a week, five injections; small patches appearing.

31. Thomas John—C2. Mercurochrome 5 c.c. intravenously; nodules burst; general condition better. Superficial nodules at first burst and healed up, then deeper nodules burst.

32. M. Chowdhury—C2. Mercurochrome first dose of 10 c.c. caused vomiting, purging and inflammation of eyes, swelling of gums, later 5 c.c. caused pains in gums lasting 15 minutes only and pain in eye for a short time only; a

week later 10 c.c. without symptoms. Eye reacting a little—less vision and pain—after injections for a day and then improvement.

33. C. Leiester—C3. Mercurochrome first intradermally with no marked effect. Intravenously 2 c.c. gave pain in eyes and nerves but subsequently both were better. This was repeated three times with some improvement in eyes.

34. Alam—C3. Mercurochrome intravenously 3, 5, 7½, 10 c.c.; patient appears better and more active.

35. Abdul Rahaman—C3. Fever for eleven months with reaction and bursting nodules. After four injections of 10 c.c. of Mercurochrome temperature became normal and patient recovered from reaction.

36. Miss E.—C2. Lepra reaction for 23 days. High temperature. Swelling up and erythema of lesions all over body. Blood negative for malaria. Quinine sulphate, alkalis, etc., administered without benefit. Mercurochrome 3 c.c. of 1 per cent. solution given intravenously; temperature dropped to normal. General condition good. Local signs of reaction passing off. Sedimentation index, which was at 13 at beginning of reaction, gradually rose to 45.

Discussion.

The signs and symptoms and other effects connected with the administration of Mercurochrome may be discussed under three headings :—

1. First the immediate unpleasant effects unconnected with leprosy.

(*a*) There is generally a rise of temperature from 1 to 5 degrees above normal, varying with the size of the dose and the sensitiveness of the patient. It will be noticed, however, that tolerance is produced in practically every case and that if 3 or 5 c.c. of a 1 per cent. solution in distilled water are given to begin with it is generally possible to raise to 10 or 15 c.c. for a patient of about 10 stones weight.

(*b*) Another symptom is painful and inflamed gums. One might suspect this to be due to the mercury contained in the drug; but obviously this is not so, as only the first few doses produce this symptom and as a rule subsequent doses do not. It would appear rather that the pain and inflammation are due to the presence of some septic infection of the gums which is first exacerbated and then overcome by the drug.

(*c*) Diarrhœa, vomiting and other signs of gastro-intestinal irritation are not uncommon if 10 c.c. of a

1 per cent. solution is given as the first dose. These symptoms are probably also due not to any irritation of the drug but to its stirring up of septic infections in the stomach. Because of these symptoms and the febrile reaction often produced by large doses it is well to begin with small doses.

(*d*) Albuminuria should be considered a contra-indication to Mercurochrome. It will be noticed, however, that only in one patient (Case 2) did this sign occur after injection and then after the first injection only. The urine was examined as a routine before and after the first few injections at least. With regard to the undesirable effects of Mercurochrome (apart from those connected with leprosy) it may be said that these are probably due to lighting up of already present septic infections, and that the drug tends to eliminate these infections at least to the extent that after the first few doses injections are followed by no unpleasant symptoms.

2. Secondly, we shall consider the immediate beneficial effects of Mercurochrome in stopping reactions, clearing up septic foci and improving the general health of the patient.

(*a*) In stopping reactions. In many of the cases recorded above, Mercurochrome was given with the object of stopping lepra reactions, as in cases 3, 5, 12, 14, 22, 29, 35 and 36. The effect was most marked in the last two cases as they were suffering from very severe reactions. The importance of having a drug which will stop lepra reaction cannot be over-emphasised. Previous reference has been made by one of us to the beneficial effect of potassium antimony tartrate (Muir, 1927) in reaction but Mercurochrome seems to be much more powerful in stopping reaction. In Case 35, a febrile reaction lasting for eleven months was brought to an end by four injections, and there was a marked improvement even after the first dose.

(*b*) Another marked benefit is the clearing up of septic dermatitis, a condition very common in leprosy and often wrongly supposed to be part of the leprous condition. This improvement was noted in Cases 3, 7, 9, 11, 14, 18, 22 and 27. In many patients, the removal of this condition causes an improvement in the leprous lesions themselves.

(*c*) Relief of muscular, joint and nerve pains is another marked effect of Mercurochrome. In many of the cases arthritic and muscular pains disappeared in a spectacular manner, the most striking cases being 2,

7 and 11. Nerve pains were relieved in 2, 10, 13, which were the only cases in the series suffering from this condition. In these three cases treatment with diathermy had been tried with some relief, but Mercurochrome produced much more striking results.

(*d*) Eye involvement is one of the most serious complications in leprosy. In Cases 4, 27, 32 and 33, there was marked improvement in the eye condition, though in some of them there was a temporary increase of the eye symptoms after the earlier injections. In cases of serious eye infection it is well to begin with even smaller doses than usual and to increase the dose more slowly.

3. The effects on leprosy lesions.

(*a*) In Cases 1, 8, 9, 10, 20, 21, 24, 27 and 31 swelling up, abscess formation and bursting of nodules was produced. It was significant, however, that in most of these patients this phenomenon was associated with general improvement of the health. In some of these cases, the more superficial nodules burst first, the deeper ones liquefying and coming to the surface later. It was noticed that after their liquefaction and bursting the deeper nodules were no longer palpable. Although this process was caused by intravenous injections in Cases 1, 10, 21, 28 and 31, it was caused in the others and to a much more marked degree by intradermal injections. The liquefaction took place in nodules distant from the sites of intradermal injections. It was noted that liquefaction and bursting was accompanied by a rise in temperature and in the sedimentation index which subsided after the healing up of the abscesses.

(*b*) Similar to the abscess formation in nodules was the swelling up of old lesions, especially at the margin and the appearance of new lesions where they had not been previously visible (Cases 23, 25, 27, 28 and 30).

It may be mentioned in this connection that in leprosy many parts of the skin show no visible sign of disease in parts where examination of sections demonstrates that the disease is really present. It must not, therefore, be supposed that the appearance of new lesions is necessarily a bad sign. This, like the abscess formation in nodules would seem to be an attempt of nature to deal with and destroy existing lesions.

In a few of the cases treatment has not been carried on long enough to produce improvement, but in only one case (25) was the patient really worse. No case with tubercular

complication was treated ; but Denny and his co-workers obtained unfavourable results in such cases.

Conclusions.

1. Mercurochrome soluble 220 may be given safely in almost all cases of leprosy. Albuminuria and tuberculosis are contra indications.

2. Small doses should be used at first, 3 or 5 c.c. of a 1 per cent. solution in distilled water for a 10 stone adult ; and according to the tolerance of the patient the dose should be gradually or rapidly increased to 10 or 15 c.c. Injections should be given intravenously once a week, or, if urgent symptoms are present, twice a week for the first few smaller doses.

3. Mercurochrome is found useful in clearing up septic conditions which are so frequently present as complications in leprosy. Among these may be specially mentioned pyorrhœa, gastro-intestinal infections, chronic inflammations of the skin, various painful rheumatic conditions and septic ulcers. The removal of these infections causes improvement in the general health of the patient and is a decided help in dealing with the leprous infection.

4. Mercurochrome gives marked results in clearing up the allergic condition known as lepra reaction or lepra fever. It is difficult to say whether this is due chiefly to the removal of septic infections or to a more direct effect on the allergic condition itself.

5. It is yet too soon to say to what extent Mercurochrome will prove useful in clearing up lepromata. It has a marked effect in causing liquefaction, abscess formation and evacuation of cutaneous and subcutaneous nodules ; but care must be taken not to produce this process too rapidly, as the general condition of the patient is temporarily lowered, improving again when the abscess heals up. Intradermal injections appear to have a stronger power of producing abscess than intravenous injection. In addition, new patches appear and old lesions become more prominent as the result of Mercurochrome, though there is reason to believe that this is generally not an exacerbation of the disease but rather a part of a process of healing.

A good combination of treatment may be to give intravenous and intradermal injections alternately, once or twice a week infiltrating any fresh lesion that may appear or old macules, etc., that may become more prominent.

We have found a 3 per cent. solution most suitable for intradermal injection. This is given by the method described

by one of us (Muir, 1932). The usual dose is from 1 to 3 c.c. For intravenous injection a 1 per cent. solution should be used.

This is a preliminary report based on observations in 36 cases. It must be realised that the use of Mercurochrome in leprosy is still in the experimental stage; but if the precautions mentioned above are observed there is little danger of untoward results being obtained by careful workers.

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