TREATMENT OF RINGWORM OF THE SCALP WITH THALLIUM ACETATE

BY

DAVID R. LEWIS, M.D., M.R.C.P.

HONORARY PHYSICIAN FOR DISEASES OF THE SKIN TO THE SWANSEA
GENERAL HOSPITAL; VISITING PHYSICIAN TO SWANSEA
MENTAL HOSPITAL

AND

W. ALFRED LLOYD, L.S.A.

M.O.H. LLANDILO RURAL DISTRICT

The economic situation created by the great war was probably responsible for the rapid development of an easier method of treating ringworm of the scalp in children than the older and more tedious one of x -ray therapy.

Since the post-war literature dealing with thallium acetate is so extensive it is unnecessary to give an elaborate account of its history. Soon after its discovery by Crookes¹ in 1861 it was isolated in 1862 in a pure form by Lamy,² who recorded its toxic properties. Thallium acetate became fashionable in the field of therapeutics, and was used to control the night sweats of the consumptive, and Combemale³ (1898) observed that his patients undergoing this treatment lost their scalp hair. In 1898 Sabouraud⁴ used thallium acetate for the first time as a depilatory agent in ringworm of the scalp. He used it both locally and internally, and later abandoned it on account of its toxic properties. In 1909 Cicero⁵ revived the subject of thallium therapy, and in 1918 published favourable reports on the uses of thallium acetate as a depilatory in ringworm. In the early days of the great war Buschke⁶ approached the subject, and has since published periodical reports on the results of his experiments with thallium in rats. In 1922 Buschke and his collaborators administered the drug in the treatment of tinea capitis in children, giving it by the mouth, in a sweetened solution, on an empty stomach. For successful epilation he found it necessary to use a minimum dose of 8 mg. of thallium acetate per kilo of body weight (nude), and further stressed the importance of local treatment during the process of epilation.

In this country Percival⁷ has used the drug extensively, and in 1930 published a detailed account of his results of thallium medication in fifty cases of ringworm of the scalp. He maintains that, apart from occasional manifestations of mild toxic symptoms, the patient appears perfectly normal. Recently Ingram⁸ has reviewed very lucidly the literature on the subject, particularly in reference to deaths from thallium poisoning, and has come to the conclusion that all the reported deaths have resulted from faulty technique in the administration of the drug. He believes that those who condemn its use as a depilatory agent in ringworm of the scalp do so from a limited acquaintance, and is convinced that, with care, the more the drug is used the less apparent will be the danger. The three deaths recorded by Lynch and Scovell¹⁰ cannot be accepted as a valid objection to its use, for they were, unfortunately, due to an error on the part of the dispenser. Apparently these deaths have created a deep impression on medical opinion in this country, and the drug has gained an evil reputation. The compilers of the new *British Pharmacopoeia* have ignored it entirely. We are still ignorant of its precise mode of action, and until our knowledge has increased we cannot lay down a hard-and-fast rule for its administration. Recently Vasarhelyi¹¹ and Buschke have published their investigations on the changes in the skin produced by thallium. They conclude that a local application of it can cause alopecia, and also slight inflammatory changes, and that the drug absorbed from the skin causes general thallium phenomena. Thanks to the patient work of Cicero and Buschke, the experimental stage has been successfully passed, and it is evident that thallium acetate is being used more and more in the treatment of tinea capitis in children. Our knowledge

of its elimination and rate of absorption is only partial, and although we have certain facts to guide us in its administration, our ignorance of its pharmacological action still awaits daylight.

Sabouraud regarded such toxic manifestations as tachycardia, cutaneous erythema, and subcutaneous haemorrhages to be the result of impurities in the preparation he used. Other early observers maintained that the lead contained in thallium was responsible for the toxic properties of the drug. Its toxic manifestations undoubtedly simulate those of lead to a marked degree. Like lead, it is a protoplasmic poison, and a comparison of the symptomatology is interesting. Both have a predilection for nervous tissue and are cumulative in action. The cramp-like abdominal pains, peripheral neuritis, and blurred vision of lead poisoning are frequently observed in thallium poisoning. The blue line so characteristic of lead absorption has also been observed in thallium poisoning. Adler¹² refers to the changes in the finger-nails observed as a late symptom of it. About the eighth week after administration he noticed in one of his cases a white horizontal band on each finger-nail and equally distant from the base of the nail. He mentions that this band could easily be distinguished from the white zones which are often observed in some other diseases. His observation is of interest in comparing the two elements, for one of us (D. R. L.) has observed similar bands to those described by Adler on the finger-nails in a case of lead poisoning. A few of the early writers found stippling of the red blood corpuscles in thallium poisoning, but latterly Testoni¹³ and other observers have failed to demonstrate stippling in their cases. The analogy between thallium poisoning and lead absorption is interesting, for it is a well-known fact that a moderate amount of lead in the system, although toxic, is not apparently harmful, and does not shorten life.

The fact that thallium is a protoplasmic poison must not be overlooked, and its administration must be carried out with care and vigilance, for it is certainly well known that the difference between the maximum therapeutic dose and the toxic dose is very small. Lynch and Scovell have objected to its use on the grounds that it might do permanent damage to the growing organism, but Percival and Ingram have found no such evidence in their extensive experience of the drug. They believe that the mild toxic manifestations observed after the proper administration of the drug are a passing phase, and of no significance.

RESULTS IN FIFTY CASES

Our report is of fifty cases of small-spored ringworm of the scalp which were treated by the oral administration of thallium acetate. Twenty of the treated children were inmates of an orphanage home in Carmarthenshire, and were under the medical supervision of one of us (W.A.L.). The opportunity of daily observation was valuable from the point of view of gaining first-hand information of the toxic manifestations or any other psychological disturbances. One of the children was an epileptic, and another had a spinal curvature. The ages of the children treated ranged from 4 to 12.

A routine medical examination was carried out, and particular attention was paid to the examination of the urine. The child was then weighed nude, and the weight recorded. With two exceptions every child was given by the mouth a single dose of a sweetened solution of 8.5 mg. of thallium acetate per kilo of body weight. We hesitated in giving the usual therapeutic dose in the cases of the kyphotic and the epileptic child. In the former a middle course was adopted, and we gave the child 5 mg. of thallium acetate per kilo of body weight, and a half-pastille dose of x rays immediately after the administration of the drug. The Kienbock-Adamson method was used in giving the x rays, and a half-pastille dose was given to the different areas instead of the full pastille dose. The epileptic child was given 7.5 mg. of thallium acetate per kilo of body weight. The parent or guardian was then advised to cut the hair short, if not already cut, and ordered to apply a 2 per cent. solution of iodine thrice daily

to the scalp for another four weeks. The patient was advised not to wash the scalp for the first fortnight. At the beginning of the third week the scalp was washed with soap-and-water. This is the method recommended by Ingram, and it proved a very satisfactory one, though not superior to the vigorous local application of a 10 per cent. sulphur ointment recommended by Percival. In three cases we found that even a 2 per cent. solution of iodine proved too irritating to the children, and a 10 per cent. ung. sulphuris application was applied daily for three weeks instead.

The scalp was epilated in every case except two, and in the latter the full therapeutic dose was not prescribed on account of their state of health. One of our failures was an epileptic, and the other had a spinal curvature. In the former, the drug produced no ill effects, and has not increased the frequency of the fits. Falling of the hair was first noticed on the twenty-fifth day, and the scalp was never completely bald.

In the child with a spinal curvature epilation was never complete, and for many weeks after the administration of the drug and x rays the bald irregular patches on the scalp presented a curious appearance. On the fifth day following the administration of the drug a scarlatiniform rash was noticed on the child's neck and face. On the eighth day the rash had disappeared, and the child complained of itchiness of the skin and pain under the heels. The child was somewhat lethargic for a few days. A rash was observed in three children.

Toxic symptoms were observed in 43 per cent. of our cases, and, with the exception of one child, were of a mild pseudo-rheumatic character. The commonest symptoms were malaise, lethargy, weakness, and loss of muscular power and pains, particularly in the legs. The lower limbs seemed to be most commonly affected.

One case only in the series gave rise to anxiety. He was a boy of 5, and on the eighth day a diffuse rash was noticed on his legs. On the eleventh day the rash appeared all over his body. The face and neck were swollen, and the legs were oedematous. The temperature was normal, and a trace of albumin was found in the urine. The child remained in bed for a week, and made an uneventful recovery. He weighed 15.9 kilos, and 15.9 c.cm. of a solution containing 8.5 mg. of thallium acetate per c.cm. was administered.

CONCLUSIONS AND SUMMARY

It is claimed that older children are more liable to show toxic manifestations. We found that no particular age period was exempt, and only a few of the children exhibiting toxic manifestations were confined to bed. They all made a complete recovery. All the children, except two, responded well to treatment, and fulfilled the usual tests for a cure. X rays and thallium acetate administration are the only two satisfactory methods known for treating ringworm of the scalp. Both have their firm adherents. X rays have proved their value, and the expert has produced perfect results. It must be borne in mind, however, that in less experienced hands they cannot be used without danger, and many partially bald heads still linger as a monument to faulty x -ray therapy in early infancy. The superiority of thallium acetate treatment over x rays is most obvious when an epidemic of ringworm of the scalp has to be combated. In the treatment of the twenty children from the Cottage Homes we were able to stamp out the disease, with the aid of this drug, in eighty-five days. With x rays it would have taken us a much longer time, and it would have also entailed much more labour. According to Percival, the average duration of treatment at Edinburgh, from the time of administration of the x rays till the cure of the disease, was 135 days. It is impossible in the average skin clinic in the course of an epidemic of ringworm to treat every case immediately by x rays, whereas thallium acetate can be given at once to every child as soon as the diagnosis is made. The children at the institution have been carefully watched (by W. A. Ll.) for six months, and nothing unusual has

been noticed in their physical or mental development. Although the new method may prove a snare to the unwary and has been severely criticized, our results have been particularly satisfactory. The children are healthy, vigorous, and mentally alert.

To summarize. Thallium acetate is a dangerous drug, and therefore requires careful technique in its administration. Like lead it is a cumulative poison, and must not be repeated for at least four months. Toxic symptoms are rarely severe, and even the severe case encountered in our series recovered without any sequelae. When properly administered it can be used with ease and safety in the treatment of ringworm of the scalp.

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THE POSTERIOR FOSSA COMPRESSION SYNDROME

BY

LAMBERT ROGERS, M.Sc., F.R.C.S.

ASSISTANT DIRECTOR OF THE SURGICAL UNIT, THE WELSH NATIONAL SCHOOL OF MEDICINE, CARDIFF

Having several times in the course of the past twelve years encountered a syndrome which, although it may occur from high generalized intracranial tension, appears to be particularly characteristic of rapidly increased intracranial pressure in the posterior cranial fossa below the tentorium cerebelli, I venture to draw attention to it in the hope that its more general recognition no lead to its effective treatment. If ineffectively treated the condition is fatal. The first case of which I had experience (when a house-surgeon) was due to a fracture of the base of the skull and ended fatally; others with a similar termination have also been related to me. Since recognizing the syndrome and its cause, I have been privileged to tide a patient through it.

THE SYNDROME

The patient collapses and respiration stops, while the heart continues to beat vigorously. If nothing is done the heart soon ceases to beat, the patient previously becoming more and more cyanosed. A failure of the respiratory centre evidently takes place; the cardiac centre being apparently less vulnerable to the effects of sudden compression, the heart action continues. Artificial respiration results in the diminution of the cyanosis, and patients have been kept alive for ten or twelve hours while artificial respiration has been kept up; but as soon as this has flagged the cyanosis has increased, the heart has slowed, and, when artificial respiration has finally ceased, the patient has died. Such a case was reported to me by Professor Sheen as having been met with in his