A METHOD OF TREATING INFECTED ULCERS.

BY

S. A. PFANNENSTILL, M.D.,

LATE CHIEF PHYSICIAN OF THE MUNICIPAL HOSPITAL, MALMÖ, SWEDEN.

IN 1910 I published an account of a new method for the treatment of infected ulcers, based on principles which had not been previously applied to therapeutics. The ordinary antiseptic treatment of ulcers does not always yield satisfactory results, owing to the fact that even the strongest antiseptics, applied to an ulcer, only kill the surface bacteria, without reaching those at even a slight depth, these being destroyed eventually by the general bactericidal powers of the patient. This destruction is, in general, satisfactory, except in the case of tuberculous, syphilitic, and certain tropical ulcers; but the time taken is often very long, which is very trying to the patient and the physician. I therefore set out to find a means of attacking the bacteria with a sufficiently strong antiseptic, not only on the surface of an ulcer, but also in the sub-jacent tissues. I thought this might be effected by the use of two substances which would interact to form a third substance with antiseptic properties. Moreover, since elements in the nascent state have enhanced chemical affinities, and consequently greater bactericidal properties, I wished to make use of this fact in the new treatment.

For the first of these substances I have used sodium iodide, administered orally, one of the elements in which is the highly potent iodine. This salt is non-poisonous, and in medicinal doses is ordinarily without unpleasant results; it is very quickly absorbed into the blood and is so carried by the circulation to the ulcer. There it meets some second substance, applied locally, which can set free iodine from the compound salt. Such substances are not difficult to find, the chemical combination of iodine with sodium being loose. It is not only freed by chlorine and the hypochlorites (Dakin's and Carrel's solutions) but also by any strongly oxidizing substance such as ozone and hydrogen peroxide. I have tried all these substances, and I generally prefer the peroxide solution as being the handiest and always constant in composition.

Iodine, for long considered one of our very best antiseptics, acts under these conditions in the nascent state, thus increasing its already great bactericidal properties. I must also draw attention to a subordinate point that may in some cases be important. Hydrogen peroxide, when in acid solution, frees iodine more easily and to a greater extent than in a neutral solution, the sodium radicle entering into combination with the acid. I therefore now acidify the peroxide solution with a small quantity of an acid, it does not matter which; I generally use acetic acid, but employ boric acid in treatment in the mouth, thus avoiding injury to the teeth.

Practical Application of the Method.

In the case of an ulcer on the surface of the body or the limbs I give sodium iodide in an average dose of 15 grains two or three times a day. Larger doses may be given, 60 to 90 grains a day, the effect of the treatment then being greater; but this entails some risk of iodism. Immediately after the first dose of sodium iodide the local peroxide treatment begins. The ulcer is covered by a layer of cotton-wool, not too thick, which is kept continually soaked with the peroxide solution dropping from a dropping-phial every tenth or fifteenth minute, or even more frequently. The more thoroughly the wool is soaked with peroxide the greater is the effect obtained. The strength of the peroxide solution must be kept at 1 to 3 per cent., generally 1 to 1½ per cent., because stronger solutions often irritate the sound skin around the ulcer. An addition of 1/4 to 1/2 per cent. acetic acid will prove quite sufficient for acidifying.

Since the blood contains most sodium iodide about one to two hours after its administration, special attention should be devoted during that time to the thorough soaking of the ulcer with peroxide solution. After the last dose of sodium iodide has been given for the day the local

treatment of the ulcer should be continued for at least three to four hours in order to make full use of the iodide which is still circulating in the blood and will be gradually excreted by the kidneys.

When the ulcer has invaded the deeper tissue layers, forming pockets, it is necessary to tampon the pockets loosely with gauze in order to bring the infected walls of the ulcer into intimate contact with the peroxide solution dripped on the gauze. Infected cavities in bones and joints are to be treated in the same manner. Fistulae, however, usually cannot be directly treated, it being difficult, or even impossible, to conduct the peroxide solution in sufficient quantity through the narrow ducts. It cannot be repeated too often or too strongly emphasized that the efficiency of the method depends upon there being an intimate and prolonged contact between fresh hydrogen peroxide and the infected surface to which sodium iodide is being carried through the blood vessels. A surgical operation will sometimes make a fistula suitable for this treatment.

For treating ulcerations in the nose the nasal cavity must be loosely plugged with gauze upon which the peroxide solution must be dripped as before indicated, care being taken that the patient's head is held back so as to enable the liquid to flow up into the nose. In treatment of affections in the mouth and throat the method of applying the peroxide solution must be changed. In the case of the mouth it is usually sufficient to rinse it frequently with peroxide at intervals of a quarter of an hour or less. For treating the throat a spray apparatus is necessary; different types are on the market, some being driven by compressed air. When hydrogen peroxide is being used for treatment of affections in the mouth and throat it must be remembered that it is not permissible to make the solution acid with the common acids, lest the teeth should be injured. The only acid suitable is boric acid, this being inoffensive to the teeth and quite effective in a 1 per cent. dilution.

The efficiency of this method of treatment is due to the antiseptic agent, iodine, being generated in the nascent state locally; it operates at a deeper level in the infected tissues than do other antiseptics, the iodine being generated not only on the surface but also at some depth under it. Nevertheless, we must presume that even this strong bactericide cannot itself kill all the microbes in an infected ulcer; to do this it must be aided by the bactericidal powers of the patient. These are always a very important factor in the healing of every local or general infectious disease. The method suggested is designed to help the body to conquer a local lesion, thus shortening the duration of the infection and accelerating its cure. In cases where the body cannot unaided overcome a local infection this procedure will supply an additional bactericidal auxiliary.

Conditions in which the Method has proved Successful.

The ulcerations in which the method has been employed may conveniently be divided into two groups—namely, common infected ulcers and tuberculous ulcers. In the former group may be included all ulcers appearing spontaneously, or after trauma, or infected by pyogenic organisms; in the latter all tuberculous and lupoid ulcerations. All ulcers belonging to the first group are generally treated successfully by the method, but since its application is less convenient than the usual methods of treatment it should be reserved for serious cases, in which these latter methods are less efficacious, such as phagedaenic chancre and infection in open joints and bones. The method has proved very valuable in treating infectious conditions and ulcerations in the mouth and pharynx, such as mercury stomatitis, pyorrhoea, gingivitis, and angina necrotica (Vincenti). It has an extensive application in dental surgery for treating pyorrhoea, but the gum must first be separated from the teeth to enable the peroxide solution to reach the actual infected spot.

The method has been frequently employed in treating tuberculous and lupoid ulcerations in the nose and throat, but with variable results. This is due partly to the histological structure of the tuberculous ulcer and partly to the mode of action of the method. Tuberculous tissue commonly extends deeply below the free surface of the

ulcer, superficial tuberculous infections being comparatively rare, and the extent of the remedial action is necessarily limited. It follows that only in the case of superficial tuberculous ulcers can a thorough and permanent cure be expected; with deeper infections no lasting cure is to be obtained. Superficial healing will often occur, but deeper down the tubercles continue to grow; sooner or later they will sprout through the cicatrix or beside it.

Laryngeal tuberculosis deserves special mention. I have treated a large number of cases by my method, and in many of them I have obtained a perfect and lasting cure; others, which remained unaffected, indicating the correctness of the two principles mentioned previously. Careful attention must be paid to the condition of the lungs. If these are too extensively diseased it is no use trying to cure a local tuberculous affection. Advanced and progressive lung tuberculosis, with its corollaries of anaemia and cachexia, forbids the application of the method, since the patients can barely tolerate it, and the body has lost its power of recuperation. The treatment of local tuberculosis may be summed up as follows. For tuberculous and lupoid ulcers a complete and lasting cure can be obtained if the infection has not penetrated too far into the tissues, but if the infection is deep, as is commonly the case, only a superficial healing, or none at all, is to be expected.

The Treatment of Tropical Ulcers.

It is well known that external ulcers are very numerous and difficult to cure in the tropics. Not only are there those ulcers which commonly occur in temperate climates and which, owing to unfavourable tropical conditions, progress unfavourably, but also there are ulcers which are indigenous. I believe that my method should be particularly useful in the treatment of these tropical ulcers, and, since the British Empire includes the most extensive tropical dominion in the world, I have ventured to submit my proposal to the BRITISH MEDICAL JOURNAL in the hope that it will thus reach those regions where it is likely to prove of most use.

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Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

TRACHEOTOMY TUBE WORN FOR OVER SIXTY YEARS.

I saw recently, in consultation with Dr. Benson Goulding, a case that may be worth recording.

It was that of an old lady, aged 81, who when 10 years old got "scarlatina followed by croup," and was tracheotomized very urgently in her home by Mr. Hutton, of "railroad catheter" fame in this city. She still wears the tube. She quotes Mr. Hutton as saying that she was only the third case of tracheotomy in Dublin, the other two having been performed in the Richmond Hospital.

The operation was a high tracheotomy. The voice when she stops the tube is quite good and pleasing. The larynx appears normal in phonation, but the rima glottidis does not open from ankylosis of the arytenoids. She has been perfectly healthy since the operation except for some rheumatic

arthritis, has never had bronchitis, and is mentally as active as the average individual of 40.

A noteworthy feature of her case is that she can never leave the tube out without putting in a substitute at once, for fear of choking, the fistula, in spite of its age, still preserving its tendency to close.

In her 20's she spent two winters in Canada, crossing Lake Ontario in the mail sleigh on her way home. She married at about 28 and has had seven children, five of whom are alive.

Dublin.

ROBERT WOODS.

DIPHTHERIA IN OLD AGE.

DIPHTHERIA is essentially a disease of childhood, but cases may be met with in any age period, and, though relatively infrequent in old age, it is by no means as uncommon as the paucity of recorded cases would suggest. Fever hospital statistics understate the incidence, because, as one might expect, the tendency is for practitioners to treat aged patients in their own homes. In 1913 fourteen notifications relating to cases of diphtheria in patients of over 60 years of age were received in the metropolitan area, but only two of these cases were admitted to hospital. In the previous year nine such cases were notified, but none of them received hospital treatment. The following table is self-explanatory:

Cases of Diphtheria in the Fever Hospitals of the Metropolitan Asylums Board, 1895 to 1914.

Total number of cases (all age groups), 110,741.

		Males.	Females.	Total.
Aged 60 and upwards	...	15	21	36
Deaths	...	3	7	10

In early life diphtheria is slightly commoner and more fatal in the female sex. In old age both the incidence and mortality rate are much higher in females. With one exception all the cases I have been able to trace from the literature have referred to female patients. The following is an instance of diphtheria in a patient of advanced age.

A woman, aged 94, was admitted to the Grove Hospital in July, 1924. On admission an exudate covered both tonsils and there was slight bilateral cervical adenitis. The clinical diagnosis was confirmed bacteriologically, and she received 21,000 units of antitoxin. Five days after admission the throat was clean, and the subsequent course was uneventful. She had no paralytic sequelae, and except for a slight albuminuria there were no complications. She was discharged well after a stay of thirty-eight days in hospital.

In some of the recorded cases the exudate consisted of a small patch on a somewhat atrophic faucial mucous membrane. The false membrane showed little tendency to spread, and deliquescence was sluggish. Paralysis, noted in some of the cases, did not differ from the type observed in younger patients. The mortality must have been unfavourably influenced by the age of the patients and the consequent increased liability to intercurrent affections.

Laryngeal forms are very rare in old age, but their occasional occurrence has led Akesson to emphasize the importance of examining for the diphtheria bacillus in the laryngitis of elderly people. As J. D. Rolleston has pointed out, the prognosis in the laryngeal diphtheria of adults is grave on account of the likelihood of an extension of membrane to the bronchi and lungs. The laryngitis from which George Washington died, at the age of 67, was supposed by Bretonneau to have been diphtherial.

From the notes of a case recently reported by Muir it would appear that there is a possibility that some of the cases of rhinitis in the aged may have a diphtherial origin. The non-specific therapeutic value of horse serum is well recognized, and it is interesting to note that in the cases recorded by Birt and Keyes the administration of antitoxin was followed by the apparent cure of gout in one case and of a varicose ulcer in the other.

G. W. RONALDSON, M.D. Glas., D.P.H. Oxon.,
Assistant Medical Officer, Grove Hospital, London.

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