

Original Articles

THE COMPARATIVE VALUE OF SOME METHODS OF TREATMENT IN CASES OF TROPICAL ULCER

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Introduction

THE present state of our knowledge regarding the treatment of tropical ulcer (naga sore) is very unsatisfactory. A search of the literature available to me reveals very few series of controlled treatments and many of the claims made for various methods of treatment have not been substantiated by subsequent workers in this field. Moreover, the existence of many different methods of treatment of any one disease can usually be safely taken as an indication that none of them is really satisfactory.

Two opportunities have come my way recently. One is the presence of an epidemic of tropical ulcer in a group of tea estates under my medical charge; the second is the fact that supplies of penicillin are now freely available. The occasion has, therefore, been favourable for a large-scale experiment in treatment and, as the population under experiment is subject to some degree of discipline, it has been possible to carry out several series of parallel treatments under controlled conditions.

All the ulcers treated and recorded in this paper agreed with the usual description of the acute tropical phagædenic ulcer, and in every case where smears from the floor of the ulcer were examined, fusiform bacilli were found. The cases comprise all cases of tropical ulcer on five estates whose treatment commenced during the period 15th May, 1946 to 15th June, 1946. On each estate at least three methods of treatment, including penicillin, were used and no conscious selection of cases for any particular line of treatment was made. The number treated with penicillin was comparatively small because the drug is expensive and I was not in a position to advise extensive use of it until proof of its efficacy was forthcoming.

Previous References to Treatment

A search through the available literature reveals the following papers in which the period required for complete healing by various methods of treatment is recorded.

Corkill (1939) treated 28 'recent' cases with daily dressings of cod-liver oil combined with oral administration of one capsule of vitamin A concentrate daily. His control series of 30 similar cases received no vitamin concentrate and were not dressed with cod-liver oil. Most of this series were dressed with

'Zipp'. The average time taken to heal the vitamin group was 45 days and that for the other group was 39 days, the average healing rate *per diem* being 0.26 mm. in each series.

Bharucha (1943) used two methods of treatment. Treatment I involved daily dressing with 1/150 copper sulphate solution till the slough disappeared, followed by 40 per cent cod-liver oil in vaseline under elastoplast. Treatment II consisted in daily dressings with a powder containing 50 per cent sulphanilamide and 50 per cent iodoform followed by bi-weekly dressings with red lotion. Of those healed by treatment I, the average times taken were:—

Under one inch	35 days
One to two inches	46 days
Over two inches	54 days

The cases under treatment II included those originally on that treatment together with the failures from treatment I. In the latter case, only the number of days on treatment II has been included in the calculation. The average times taken were:—

Under one inch	20.7 days
One to two inches	28.6 days
Over two inches	31.3 days

Panja and Ghosh (1944) recommended removal of the slough with hydrogen peroxide followed by normal saline compresses changed every hour during the day, combined with daily bathing in 1/5,000 Condy's fluid and a nightly dressing with a powder of equal parts boric acid and sulphathiazole or sulphanilamide. When the ulcer was clean it was dressed twice daily with 0.5 per cent acriflavine ointment. Even with this elaborate and time-consuming method of treatment healing of their cases took 21 to 42 days.

Pattanayak (1944) recorded his results with a number of different methods of treatment but most of his individual series were small and he does not make quite clear exactly what periods elapsed between the commencement of treatment and complete healing. The average time appeared to be about 40 days.

Marsh and Wilson (1945) used occlusion by plaster of paris combined with a variety of local dressings, of which they preferred bipp and zipp ointments and powdering the ulcer with a thin layer of crystals of potassium permanganate. They report that 'of 85 cases, 59 were completely healed in an average time of just over 2 weeks'. Actually, a study of their figures shows that the average period of healing was 5.6 weeks (39 days) and that, even of those 49 which were healed in less than ten weeks, the average period of healing was 4.5 weeks (31.5 days).

Rao *et al.* (1945) used a complicated method involving cleaning of the ulcer under anaesthesia with a special preparation and dressing with another special preparation. They say that 'in less than three weeks the small ulcers were

almost healed and the large ulcers showed considerable improvement. This suggests that their average period of healing would be not less than 30 to 35 days.

Brecher (1946) adopted an occlusive treatment using adhesive plaster changed once weekly, combined with weekly injections of nearsphenamine and bismuth subsalicylate. The average time required for healing was 42 days, 85 per cent being healed within 60 days.

It seems that a fair average for all these different observers, using such a variety of treatments, would be not less than 35 days and probably longer.

Panja (1945) treated one case only with penicillin, using the drug as a wet dressing in a strength of 100 units per c.c. Four days on this solution produced clean granulation tissue and the penicillin was then discontinued. The sore healed up within seven days. This is the only reference I have been able to find to the use of penicillin in the treatment of this disease.

Present series of cases

The number of cases dealt with in the present investigation was 265, of which 86 were less than one inch in diameter, 66 were over one inch in diameter (all these cases were single ulcers) and 113 were cases with multiple (*i.e.* more than one) ulcers. The proportion of cases with more than one ulcer is strikingly high and seems to be a feature of the present epidemic.

The following methods of treatment were adopted:—

(a) Daily dressing with a compress of saturated mag. sulph. solution until the ulcer was clean, followed by daily dressing with cod-liver oil.

(b) Similar daily dressing with mag. sulph., followed by daily dressing with sulphonamide powder dusted on dry.

(c) Daily dressing with a compress of copper sulphate solution 1 in 150 in water until the ulcer was clean, followed by daily dressing with a 1 in 1,000 emulsion of acriflavine in sterile liquid paraffin.

(d) Daily dressing with a paste containing copper sulphate and phenol in glycerine—James' modification of McGuire's treatment (James, 1938)—followed by daily dressing with dry sulphonamide powder.

(e) Intramuscular injections of penicillin combined with daily dressing of the ulcers with cod-liver oil. In 12 cases the amount of penicillin given was 200,000 units spread over 48 hours (three-hourly injections). In the remaining 53 cases the amount given was 100,000 units administered in five three-hourly injections between 9 a.m. and 9 p.m. No use was made of local dressings with penicillin solution in this series as information was wanted as to how far the supposed circulatory stasis

postulated by so many authors would or would not interfere with the action of penicillin.

(f) Three injections of nearsphenamine at five-day intervals combined with local cod-liver oil under an occlusive dressing of elastoplast, changed at five-day intervals. Only three cases were treated by this method as the experiment was only designed to show that nearsphenamine has no action on the fusiform bacillus.

In all cases the method of treatment selected was rigidly adhered to until at least 47 days had elapsed when the case was considered a failure as regards that particular method. After the forty-seventh day the treatment was either changed or adhered to according to the clinical condition of the case. The period of 47 days was arbitrarily selected because it was intended to review the results of treatment on the 31st July and any case admitted on 15th June and still unhealed on 31st July would have been under treatment for 47 days. Moreover, it was considered that since the average period required for healing reported by previous authors was in the region of 30 to 35 days, any ulcer which was not healed in 47 days must be considered as having benefited very little, if at all, from the particular treatment adopted.

No case was considered healed until epithelialization was complete, leaving a firm scar with no scab, the patient being considered fit to resume work immediately in the tea garden.

The results of treatment by each particular method are tabulated below:—

Clinical types	SUCCESSFUL IN 47 DAYS		UNSUCCESSFUL	
	Number	Average number of days to heal	Number	Per cent
(a) <i>Mag. sulph. and cod-liver oil. Total number of cases 59</i>				
Under 1"	24	24.8	6	20.0
Over 1"	6	35.3	5	45.5
Multiple	11	28.5	7	38.9
TOTAL ..	41	27.3	18	30.5

Note.—Very nearly one-third of this series showed little response to treatment; in those who did, the average time required for treatment was a fraction under four weeks.

(b) <i>Mag. sulph. and sulphonamide powder. Total number of cases 70</i>				
Under 1"	9	24.7	6	40.0
Over 1"	13	31.5	6	31.6
Multiple	22	33.1	14	38.9
TOTAL ..	44	30.9	26	37.1

Note.—More than one-third of the cases must be regarded as failures and in those which were favourably influenced by the treatment, the average period needed was about four and a half weeks.

(c) *Copper sulphate and acriflavine. Total number of cases 35*

Under 1"	8	29.6	2	20.0
Over 1"	2	27.5	3	60.0
Multiple	16	29.8	4	20.0
TOTAL ..	26	29.6	9	25.7

Note.—In this series failures amounted to only just over one-quarter of the total but the average period of treatment required in those that responded was four and one-quarter weeks.

(d) *Copper sulphate paste and sulphonamide. Total number of cases 33*

Under 1"	16	29.1	2	11.1
Over 1"	2	22.5
Multiple	11	29.3	2	15.4
TOTAL ..	29	28.7	4	12.1

Note.—The proportion of failures in this series was much lower, in fact the lowest in all the groups tested, but the average period of treatment required remains at a fraction over four weeks.

(e) *Penicillin and cod-liver oil. Total number of cases 65*

Under 1"	11	26.7	2	15.4
Over 1"	22	24.5	4	15.4
Multiple	17	20.7	9	34.6
TOTAL ..	50	23.7	15	23.0

Note.—The proportion of failures is still high, just under one-quarter, but the period of treatment required in those cases which were favourably influenced has been cut to a little over three weeks.

(f) *N.A.B. and cod-liver oil under elastoplast*

Only three cases were treated by this method. All were single ulcers over one inch in diameter; two, 66 per cent, were failures; the single case which responded required 25 days.

Discussion

It has been shown by previous observers that the bacteriology of these ulcers bears a close relation to their clinical condition and that, as the ulcer becomes clean and acquires a healing edge, fusiform bacilli disappear from smears made from the base of the ulcer. Conversely, when an ulcer which has previously been found to contain large numbers of fusiform bacilli produces smears containing little or no fusiform bacilli, speedy healing can be expected. In two of the cases treated with N.A.B. there was no alteration in the smears until after the treatment had been changed and in the other the smears did not alter until after the third injection. These findings support an impression I had gained previously on clinical grounds that

Vincent's organisms are not affected by anti-syphilitic treatment.

Within the scope of this experiment penicillin may be said to have exerted a favourable influence on the healing of the ulcers. The proportion of failures was, with the exception of the rather small copper sulphate paste group, lower than under any other form of treatment and the average time required for healing was the lowest in the whole series. Actually, the results were disappointing because microscopical examination of smears repeatedly showed complete, or almost complete, absence of fusiform bacilli within 24 hours of the last injection of penicillin. This finding would justify one in the belief that rapid healing would follow and, in one case which I dressed myself entirely, such rapid healing did follow. Moreover, at two hospitals where numbers under treatment were not great and the staff were able to take greater care the results were consistently better. I am therefore reluctantly driven to the belief that many of these cases were to some extent re-infected during their treatment and the cod-liver oil had not sufficient antiseptic effect to deal with the re-infection.

For this reason I have recently started combining parenteral penicillin (95,000 units in 12 hours) with daily dressings for five days of gauze soaked in penicillin solution (500 units per c.c.) and following this with daily dressing with scarlet red ointment. The results so far appear to be good but it is too early to draw valid conclusions.

The very definite predilection of tropical ulcer for the lower third of the leg has been explained by an assumption that there is a slowing of the circulation in this area. This assumption has always seemed to me unnecessary as the site selection can be adequately explained on other (epidemiological) grounds. It is, therefore, interesting to note the speed with which a foul, offensive ulcer, full of felted slough containing myriads of fusiform bacilli, becomes clean and apparently sterile after intramuscular injections of penicillin. Having once seen this happen one would rather be inclined to say that these ulcers had a particularly good blood supply.

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