

triethiodide the paralysing effects of the drug had completely disappeared at the end of 20 minutes. No difference in the disappearance of paralysing effects was noted between those cases given the drug alone and those who received it in combination with thio-pentone sodium.

### Description of Fit

When we had judged that sufficient relaxation and paralysis had occurred—usually within three to four minutes—a shock was given.

A fit was judged to be good by the flickering of orbicular and labial musculature; the arms and legs could be freely moved during the time the patient was in the "tonic" stage of the convulsion. In a somewhat less satisfactory fit the flexion of arms and legs could be easily overcome. On a few occasions apnoea was a little prolonged and the patient became cyanosed; oxygen and slight manual assistance to breathing soon overcame this, and natural respiration quickly returned.

### Toxic Effects

No bronchospasm occurred after over 90 injections of this drug. There was no marked sweating, and on only one occasion did we see pallor. Slight areas of erythema with weal formation were noticed around the site of injection on several occasions, and twice a fleeting erythema occurred over face and chest. It is of interest to note that one patient who had been receiving E.C.T. with D-tubocurarine before gallamine triethiodide was introduced presented an extensive rash on face and chest and a large urticarial weal with an area of erythema 4 in. (10 cm.) in diameter around the site of injection on each occasion, but on changing to gallamine triethiodide only a very small weal with an area of erythema  $\frac{1}{2}$  in. (1.25 cm.) in diameter occurred at the site of injection, and there was no generalized rash. This difference in reaction may be explained by the greater tendency of the natural product to cause histamine release. The use of gallamine triethiodide had no adverse effects on kidney function or blood picture in those cases tested.

### Conclusions and Summary

Gallamine triethiodide ("flaxedil") was given to two men and ten women suffering from various physical conditions (hypertension, severe rheumatoid arthritis) and about to undergo electric convulsion treatment.

Dosage was determined in each case by studying the loss of power of various muscle groups: the neck muscles failed first, the hand grip relaxed just before the onset of intercostal paralysis.

After the induced fits, which were in no way impaired, recovery was rapid and complete within 20–30 minutes of the full dose.

The drug produced no fall in blood pressure, and there seemed to be fewer side-effects than with D-tubocurarine. A mild cyanosis from temporary apnoea occurred in several cases.

In two patients paralysis from gallamine triethiodide was completely abolished in 10–15 minutes by the injection of 1 mg. neostigmine.

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## STERNAL MARROW CULTURES IN TYPHOID FEVER

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The only absolute proof that a patient is suffering from typhoid fever is the isolation of the organism. The widespread use of prophylactic injections of typhoid vaccine has to some extent lessened the value of *Salm. typhi* H and O agglutination. For this reason any method which will increase the number of cases yielding positive cultures should be explored.

The use of sternal marrow puncture for the detection of the organism has been stressed by several workers (Gerbasi, 1939; Ling *et al.*, 1940; Piaggio Blanco *et al.*, 1942). Gerbasi claims credit for the first systematic study of typhoid infection in children by examination of the bone marrow. He later used the method successfully in adults. He states that sternal marrow cultures often remain positive throughout the course of the illness even when other tests are negative. The bacillus may or may not appear in the blood during the initial febrile period, but it is a constant finding in the bone marrow, disappearing during the advanced stage of the disease or during recovery. He believes that the organism becomes fixed in the bone marrow and appears in the blood only in recurrent and temporary "spurts."

During a recent outbreak of typhoid fever at Evaton, Transvaal, 40 Bantu patients were admitted to Baragwanath Hospital under our care. We had, therefore, an excellent opportunity of testing these observations.

### Methods

In order that there should be no doubt about the diagnosis in these cases, no case has been included which did not conform to one or more of the following criteria: (1) a positive blood culture; (2) a positive sternal marrow culture; (3) a urine or stool specimen containing typhoid bacilli; (4) a post-mortem examination

with findings considered pathognomonic of typhoid infection; and (5) a significant or rising agglutinin titre with clinical features suggestive of typhoid fever.

H agglutination to a titre of 1 in 100 or O agglutination to a titre of 1 in 200, or both, have been used as minimum diagnostic titres. These titres conform to the minimum diagnostic titres suggested by Lewin (1938) for use on the Witwatersrand.

In order to isolate the organism from the bloodstream, blood was withdrawn by venepuncture and immediately inoculated into ox bile and nutrient broth. Simultaneously, sternal marrow puncture was performed according to the usual standard technique (Wintrobe, 1942) and the blood thus obtained inoculated into ox bile.

### Results

Sternal marrow puncture was performed on 28 patients. (Those under the age of 10 were not subjected to sternal puncture, although no valid contra-indication exists against this diagnostic method in this age group, provided they are adequately sedated.)

A positive marrow culture was obtained from 18 cases (64.3%). In five of the 28 (17.9%) the marrow culture was positive when blood culture, done simultaneously, was negative. Twenty-one patients (52.5%) yielded positive blood cultures during some stage of their illness. In no instance was blood culture alone positive.

These results are lower than those quoted in the literature, but it is possible that with a greater number of examinations of the marrow on individual cases and on a larger number of patients a greater percentage of positive results would have been attained. Ling *et al.* (1940) performed marrow cultures on 38 patients suffering from typhoid and paratyphoid fever. Of 110 marrow cultures and an equal number of blood cultures done simultaneously on the 38 patients, there were 44 instances in which marrow culture produced the organism while blood culture was negative, and only twice was blood culture alone positive. Piaggio Blanco *et al.* (1942) isolated *Salm. typhi* from the marrow in 42 (93.3%) of 45 cases, while in only 27 (60%) was a positive culture obtained by examination of the blood.

### Summary and Conclusions

The value of sternal marrow culture in the diagnosis of typhoid fever is stressed. Positive cultures were obtained from 18 out of 28 cases. In five instances marrow culture was positive when blood culture, performed simultaneously, was negative. In no instance was blood culture alone positive.

It is suggested that sternal marrow puncture be more extensively used in the diagnosis of typhoid and paratyphoid infections.

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## Medical Memoranda

### Some Cases of Poliomyelitis in a Country Practice

It is a common belief that one case of poliomyelitis, or, as I suppose, of paralytic poliomyelitis, is not followed by another in the same household. Another prevalent opinion is that the motor loss is at a maximum when the paralysis appears. Recently I have had reason to relinquish both these cherished beliefs.

#### Case Reports

On September 9, 1950, Mrs. A., a young married woman of 28, came to stay on holiday with her brother, Mr. B., who was a railway porter, 24 years old, with a young wife and child. The patient had been vomiting a little for several days, and on the evening of September 10 had a shivering attack and a headache. I visited her and found her temperature to be 102° F. (38.9° C.). She was a fortnight overdue with her period and so presumably in an early stage of pregnancy. The next day she still had headache and also a low backache, but only a mild pyrexia; and the day after that, on which she was not visited, felt so well that she went downstairs, but soon returned to bed as she had a queer feeling in her back reaching right up to her shoulders. That night she had a slight menstrual loss. When I saw her on September 13 the loss and backache might easily have been thought to be the premonitory signs of an early abortion, but I was surprised to find that her temperature had risen from its low level of 99° F. (37.2° C.) two days before, being now 100.5° F. (38.05° C.). My partner saw her next day, and, being unable to find the cause of the unaccounted pyrexia, treated her symptomatically with *tab. codein. co.* On September 15 I again called, and should have been told (as I was) that the veganin had done marvels and the patient was much better; but I happened to barge into the room and found the patient being supported by her husband upon a chamber-pot. He said he had to help her because she could not support herself.

On examination I found a weakening of the right quadratus femoris, the ankle-jerk absent on that side, and weakness of the muscles of the back. To get to the upright position she had to push herself up with her arms. Her respiratory movements, both costal and diaphragmatic, were quite good, although subsequently in the isolation hospital the paralysis spread to the arms and the diaphragm and there was some question of putting her in an artificial lung. However, she improved and was even getting some movement back, when, on September 23, she felt poorly again, was found to be pyrexial, and died from heart failure within a few hours, the virus having apparently flared up to paralyse the vagus centre.

On September 18 Mrs. B. developed a backache with pyrexia. She agreed to go to the isolation hospital, where a lumbar puncture was done. This being completely negative, she was sent home on September 21. That afternoon her year-old baby, who had been taken to his grandmother's home, was brought back to his parents; he was at once seen to have a left-sided Erb's palsy, and, when he was set to crawl, an obvious weakness of the left leg. According to the grandmother he had appeared to have nothing but a slight cold previously. I am happy to report that the paralysis in the child extended no further; but on September 30 Mr. B. retired to bed with a cold, and when I visited him on October 2 was found to have a paralysis of the left deltoid. He was sent to the isolation hospital,