preferable to lethane because one treatment properly carried out should cure every case. This substance will not, however, be available till after the war. Lethane will cure a large proportion of cases with one application, but two treatments at a week's interval will give certain cure. In order to obtain good results the details of the application of lethane should be carefully observed. Two or three teaspoonfuls of the oil are used for one treatment. The hair is parted, and 2 or 3 drops from the teaspoon or pipette are dripped on to the scalp. This is repeated in from 12 to 20 different areas all over the scalp. With the finger-tips the scalp is vigorously rubbed for two minutes to ensure equal distribution of the oil. Any oil which trickles down the forehead or behind the ears should be wiped off with cotton-wool and vaseline applied.

The following substances proved ineffective in the treatment of pediculosis: 20% solution of dettol, derbac soap, concentrated infusion of quassia, 12.5% formalin soap mixture (M.O.H. Memo., 1940), 0.1% aqueous solution of mercuric chloride, oils of cedar-wood, citronella, and lemon-grass, and lauryl thiocyanate.

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LOCAL EFFECTS OF INTRAMUSCULAR INJECTION OF SOLVOCHIN*

BY

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Solvochin is a soluble preparation of quinine, designed for intramuscular injection and supplied by the Camden Chemical Co. Ltd. According to Cooke and Wingfield (1944), 2 c.cm. contains $7\frac{1}{2}$ gr. of quinine base together with phenazone. The reaction is pH 7.2. It has been recommended by Cooke and Wingfield (1944) and others for the treatment of malaria, on the ground that intramuscular injection is painless; some hundreds of injections were given by these observers without any serious complication, although a tender inflammatory induration was once noted.

The present investigation was undertaken to study the action of this preparation upon the tissues at the site of injection and to compare it with those of mepacrine and of quinine dihydrochloride (Hawking, 1943, 1944). The technique was the same as that used in the previous studies. The solution in the ampoule of solvochin was diluted with sterile isotonic saline, 1 c.cm. being made up to 7.5 c.cm., so that 0.5 c.cm. contained 16.3 mg. of quinine base. This corresponded to 20 mg. quinine dihydrochloride in 0.5 c.cm. injected during previous studies (Hawking, 1944). Injections were made intramuscularly into the thighs and loins of rabbits and also subcutaneously on the abdominal wall. Altogether 14 intramuscular injections were made and 4 subcutaneous ones. Two control injections with 0.5 c.cm. normal saline were also made intramuscularly; no sign of local injury due to these control injections was found. The animals were killed after 1 to 8 days. The site of injection was inspected macroscopically, and pieces of tissue were fixed in formol-saline and studied by the usual histological methods, staining with haematoxylin and eosin and with haematoxylin and van Gieson.

Results

Macroscopic Appearances.—In the muscles of the loin there was a dark-red fusiform mass (necrosis) with a narrow yellow border (leucocytic reaction); typical dimensions were 3 cm. by 0.9 cm. by 0.6 cm. In the thigh the picture was more varied. In some cases there was a dark-red mass 2 by 1 by 0.8 cm. lying longitudinally in the surface of the muscles along the sciatic nerve; in other cases there were small punctate haemorrhages, or the surface of the muscles appeared whitish and roughened. The muscles of the rabbit's thigh are divided by many planes of loose connective tissue, and solutions injected into the thigh are usually distributed along these planes,

between the muscles rather than inside them. In the loin the muscles form a compact mass, and solutions injected are confined to the interior of the muscle. At the site of *subcutaneous* injection there was no macroscopic evidence of tissue reaction.

Histological Appearances.—In the loin there was an area of coagulative necrosis with variable amounts of haemorrhage as described above. At the margin of this area there was a fairly thin zone (1 to 2 mm.) of leucocytic reaction. On the first day after injection many of the leucocytes were polymorphs, and fibrinous fluid was sometimes present; after 5 to 8 days most of the leucocytes were large mononuclears, and granulation tissue with fibroblasts was present. After 8 days some of the necrotic muscle fibres were becoming calcified. In the thigh the amount of necrosis was variable. In some slides there were long areas of necrosis and haemorrhage as described above. In others the necrosis was limited to the superficial layers (2 to 6 fibres deep) on the surface of the muscles. Adjacent muscle fibres were shrunken and basophilic. The neighbouring connective tissue was moderately distended with fluid and lightly infiltrated by leucocytes. After 8 days granulation tissue was present. In the skin there was necrosis of the subcutaneous layer of muscle for a short distance, and in one case there was necrosis of the epithelium over a small area. The adjacent connective tissue showed a little fluid and a few leucocytes (small round cells).

Discussion

The lesions produced by the injection of solvochin containing 16.3 mg. of quinine base were indistinguishable in extent from those caused by the injection of a corresponding amount of quinine dihydrochloride, as seen in the previous study (Hawking, 1944).

Summary

Solvochin was injected intramuscularly and subcutaneously into rabbits. Necrosis of the muscle was caused at the site of injection. The lesions were indistinguishable in character and extent from those caused by the injection of a corresponding amount of quinine dihydrochloride.

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Medical Memoranda

Foreign Body in Lung for Thirty-one Years

This case is published not only for its own interest but to reinforce a plea for the more frequent use of the bronchoscope in diagnosing intrathoracic lesions. The passage of a bronchoscope involves comparatively little disturbance to the patient and can almost invariably be done under local analgesia. The presence of even gross sepsis is therefore no contraindication.

CASE REPORT

A man aged 67 was admitted to the West Norfolk and King's Lynn General Hospital under Dr. Holmes Watkins on Oct. 27, 1943. There was a history of old tuberculosis of the lung, but he had been quite well for many years. On Sept. 22 he began vomiting dark fluid, and a barium meal showed a large atonic stomach, but no evidence of ulcer or neoplasm. Screening of the chest revealed what appeared to be a cavity at the right base, and a skiagram showed a large patch of pneumonitis there. A profuse purulent sputum grew *Str. viridans*, pneumococci, and *Micrococcus catarrhalis*. No tubercle bacilli were seen.

On Nov. 3, at Dr. Watkins's request, I undertook a bronchoscopy. Premedication was by omnopon and scopolamine, and in addition he was given an amethocaine hydrochloride pastille to suck 20 minutes beforehand. Under cocaine analgesia the bronchoscope passed quite easily, and when it entered the right bronchus a well of pus was seen. This was aspirated and a dark foreign body was seen lying across the bronchus about 4 cm. down from the bifurcation of the trachea. It was removed without great difficulty and found to be about three-quarters of an inch of the vulcanite mouthpiece of a pipe.

Questioned subsequently, the patient recollected an accident in 1912, when he fell from his bicycle and his pipe was broken in his

* A report to the Malaria Committee of the Medical Research Council.