which at post-mortem examination the signs of dysentery are found and Sonne's bacillus is isolated from the intestine. Individual susceptibility rather than virulence of organism is the most probable explanation. Clinically the diagnosis has to be made from other acute infections, especially cerebrospinal fever, and poisonings; and, in infants, also from the convulsions of the tetany of rickets. Treatment can hardly be other than symptomatic.

Summary

Two cases are reported of children, aged 20 months and 4 years, who died of toxæmia due to Sonne dysentery in under twenty-four hours; and the few similar cases in the literature are reviewed.

It is a pleasure to acknowledge my indebtedness to the assistant deputy coroner of the County Palatine of Lancaster, Mr. A. L. Ashton, for permission to record the post-mortem findings in the two cases, and to Dr. A. E. Rayner and Dr. R. P. A. Rigg for access to the ward notes; and to thank also Major F. B. Smith for the use of the post-mortem notes in the first case, Dr. E. Pollak for the histological examination of the brain in the second case, Dr. W. F. M. Unger for assistance with translation, Dr. W. M. Scott of the Ministry of Health Laboratory for advice, and Mr. T. J. Shields, librarian at the B.M.A., for help with the references.

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COMPOUND HYPERTONIC SALT IN THE TREATMENT OF SEPTIC WOUNDS

BY

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Five years ago J. C. Lyth contributed an original article (*British Medical Journal*, 1935, 2, 903) on the value of hypertonic lotions in the treatment of infected wounds. After using his technique in a large and varied group of cases I had no hesitation in accepting the remarkable statistics relating to 1,096 patients which he summarized in the *Lancet* on February 3, 1940. Moreover, I confirm his conclusion that from the point of view of osmosis a 10% solution of sodium sulphate acts more rapidly and efficiently than similar saturations of magnesium sulphate or sodium chloride.

In several instances, however, I have been impressed by the failure of hypertonic lotions to prevent the spread of cellulitis, particularly in toxic patients with extensive wounds. During the past twelve months this finding has led me to combine varying concentrations of acriflavine with the sodium sulphate solution. Thanks very largely to the co-operation of Messrs. Crookes Ltd. I now employ a mixture of sodium sulphate and acriflavine in the form of a fine powder, which I have termed "compound hypertonic salt." By dissolving a measured quantity of the product in warm water a 10% sodium sulphate solution containing 0.1% acriflavine can be made ready for use in a few moments.

I am satisfied in the first place that acriflavine does not interfere in the slightest degree with the mechanical efficiency of the hypertonic sodium sulphate. Secondly, in a concentration of 1:1,000 acriflavine does not harm the tissues or inhibit the activity of leucocytes. The main advantage of this antiseptic dye is that it rapidly infiltrates

the wound margins and destroys most types of invading organisms. As a result spreading infections are promptly localized, sloughs separate more rapidly, and granulation and epithelization are stimulated to a far greater extent than by sodium sulphate alone. Although I have only twelve months' experience of compound hypertonic salt, the proved value of the product in recent casualties must excuse the prematurity of this memorandum.

Illustrative Case Histories

The following short case-histories may prove interesting to other practitioners, and in due course I would welcome their observations.

Case 1.—Male casualty aged 38, admitted 10.7.40 with lacerated wound on inner side of ankle, penetrating talonavicular joint. Wound margins and damaged tissues excised, no sutures, cavity packed with compound hypertonic solution, back-splint with foot-piece applied. Re-dressed four-hourly at first, now twice daily. Moderate fever for two days only. To-day, 15.7.40, no evidence of local inflammation, complete absence of pain, wound has granulated almost to surface level.

Case 2.—Male casualty aged 46, admitted with shrapnel wounds of left buttock (operation by Mr. Black); shrapnel removed, wound margins excised, sutured with drainage. Compound hypertonic solution applied on gauze pack twice daily. 15.7.40, wound has healed by first intention and patient is to be discharged to-morrow.

Case 3.—Male aged 59, admitted to hospital five days after onset of acute appendicitis. Temperature 103° F., pulse 130. Abscess in right iliac fossa had ruptured, causing general peritonitis. The appendix was not removed but three large corrugated rubber drains were inserted. At conclusion of operation large gauze soaks (compound hypertonic solution) were applied to the wounds, and this measure was repeated four-hourly. Although a faecal fistula arose and discharged for seven days, all wounds had granulated to skin level in three weeks and healing was complete in one month.

Case 4.—Male aged 29 sustained compound comminuted fractures of tibia and fibula ten days previously. Leg had been encased in "open" plaster and large doses of sulphapyridine (M & B 693) administered. Temperature varied between 104° and 101° F. Bone was protruding, the wounds were very foul, and after removing the plaster a diffuse cellulitis was found involving the tissues from the ankle to the knee. The leg was put up on a Braun splint, extension being secured by a Kirschner wire inserted through the os calcis. No incisions were made, and the leg was merely wrapped in gauze soaked in compound hypertonic solution, which was changed at four-hourly intervals. Within a week fever had subsided, all traces of cellulitis had disappeared, and the wounds were healthy. Complete healing occupied a period of three weeks from the beginning of the treatment. Bony union is now progressing satisfactorily.

Case 5.—Male aged 61 with acute retention due to prostatic hypertrophy. Urine very foul. Four days after suprapubic cystostomy the wound sloughed and there was cellulitis of the abdominal wall. The patient appeared gravely ill. Packs saturated with compound hypertonic solution were at first applied hourly because urinary escape was not confined to the tube. Within three days there was marked constitutional and local improvement. Large sloughs were shed, and eighteen days later the prostate was successfully removed.

Case 6.—Male aged 34 with left arm involved in machine belt forty-eight hours previously. Elbow-joint opened up, very extensive damage to skin and musculature, obvious sepsis. Amputation was discussed, but after suturing tendons and excising wound margins compound hypertonic solution was tested. Dressings were changed four-hourly, and the joint was irrigated twice daily with the same fluid. Fair-sized areas of skin became gangrenous and the temperature remained high for a week. Once the sloughs had separated improvement was rapid. Within three weeks of the beginning of treatment all wounds had granulated to surface level and most of the sutured tendons had held. The application of skin grafts secured healing with a useful range of movement at the elbow, wrist, and finger-joints.