**SULPHONAMIDES IN BACILLARY DYSENTERY**

**FURTHER OBSERVATIONS ON THEIR EFFECTS**

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The results of observations, made at a large desert general hospital in the Middle East (ME) during the 1943 dysentery season, on the relative efficacy of sulphaguanidine and sulphadiazine in bacillary dysentery have previously been reported (Scadding 1944). It was found that groups of patients treated with these three drugs showed no significant difference in duration of diarrhoea or of stay in hospital. The present paper records the results of sulphonamide treatment in bacillary dysentery during the 1944 season at the same hospital.

Because sulphaguanidine is the standard drug for the treatment of bacillary dysentery in ME, and because it is generally believed that sulphonamides have a specific beneficial effect in this disease, only comparative studies, continuing those carried out in 1943, were made during the earlier part of the season. First, succinyl-sulphathiazole and then sulphadiazine were tested against sulphaguanidine. Next, observations without controls were made on smaller doses of sulphadiazine. Finally, for reasons set out below, it was considered able until the final control series; the results of stool-records were kept by which it was hoped to estimate the relative severity of the illness, and the response to treatment. They are summarised in the tables. The criteria adopted to estimate the severity of dysentery were of diarrhoea before admission, (2) the number of stools in the 24 hr before admission, and (3) the incidence of fever. As the highest fever was generally present on admission, it may be included among the criteria of severity. The tables show that the severity of the disease, so estimated, remained almost constant throughout the season. The slightly lower incidence of fever towards the end of the season (table III and the last column of table IV) may be related to the end of the very hot weather.

**RESULTS OF TREATMENT**

The type of dysentery was similar to that of the previous season. It was mild, as shown by the control untreated cases reported below. No acute fulminating cases had ever been seen. Examination of all patients admitted to the dysentery wards with a history of less than five days' diarrhoea and with blood and mucus and a dysenteric exudate in the stools were included in the observed series. The exudate was bacillary, i.e., containing more than 50% of polymorphonuclear neutrophils—in 75–80%, of cases in all series and indefinite—i.e., containing less than 50% of polymorphonuclear neutrophils—in the rest. Facilities for culture were not available, and patients treated with sulphadiazine in 99 cases in this series are shown in table IV.

No complication, renal, gastric, exanthematous, or other, of sulphonamide treatment developed throughout the investigation.

**Comparison of results with succinyl-sulphathiazole and with sulphaguanidine**

Succinyl-sulphathiazole is even less well absorbed than the sulphonamides, and since a dose given daily or every other day is not likely to be excreted by the kidneys; it remains within the lumen of the bowel and is active there, in normal conditions, against coliform organisms (Poth et al. 1942). Hence, on the hypothesis which led originally to the introduction of sulphonamides in the treatment of dysentery, i.e., that a sulphonamide which is retained in high concentration in the bowel contents is likely to be effective—succinyl-sulphathiazole would be expected to be better than sulphaguanidine.

In June and July, 1944, alternate members of a series of 100 consecutive patients with bacillary dysentery were treated with sulphaguanidine, and the rest with succinyl-sulphathiazole. The latter drug was given in suspension in water in doses of 2 g. five times daily for 3 days, then four times daily for 4 days, the course being cut short if there was early improvement. The results are recorded in table I, which shows that, in the two groups, the incidence of fever and of diarrhoea were very similar; and that the only difference is that the sulphaguanidine-treated patients were in hospital, on the average, 1-3 days longer than those treated with succinyl-sulphathiazole, and showed a greater tendency to recurrence of diarrhoea during convalescence.

**Comparison of results with sulphadiazine and with sulphaguanidine**

Sulphadiazine presents a complete contrast to succinyl-sulphathiazole in being readily absorbed. Hardy and Watt (1944a) state that bacillary dysentery responds equally to sulphadiazine and other well-absorbed sulphonamides than to poorly absorbed sulphonamides.

In August and September, 1944, alternate members of a series of 100 consecutive patients were treated with sulphaguanidine, and the rest with sulphadiazine. The latter drug was given in 0-5 g. tablets in doses of 1-0 g. five times daily, reduced after 48 hr, if there was improvement, to thrice daily. The results are recorded in table II, which shows that, comparing this group with the others summarised in the same table, though the series was not directly controlled, the severity of the cases was similar, except that the incidence of fever was slightly less, the fever and the diarrhoea very slightly longer, and the stay in hospital, very slightly shorter than in the series treated with larger doses.

**Observations on treatment with smaller doses of sulphadiazine without controls**

In September and October, 1944, the effect of reducing the dosage of sulphadiazine was observed without controls. At first 1-0 g. five times daily was given, but this was reduced after 48 hr, if there was improvement, to thrice daily. The results are recorded in table III, which shows that, comparing this group with the others summarised in the same table, though the series was not directly controlled, the severity of the cases was similar, except that the incidence of fever was slightly less, the fever and the diarrhoea very slightly longer, and the stay in hospital, very slightly shorter than in the series treated with larger doses.

**Concurrent series of sulphaguanidine-treated and control untreated cases**

In discussing the 1943 observations at this hospital, I remarked that a possible conclusion was that, in the mild type of dysentery treated, none of the three drugs—i.e., sulphaguanidine, sulphadiazine and succinyl-sulphathiazole—had any specific effect, though clinical impressions and the published experience of others were against this view (Scadding 1944).

The uniformity of the course of the disease in the untreated and treated series of investigations, in cases receiving varying dosages and various sulphonamides, both readily and poorly absorbable, brought this opinion very forcibly to mind, and made it clearly unnecessary to test the hypothesis that, under the conditions of the investigation and by the criteria adopted, no effect of the sulphonamides tested on the clinical course of the type of dysentery treated was detectable.

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**References**

Scadding 1944. It was found that groups of patients treated with these three drugs showed no significant difference in duration of diarrhoea or of stay in hospital. The present paper records the results of sulphonamide treatment in bacillary dysentery during the 1944 season at the same hospital.
Accordingly a series of strictly alternating sulphaguanidine-treated and control cases was arranged. The controls received a suspension of gr. 20 (1·3 g.) of calcium carbonate to the ounce, which was given in the same volume and frequency as the suspension of sulphaguanidine. This control suspension was chosen because it closely resembles one of sulphaguanidine, and because it can reasonably be supposed that such a small dose of the substance can have no appreciable effect on the course of the disease. To avoid the danger of leaving a seriously ill patient untreated with a possibly beneficial drug, advantage was taken of the fact that it had been shown that sulphadiazine is at least as effective as sulphaguanidine, and it was ruled that if any patient on either suspension about whom any anxiety was felt should cease taking the suspension and be given sulphadiazine.

Soon after this series was started it became possible to perform routine stool-cultures. These were done in 99 of the 133 cases. During 10 days of the total period the overheating of an incubator seriously reduced the number of isolations; this affected the results of about a third of the cultures performed. Nevertheless, there were 45 isolations, distributed among the various bacterial types as shown in Table IV. The distribution is very similar to that observed in ME in 1945 cases by Van der Knaap and Weller (1945).

It will be noted that the bacterial types are almost evenly distributed between the treated and the control groups.

Table III sets out the results obtained in this strictly controlled series. Further, the figures for the cases in which the age of the patient on admission was less than 6 months from the stool set out separately; there were 17 of these in the treated and 17 in the control group.

The table shows that the cases in the two groups were of comparable severity. The control group of 67 patients had a mean time of 5·0 days after admission, remained in hospital for a mean time of 12·3 days, and those who were febrile remained so for a mean time of 2·3 days after admission; whereas the corresponding figures for 66 patients treated with a mean dose of 72 g. of sulphaguanidine in 4 days were 4·4, 10·8, and 1·7 days. One patient in each group was thought to be due to a Flexner strain in which 89 patients treated with sulphaguanidine had any influence whatever on the course of the disease; the mean total duration of diarrhoea or in amelioration of symptoms was noted, though there was a reduction in the convalescent carrier rate.

The absorbable sulphonamides have been considered elsewhere in this paper. The following conclusions workers: for instance, sulphapyridine by Reitler and Markberg (1941), Masefield (1941), Pauley (1942), and Swyer (1943), and sulphathiazole by Ferriman and Mackenzie (1944)

Succinyl-sulphathiazole has been reported on favourably in uncontrolled observations by Poth et al. (1942), and by Clay (1943). Jamieson, Church, and Watt (1944a) have found in a series of not as a rule severe infections, 75% with Flexner strains and 20% with Sonne, that stools were normal in 100 patients treated with succinyl-sulphathiazole in an average of 5·0 days, in 50 treated with chalk in 6·0 days, and in 50 treated with aperients in 6·5 days.

DISCUSSION

Many favourable reports on the action of sulphonamides in bacillary dysentery have been published, but few with adequate controls. Good results in uncontrolled series of cases treated with sulphaguanidine have been claimed by Marshall et al. (1941), Lyon (1941, 1942), Fairley and Boyd (1943), and Watt (1944). It will be noted that the control cases were in hospital of patients with bacillary dysentery in 1940 was 12·7 days and in 1943 was 11·6; the difference is statistically significant, but he considered that since the evidence seems very conclusive no conclusion can be drawn from only 6 cases. The 3 in the control series had formed stools in 12, 11, and 18 days, and were in hospital 21, 30, and 34 days, and the last of these was thought by his colleague Olle who had previously received sulphaguanidine; whereas the 3 in the sulphaguanidine-treated series had formed stools in 5, 7, and 7 days, and remained in hospital 9, 26, and 12 days. But the severity of the control cases on admission was greater; the average number of stools in 24 hr before admission was 22 and their average temperature on admission 101·4°F, whereas the figures for the treated cases were 15 and 99·3°F. Thus no definite conclusion can be drawn, especially as very great variations in the severity of Shiga infections are to be observed in this area; though the evidence seems especially suggestive that in this type of case the sulphonamides were beneficial. In this connexion it is interesting to note that Gard (1943) regarded a duration of diarrhea for an average of 11·5 days in 25 sulphaguanidine-treated cases of Shiga dysentery as a good result of treatment.
TABLE I—CONCURRENT SERIES OF CASES TREATED WITH SUCCINYL-SULPHATHIAZOLE AND OF CASES TREATED WITH
SULPHAGUANIDINE (JUNE-JULY 1944)

<table>
<thead>
<tr>
<th>Table</th>
<th>Uncontrolled</th>
<th>Concurrent</th>
<th>Sulphadiazine (6 g. daily)</th>
<th>Sulphaguanidine (6 g. daily)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total no. of cases</td>
<td>50</td>
<td>50</td>
<td>50</td>
<td>50</td>
</tr>
</tbody>
</table>

Severity

<table>
<thead>
<tr>
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<th>Sulphadiazine (6 g. daily)</th>
<th>Sulphaguanidine (6 g. daily)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean duration before admission (days)</td>
<td>2.1</td>
<td>2.1</td>
<td>2.3</td>
<td>2.5</td>
</tr>
<tr>
<td>Mean no. of stools in day before admission</td>
<td>13.0</td>
<td>13.7</td>
<td>12.2</td>
<td>11.5</td>
</tr>
<tr>
<td>Fever: percentage febrile</td>
<td>80%</td>
<td>86%</td>
<td>80%</td>
<td>84%</td>
</tr>
<tr>
<td>Mean maximum recorded in febrile cases</td>
<td>99.8°F</td>
<td>100.1°F</td>
<td>100.4°F</td>
<td>100.0°F</td>
</tr>
</tbody>
</table>

Results

<table>
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<th>Sulphadiazine (6 g. daily)</th>
<th>Sulphaguanidine (6 g. daily)</th>
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</thead>
<tbody>
<tr>
<td>Mean duration of fever in febrile cases (days)</td>
<td>1.6</td>
<td>1.7</td>
<td>1.2</td>
<td>1.6</td>
</tr>
<tr>
<td>Mean duration of diarrhea after admission (days)</td>
<td>3.5</td>
<td>3.4</td>
<td>3.9</td>
<td>4.3</td>
</tr>
<tr>
<td>Mean stay in hospital (days)</td>
<td>10.2</td>
<td>11.5</td>
<td>11.6</td>
<td>12.3</td>
</tr>
<tr>
<td>Recurrent diarrhea during convalescence</td>
<td>nil</td>
<td>3 cases</td>
<td>1 case</td>
<td>2 cases</td>
</tr>
</tbody>
</table>

Dosage (grammes)

<table>
<thead>
<tr>
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<th>Sulphadiazine (6 g. daily)</th>
<th>Sulphaguanidine (6 g. daily)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum</td>
<td>14</td>
<td>31.5</td>
<td>8</td>
<td>30</td>
</tr>
<tr>
<td>Maximum</td>
<td>51</td>
<td>113.5</td>
<td>27</td>
<td>112</td>
</tr>
<tr>
<td>Mean</td>
<td>38</td>
<td>80.5</td>
<td>17.4</td>
<td>69</td>
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Duration of treatment (days)

<table>
<thead>
<tr>
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<th>Concurrent</th>
<th>Sulphadiazine (6 g. daily)</th>
<th>Sulphaguanidine (6 g. daily)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Maximum</td>
<td>5</td>
<td>8</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>Mean</td>
<td>...</td>
<td>4.3</td>
<td>4.5</td>
<td>4.0</td>
</tr>
</tbody>
</table>

Further treatment with sulphadiazine

<table>
<thead>
<tr>
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<th>Concurrent</th>
<th>Sulphadiazine (6 g. daily)</th>
<th>Sulphaguanidine (6 g. daily)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>...</td>
<td>...</td>
<td>1 case</td>
<td>1 case</td>
</tr>
<tr>
<td>II</td>
<td>...</td>
<td>...</td>
<td>nil</td>
<td>nil</td>
</tr>
</tbody>
</table>

Note: *4 cases in the succinyl-sulphathiazole and 1 in the sulphaguanidine series in which the stay in hospital was extended because of another disease were omitted in calculating these figures.

In computing these figures, 1 patient in the treated and 2 in the control group whose stay in hospital was prolonged because of unrelated conditions are omitted.

Hoagland et al. (1943) report uniformly good results in the treatment of carriers of Shigella paradysenteriae (Flexner and allied strains) with sulphaguanidine and succinyl-sulphathiazole; Barker (1943) had some difficulty in controlling Flexner carriers with succinyl-sulphathiazole; Fairbrother (1944) speaks with some reserve of the results of attempts to clear carriers of dysentery bacilli with sulphaguanidine if stringent tests of clearance are applied; while Sandweiss (1944), comparing 33 carriers treated with phthalyl-sulphathiazole with 39 untreated carriers, states that the drug did not appear to influence the carrier state, and that in fact a higher proportion of his treated cases continued as carriers.

Thus, there is still no agreement about the value of sulphonamides in dysentery. And the interpretation of the data here presented is difficult. The following statements seem permissible:

1. In a mixed group of dysenteries, presumably due to several strains of bacilli, sulphaguanidine-treated cases showed a slight advantage over controls in mean duration of diarrhoea and of stay in hospital, but the differences were not statistically significant. It may be that an effect on a few more severe cases was being masked by dilution with a large number of mild self-terminating cases, because (a) in a group of 34 mild Flexner infections, equally divided between the treated and control series, no clinical effect of sulphaguanidine could be demonstrated; and (b) in 6 Shiga infections there was very suggestive evidence that sulphaguanidine and sulphadiazine were beneficial, though the small number of cases observed permits no definite conclusion.

TABLE IV—BACILLARY TYPES ISOLATED IN 99 CASES OF THE SERIES SUMMARISED IN TABLE III

<table>
<thead>
<tr>
<th>Isolations</th>
<th>Total</th>
<th>Sulphaguanidine-treated</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of cases in which stools were cultured</td>
<td>99</td>
<td>44</td>
<td>45</td>
</tr>
</tbody>
</table>

The figures in parentheses indicate the percentages of the total isolations constituted by each bacterial type.
In a similar mixed group of dysenteries comparative observations between sulphaguanidine and succinyl-sulphathiazole, and between sulphaguanidine and sulphadiazine. A comparison in the treatment of flexner's bacillary dysentery showed differences in mean duration of fever, of which the evidence presented is not conclusively in favour of any sulphonamide, it favours, if any, the readily absorbable more than the poorly absorbable ones.

**SULPHADIAZINE IN CHRONIC BACILLARY DYSENTERY**

Where statistical evidence is so equivocal, it is perhaps permissible, even though dangerous, to mention clinical impressions. I have been impressed by a number of cases in which sulphadiazine has seemed to cut short a long-continued bacillary-type dysentery on which the poisoning sulphonamides had had no effect. The following brief case-records illustrate this point.

**CASE 1.**—A man, aged 44, was admitted with a history of intermittent diarrhoea with blood and mucus for 2 months. Microscopy of the stool showed bacillary exudate; from a culture at a later date no pathogens were isolated; many examinations for Entamceba histolytica were negative. He received a course of 150 g. of sulphaguanidine in 8 days without effect; 23 days after admission he was still passing 3 stools daily with blood and mucus.

_Sigmoidoscopy_ showed gross thickening and redness of the mucosa, with many submucous hemorrhages, and much mucopus. He then received 62 g. of succinyl-sulphathiazole in 7 days; no definite benefit followed this, and 55 days after admission a second sigmoidoscopy showed no appreciable change; however, there was then given sulphadiazine 5 g. daily for 7 days. Immediate improvement followed; the stools were reduced to 1 or 2 daily, usually with mucus. Sigmoidoscopy 80 days after admission showed only slight thickening and hyperemia of the mucosa. He was discharged to convalescent depot 86 days after admission, the stools then being normal, once daily, with only occasionally a little mucus. The condition has subsequently relapsed and once more responded to sulphadiazine.

**CASE 2.**—An officer, aged 29, was admitted with a history of 14 days' diarrhoea, 5–6 times daily, with blood and mucus. Sulphaguanidine was given in the usual doses for 4 days with no effect. _Sigmoidoscopy_ after this showed general thickening and redness of the mucosa up to 3 in., but above this was normal. He was still passing loose stools with some blood and mucus 26 days after admission, and an indefinite exudate was seen macroscopically. 27th to 35th day he received sulphadiazine 5 g. daily; after the second day of this treatment the stools became normal and remained so until he was discharged fit on the 43rd day after admission.

In the following case a patient with bacillary dysentery developed arthritis while receiving sulphaguanidine, and both the dysentery and the arthritis responded well to sulphadiazine.

**CASE 3.**—A man, aged 23, was admitted with a history of 3 days' diarrhoea with blood and mucus; 25 stools in 24 hr before admission. Microscopy of the stool showed indefinite exudate. Sulphaguanidine was started in the usual doses. On the 3rd day of treatment the right knee became swollen and painful, and temperature rose to 100° F. On the following day the other knee was swollen, temperature 100-5° F, and 10 stools with blood and mucus had passed in 24 hr. From the 27th to 35th day he received sulphadiazine 5 g. daily; after the second day of this treatment the stools became normal and remained so until he was discharged fit on the 43rd day after admission.

In the following case a patient with bacillary dysentery developed arthritis while receiving sulphaguanidine, and both the dysentery and the arthritis responded well to sulphadiazine.

**CASE 4.**—A man, aged 23, was admitted with a history of diarrhoea with blood and mucus; 25 stools in 24 hr before admission. Microscopy of the stool showed indefinite exudate. Sulphaguanidine was started in the usual doses. On the 3rd day of treatment the right knee became swollen and painful, and temperature rose to 100° F. On the following day the other knee was swollen, temperature 100-5° F, and 10 stools with blood and mucus had passed in 24 hr. From the 27th to 35th day he received sulphadiazine 5 g. daily; after the second day of this treatment the stools became normal and remained so until he was discharged fit on the 43rd day after admission.

In the following case a patient with bacillary dysentery developed arthritis while receiving sulphaguanidine, and both the dysentery and the arthritis responded well to sulphadiazine.

**CASE 5.**—A man, aged 23, was admitted with a history of diarrhoea with blood and mucus; 25 stools in 24 hr before admission. Microscopy of the stool showed indefinite exudate. Sulphaguanidine was started in the usual doses. On the 3rd day of treatment the right knee became swollen and painful, and temperature rose to 100° F. On the following day the other knee was swollen, temperature 100-5° F, and 10 stools with blood and mucus had passed in 24 hr. From the 27th to 35th day he received sulphadiazine 5 g. daily; after the second day of this treatment the stools became normal and remained so until he was discharged fit on the 43rd day after admission.

In the following case a patient with bacillary dysentery developed arthritis while receiving sulphaguanidine, and both the dysentery and the arthritis responded well to sulphadiazine.

**CONCLUSIONS**

The only definite conclusions that can be drawn from these and my previous observations (Scadding 1944) is that the absorbable sulphonamides, even in small doses, were at least as effective as, and possibly more effective than, the poorly absorbable sulphonamides in the treatment of bacillary dysentery of the type at present seen in this hospital. The effect of the poorly absorbable sulphonamides in general, no statistically satisfactory evidence was obtained, though the clinical impression that severe and some chronic cases benefited, especially from moderate doses of sulphadiazine, was strong. The observations were relevant only to the therapy of the individual case; the important question of the effect of sulphonamides on the carrier state was not investigated.

**SUMMARY**

The therapeutic effects of sulphaguanidine, succinyl-sulphathiazole, and sulphadiazine have been investigated in observations on 390 unselected cases of acute bacillary dysentery.

The disease was on the whole of a mild type. A series of 67 control cases were treated by rest and diet only, each case was modified, with 1 case making no progress but 21 g. daily of sulphaguanidine, of which it is known that over 50% may be excreted in the urine, is not very different from that produced by the small doses (3-5 g. daily) of sulphadiazine. On the hypothesis that prophylactic doses would be regarded as prophylactic rather than therapeutic, give as good results in acute bacillary dysentery as larger ones, and possibly better results than very much larger doses of the poorly absorbable compounds.

Estimations of the sulphonamide content of the blood were not possible in the reported series, but it seems likely that the blood sulphonamides in the group at least are in the region of 15 g. daily for 21 g. daily of sulphaguanidine, and of sulphadiazine respectively. On the hypothesis advanced above it would be expected that penicillin parenterally would be as effective as or more effective than either poorly or well absorbed sulphonamides in bacillary dysentery. A trial of penicillin, especially in severe cases, seems well worth while; this does not appear to have been tried in any of the cases reported here.
ADDITION

Since this paper was written a United States War Department Technical Bulletin (1944) has come to hand, recommending sulfadiazine in doses of 2 g. initially, followed by 1 g. four times a day, as the drug of choice in the treatment of bacillary dysentery.

I am indebted to the sisters and medical officers at various times in charge of the units for their cooperation, without which this work could not have been done; to Major L. G. Cook for the stool cultures; and to Lieut.-Colonel R. B. Scott for help with the statistical analysis.

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From a General Hospital, B.L.A.

THE CLINICAL EFFECT OF ALTERING THE VOLUME AND DISTRIBUTION OF THE BODY FLUIDS

This study was chiefly concerned with cases of fibrositis of the back and shoulders, but many other cases were seen in which other parts of the body were affected. These latter cases showed the same tendency to recur- rency and exacerbation in response to microscopical examination of the biopsy material, and trigger points were found in constant situations corresponding to the distribution of fibro-fatty tissue round tendon sheaths, bursae, and muscle insertions. It seemed therefore that a similar process of fibro-fatty tissue expansion might be responsible for the symptoms in this type of case also; accordingly they are included separately as chronic rheumatism in the accompanying table.

ACUTE AND SUBACUTE ARTICULAR RHEUMATISM

Most cases of acute rheumatism were of a benign type and of comparatively short duration. In some cases, however, articular pains started to recur in wet weather, whereas others merged into a condition clinically indistinguishable from chronic fibrositis. We repeatedly observed that the articular pain in acute and subacute rheumatism was referred from one or more trigger points near the joint and was not caused, as is generally assumed, by tension of the articular capsule or by pressure on the surrounding structures, which only often happens later in the disease. This can be confirmed by infiltrating these trigger points with procaine, which immediately relieves the so-called articular pain without affecting the effusion. Moreover, tense swollen joints are seen in painless conditions such as hydarthrosis and synovitis.

The observations show that the distinction between acute and subacute rheumatism and fibrositis is not so precise as is generally held, there being many points of resemblance between them. In view of these facts some cases of acute and of subacute articular rheumatism were also submitted to dehydration.

SCIATICA

In planning this experiment it was thought that cases of sciatica due to a prolapse of an intervertebral disc might prove suitable for a control series. The effect of dehydration was therefore tried on several cases, and it was found that, contrary to expectation, they tended to respond to the procedure in a characteristic manner, different from that seen in fibrositis.

FATTY TISSUE AND WATER METABOLISM

The fatty tissues have long been known to be connected in some way with the normal water storage of the body, although it has been impossible to merge it into a condition set to be available on this subject, except as it affects the hump of the camel.

Chiari (1910) has said that adipose tissue constitutes 18% of the weight of normal persons and is subject to many physiological and pathological variations, although...