ON THE EXTERNAL APPLICATION OF MAGNESIUM SULPHATE IN THE TREATMENT OF ERYSIPELAS.¹

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THAT the common and homely drug known as Epsom salts possessed any other property save the one usually associated with it was scarcely known up to within three years ago. The anæsthetic effects resulting from its subcutaneous application, however, induced Dr. Henry Tucker, of the Philadelphia General Hospital, to apply it for the relief of pain in local inflammatory conditions, with rather surprising results. For, apart from the relief of pain and discomfort, it was found that it controlled and eventually led to the cure of the inflammatory process. Numerous observations in gonorrhœal epididymitis and orchitis, gonorrhœal rheumatism, acute articular rheumatism, neuritis, &c., gave equally satisfactory results.² Erysipelas³ and cellulitis were the other affections in which a marked beneficial influence was observed from its local application. And further, on account of its antispasmodic and analgesic properties, magnesium sulphate has been administered by intraspinal, sub-arachnoid, and subcutaneous injections for the relief of spasms in tetanus, as also of the lightning pains of locomotor ataxy. Miller⁴ has reported 14 cases of tetanus so treated; 11 were treated with subarachnoid injections, and five of them recovered. The author says that magnesium sulphate brings about complete muscular relaxation. This prevents rapid exhaustion and enables the patient to take nourishment. The dose is 1 c.c. of a 25 per cent. sterile solution to each 25 lb. of the body weight of the patient. Paterson⁵ reports a case of tetanus, in which he used 10 c.c. of a 10 per cent. solution subcutaneously—5 c.c. in each thigh—four-hourly. The injections were found to be painful, but the spasms were greatly relieved. He thinks that probably larger quantities of a weaker solution would obviate the local discomfort of these injections.

It may be interesting to note in this connexion that magnesium sulphate, when it fails through some cause or other to act as a purgative after internal administration, gives rise to serious toxic disturbances. In a case reported by Neale⁶ it was observed that after taking an ounce of the salts no purging was produced, but there was stimulation of certain motor centres causing tetanic spasm of the face and arm, together with paralysis of the inhibitory fibres of the pneumogastric to the heart, paralysis of the muscular fibres of the stomach and bladder, and of the muscular coats of the blood-vessels, as shown by the absence of the radial pulse and general cyanosis.

In a further communication Dr. Tucker has described its effects in 19 cases of erysipelas complicated with alcoholism, acute nephritis, myocarditis, pneumonia, &c., with but three deaths, and in 35 uncomplicated cases without a single death. The latter recovered within two to seven days, pain and the usual local discomfort having been relieved in a few hours. No internal treatment was given. The treatment has been applied by him and others in nearly 700 cases of various forms of inflammation with uniformly good results, and he claims the following advantages for it in almost all cases:—

Firstly, the drug can be obtained at any country store, is easily made into solution, is inexpensive, non-toxic, and clean; it is also easy of application if the directions are properly followed.

Secondly, the patient promptly obtains relief from the distressing local symptoms usually present.

Thirdly, the temperature rapidly falls to normal usually during the second twenty-four hours, and does not rise again, thereby eliminating possible complications from fever.

Fourthly, internal medication is not indicated in uncomplicated cases, the only treatment being a milk diet for the first few days, or, to be more accurate, until the temperature reaches normal.

Method of application.—A saturated solution of magnesium sulphate in water (preferably strained through muslin) is to be applied round the limb or on the face as a mask, extending well beyond the inflamed area in 10–15 layers of gauze or a thin layer of absorbent cotton or lint, and covered with oiled-silk or wax-paper. The dressing should be wetted as frequently as it gets dry, about once in two hours. It should be removed once in 12 hours for inspection and immediately reapplied. The affected area should not be washed during treatment. Dr. Tucker says that the attendants complain of partial loss of sensation and tingling of the hands and arms lasting for some hours.

Mode of action.—No explanation is forthcoming as to how these effects are produced by magnesium sulphate. The editor of the *Therapeutic Gazette*, from personal experience and reports of other observers, whilst endorsing the utility of the treatment, that it certainly gives extraordinary results in the treatment of acute articular rheumatism, erysipelas, and the relief of pain associated with local inflammation, admits that the method, like several others in common use, is purely empirical, and that the local action of magnesium sulphate cannot be explained on any known experimental or other data. Nor is its osmotic influence adequate to explain these effects, as other salts having the same action do not bring about the same results. We must for the present at least be content with the empirical use of the method, leaving the explanation of its action to the future.

As erysipelas and cellulitis have been lately included among the infectious diseases that have to be received at the Arthur-road Hospital, I had occasion to give this method a fair trial in a limited number of cases. Erysipelas may be defined, in the words of a recent observer, as an acute inflammation of the epidermis due to the presence of one of the organisms of the streptococcus class, of which the streptococcus pyogenes is the most frequent example. Cellulitis is a strictly comparable inflammation of the cellular tissues, and when the inflammatory process involves both the epidermis and the cellular tissues the condition of cellulocutaneous erysipelas results. My observations extend to 72 cases only, seven of whom were moribund on admission and will therefore be excluded from consideration; 35 cases belonged to the cellulocutaneous type, several of them of long duration, with extension and deep suppuration and sloughing, especially of the upper and lower limbs. These cases, as was to be expected, did not respond well to the treatment. Of the remaining 30 cases, most of them were of erysipelas and a few of cellulitis. The solution of magnesium sulphate was applied according to the above directions, and it was found to have a marked effect in lessening the pain and in preventing further extension except in a very few cases of the severest type. No special internal medication was administered, except such as was necessitated by the complications present, such as pneumonia, exhaustion, cardiac weakness, &c. The improvement within a few hours after the application was extremely well marked in erysipelas of the face and head, with œdema in the eyelids, &c., the pain and swelling considerably lessening within one to three days with fall in temperature. In six cases, however, the inflammatory process was not controlled, and extended beyond the original area in spite of the treatment. A few illustrative cases will serve to demonstrate the action of the application.

CASE 1.—Erysipelas of the face and head; nose considerably swollen; duration four days. Immediate and steady improvement with fall in temperature from 103° F. to normal in two days. Discharged in 12 days.

CASE 2.—Post-operative erysipelas after mastoid operation; transferred from the Jamsetjee Jeejeebhoy Hospital on the fourth day of illness; extensive cellulocutaneous erysipelas invading the head, face, and neck. Much improvement in four days; subsequent extension downwards, involving the chest and back and both arms, with rise of temperature. Polyvalent antistreptococcus serum injected in addition: 280 c.c. in six injections, one each day (60 c.c., 60 c.c., 40 c.c., 60 c.c., 40 c.c., 20 c.c.). Rapid improvement thereafter. Convalescence tardy; discharged after seven weeks. The temperature chart shows remissions from 102° F. to 99° until the seventh day of illness, when the temperature came down to normal, rising again on the eleventh and fourteenth days to 101° and 102° respectively.

CASE 3.—Cellulocutaneous erysipelas involving both thighs and vulva; duration 15 days. Considerable relief with fall of temperature in four days; slight extension downwards, promptly controlled; discharged in three weeks. The chart shows that on the fourth day after admission the temperature came down to normal from 103·6° F. It rose again to 102° on the twentieth and twenty-second days of illness, and thereafter remained at the normal level.

CASE 4.—Cellulocutaneous erysipelas of face and neck; duration four days. Steady improvement and fall of temperature. After an interval

¹ A paper read before the Bombay Medical Union, Nov. 27th, 1910.

² The Local Use of Magnesium Sulphate Solution in Inflammation, by Dr. H. Tucker, *Therapeutic Gazette*, April, 1907.

³ Ibid., June, 1908.

⁴ American Journal of the Medical Sciences, October, 1908.

⁵ THE LANCET, April 2nd, 1910.

⁶ THE LANCET, August 15th, 1896.

of three days there was extension downwards to the chest, with elevation of temperature; compresses reapplied with good effect. Rapid convalescence; discharged in three weeks. The chart shows oscillations of temperature between 100° and 102° F. for six days corresponding to the extension of the disease to the chest.

The above four cases generally bear out all that has been claimed for this form of treatment. In almost every instance the immediate effects of the application of magnesium sulphate solution were extremely beneficial. Pain and swelling abated, fever decreased, and extension of the infection was controlled in the majority of cases. The results, however, have not been so uniformly good as Dr. Tucker's, inasmuch as advanced and neglected cases, as also cases of the graver type, so largely prevailed. In six cases, for example, the inflammatory process extended so rapidly, in spite of this treatment, that antistreptococcus serum had to be injected, but only one of them recovered. The quantity injected varied from 60 c.c. to 280 c.c. Excluding the above and the seven moribund cases there remained 59 cases with 13 deaths and 46 recoveries, equivalent to a case mortality rate of 22 per cent., as compared with 15.9 per cent. in Dr. Tucker's complicated cases.

On the whole, therefore, I can confidently recommend to notice and trial this extremely cheap and efficacious method of treatment of erysipelas and cellulitis.

Bombay.

Clinical Notes:

MEDICAL, SURGICAL, OBSTETRICAL, AND THERAPEUTICAL.

NOTE ON A CASE OF SCLEREMA NEONATORUM.

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THE rarity of sclerema neonatorum justifies the publication of the clinical notes of every case, since the pathology of the condition has not yet been definitely settled.

The child was one of male twins and was 12 days old when my house surgeon, the late Dr. H. B. Stephenson, asked me to see the case with him. The twins had been healthy when born and weighed 5 lb. each. They were breast fed. The mother, aged 40 years, had had 14 children (including one previous twin-birth), of whom 11 were still living, the death of the three others being due to scarlet fever, bronchitis, and convulsions respectively. The conditions under which the family lived were poor and sordid. The child in question was noticed to be "queer" on the tenth day by the "nurse"—a neighbour—who drew attention to the peculiar stiffness of the left leg and thigh. When first seen, the child was wrapped up in blankets close to the fire. There was a tinge of jaundice in the skin and its cry was feeble and high-pitched. It had fed well and continued to do so. Both legs and both thighs were stiff and rigid, no movement of any sort being observed. The abdomen moved with respiration, but the hands and forearms were also rigid and motionless like the lower limbs. The skin of the affected limbs was normal in colour but cold to the touch, although circulation was well maintained as observable in the nails of the fingers and toes. The skin felt like soft leather, but the underlying tissues were very hard, almost bony. No impression could be made on the skin which could not be pinched up from the underlying tissues, and pressure did not vary the hardness of the muscles. Passive movement in the affected limbs was obtained with difficulty, giving an unpleasant impression of possible fracture. The funis was normal. There was a small hæmorrhagic effusion, the size of a sixpence, below the left internal malleolus and a smaller patch in the middle of the sole of the right foot. A blood count was made but with great difficulty owing to the extremely rapid coagulation. The blood was dark in colour and flowed very slowly. The result was as follows: Hæmoglobin, 100 per cent.; red cells, 4,300,000; white cells, 7800. A differential count showed a normal lymphocytosis.

The child died on the fourteenth day, and a very limited examination was allowed four hours after death. The skin was tough, parchment-like, and difficult to cut; there was no exudation on cutting through skin or muscle.

In cutting the muscle a sensation was experienced as of drawing the knife through very stiff dough. All the muscle was very pale on section. No obvious abnormalities were noted. Pieces of skin, muscle, liver, and kidney were examined microscopically. The muscle shows a little segmentation and an occasional breaking up of the nucleus, but nothing else to comment upon. The other sections are practically those of normal tissue.

The muscle was sent to the Pathological Department of the University of Durham for analysis for fat. Professor R. A. Bolam reported as follows:—Muscle from thigh: weight of muscle, 0.16 gramme; weight of fat, 0.135 gramme; fat percentage, 84. Muscle from abdomen: weight of muscle, 0.395 gramme; weight of fat, 0.16 gramme; fat percentage, 40.5. Average fat percentage of normal muscle, 2.27.

The above facts would appear to show that sclerema neonatorum is not at any rate an inflammatory condition, while the extraordinary fat percentage in the muscle seems to point to a rapid chemical change which, however, does not appear to have much effect upon muscle structure.

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NOTE ON A CASE OF SLIDING HERNIA OF THE SMALL INTESTINE.

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THE patient, a negro, aged 25 years, was admitted to the Seamen's Hospital, Greenwich, for the cure of a right inguinal hernia. On dissecting away the coverings of the cord, what was taken to be the sac was separated out and opened, but was found to be only a serous-lined cavity which had no communication with the sac of the hernia. This latter was situated external to it and attached to it by a fibrous cord. The sac of the hernia could be made more prominent by pulling it down, and could be reduced entirely into the abdominal cavity. It contained something which felt like bowel, but it was impossible to reduce the contents without reducing the sac itself, thus showing that the bowel must be adherent to the sac wall. The hernia was of the oblique variety, the deep epigastric artery running along the inner side of the neck.

On opening the sac there was seen to be a coil of bowel adherent to the wall and a coil apparently of small intestine, but this coil had no mesentery, being only surrounded by peritoneum on three sides. On tracing it towards the middle line a mesentery gradually appeared, while in the opposite direction it remained in the same condition as in the sac until it ended in the cæcum. This, as far as could be made out through the limited opening in the abdominal wall, also had no mesentery. The portion of the ileum without a mesentery was about six inches in length and was bound down to the parietal peritoneum of the iliac fossa which had been dragged down into the hernial sac. There were no other adhesions present, the appendix was quite free, the peritoneum was perfectly smooth—in fact, there was nothing to suggest that the condition was the result of inflammation, and one must conclude that it was a congenital abnormality. The intestine being fixed to the iliac fossa, the coil in the sac was adherent posteriorly. The upper part of the sac was cut away and the upper cut edge of peritoneum stitched to the peritoneum reflected from inferior aspect of the ileum. The canal was closed by Bassini's method.

I cannot find any account of this condition either from the surgical or from the anatomical aspect.

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NOTE ON A CASE OF SUPPURATIVE PYLEPHLEBITIS.

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THE following case may be of interest since it records an instance of recovery from acute suppurative pylephlebitis.

The patient, a boy, 12 years of age, was under my care suffering from an attack of appendicitis. During convalescence and after the temperature had been normal for several days it ran up to 103° F., he had a rigor, and complained of pain, which was localised in the epigastric region. A smooth, well-defined swelling, very sensitive to pressure, became palpable in this region. A diagnosis of acute suppurative