

Smith (C.D.)

or

CASES OF
CHICKAMAUGA TYPHOID

TREATED AT

The Maine General Hospital,

presented
BY

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Physician to the Maine General Hospital.

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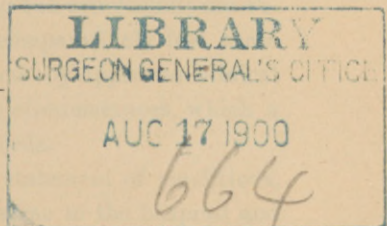
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BY

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Physician to the Maine General Hospital.



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Cases of Chickamauga Typhoid Treated at the Maine General Hospital.

The object sought by this paper is to place on record the clinical experience derived from an association with certain cases of typhoid occurring among the men of our Maine Regiment of Volunteers during August and September of 1898. Such experience from the management of any considerable number of these cases came only to physicians in the army service, or to those who occupied hospital positions in localities favorable for their reception, and while to the physician who began his practice in the sixties, or before, these cases would perhaps have exhibited little that was unique or unusual, yet because they presented an extreme type of typhoid not usually met with by the younger generation in domestic practice, it has seemed to the writer that there is an obligation upon those of us who had any unusual opportunities for observation, to utilize them and their results for general information. No attempt will be made to give a detailed description of cases; that would be the least useful method of presenting the conclusions drawn.

Although in number the cases were comparatively few, there was ample opportunity of studying them by approved clinical methods and under the most favorable circumstances which a well equipped hospital organization affords.

The effort has been made to make a statement of conditions, the clinical aspect of the cases as they came to the hospital and the conclusions drawn from a study of the daily bedside notes of the nurses, which have been used in the preparation of the

paper, supplemented by numerous private memoranda made by the writer at his daily visits.

From August 19, 1898, to January 3, 1899, fifty-four volunteers who had been in camp at Chickamauga were received and treated for various ailments, the direct results of their military service. Of this number forty-two proved to be typhoid. Seventeen of them were under the care of my colleague, Dr. Addison S. Thayer, in a ward already organized and equipped for the usual hospital work. The remaining twenty-five were under my own care in a ward never before used, and although hurriedly arranged in the face of a sudden call, yet most admirably organized and furnished, and put in complete working order within twenty-four hours.

This ward was in charge by day of a specially employed corps of four graduate nurses, with assistants from the regular hospital force. Night service was supplied from the under-graduates of the training school. One, and sometimes two, male nurse or ward master was on duty in each ward, as special service was required.

The first hospital train reached Portland August 19th, bringing twenty-four. This was followed August 26th, by another in charge of Assistant Surgeon G. M. Elliot, contributing sixteen; the others, to the number of fourteen, came in from time to time from the camp at Augusta or their homes.

The hospital care of these cases began with almost no definite information of their previous histories. Exhausted by a long railway journey, with minds weakened and dulled by disease, the men themselves contributed practically nothing of value bearing upon their illness prior to leaving Chickamauga.

In some instances, diagnosis was unmistakable; in others it was worked out only after several days of careful watching and study.

The first attention every man received was to be given something in the way of nourishment; milk, hot bouillon or broth were eagerly received, as well as water, for, almost without exception, they were ravenously hungry and complained of exces-

sive thirst. As rapidly as possible, the most serious cases receiving the emergency attentions at once, they were given much needed baths, supplied with clean clothing, and assigned to the several attendants. Twenty of the cases were apparently in the active stage of the second or third week; four proved later to have been in the invasive stage, and the remaining eighteen were in various stages of convalescence.

Their conditions when admitted varied greatly; most of them were able, with assistance, to manage to some degree their own movements. Six were in a condition of profound collapse. Of this number but one recovered; the others died in from thirty-six hours to five days after admission. Several were in stupor, so helpless that fecal and urinary discharges were involuntary, and many of these cases were having from five to ten discharges daily. The initial task of making them fit for reception and examination was no slight one.

All were emaciated, and gastro-intestinal disturbances were common even in the non-typhoids. Diarrhœa was general. Many of my patients were markedly deaf, and complained of intense headaches and nausea.

All who were conscious called incessantly for water and food, and complained bitterly of the refusal to allow them to select, in both quality and quantity, their own diet lists. Nor was this confined to the convalescent typhoids, of whom it would have been expected. As soon as possible began the work of diagnosis, so that the question of care and treatment might be, as speedily as possible, systematized and put in operation.

In the greater number of cases, typhoid was plain. In some diagnosis was delayed. Doubtful cases, in my ward, were submitted to the Widal test, and many specimens of blood were stained and examined in a fruitless quest for malarial organisms.

In every doubtful case, a positive reaction to the Widal test was later verified by the fully developed clinical features of typical typhoid. Two cases, in which there was reasonable suspicion of malarial infection from symptoms, and, so far as we could gather information, from the rather vague descriptions of

the patients themselves, are still not clearly defined in nature as I have reviewed them.

Typhoid was unmistakably present in one, but while presenting the general temperature wave as a whole, there seemed to be periodic variations, accompanied by slight chillness, sweating and aggravation of the nervous symptoms. Repeated examination of a considerable number of blood slips was entirely negative, and as no other physical evidences of malaria were present, I believe the case to have been only an erratic typhoid. The other was one of much perplexity. The blood at no time responded to Widal's test, but, on two occasions following a chill, examination revealed the presence of several pigmented red corpuscles, an absence of leucocytosis and the blood counts showed a fall to 3,000,000, with moderate loss of hæmoglobin. The temperature chart was not that of typhoid nor malaria. It would rise rapidly to 104° or 105°, following a marked chill; with temperature came nervous apprehension, then delirium much like that of delirium tremens, a delirium of fear. During the first ten days these attacks made their appearance at intervals of about 72 hours and quinine had no permanent influence in lessening their recurrence; then temperature would drop, retaining a level of 100° or 100° and a fraction. For three months these attacks occurred at gradually increasing intervals, and were still occasionally experienced at the date of his discharge—Jan. 3, 1899.

If these attacks were typhoidal relapses, the fact of their number and the periodicity of their occurrence is extraordinary.

It should in all fairness be stated that the later fecal discharges just before the patient left the hospital were typhoidal in character, appearance and odor.

But few hours' experience was needed to demonstrate that we were dealing not only with typhoid infection in men so debilitated as to have almost no resistant power, but that it was a typhoid of an exceptionally virulent type, erratic in its behavior and sudden in its changes. If I were to note one particular in which these cases differed from the disease as we

have become familiar with it, I should say it was in the precipitancy with which unfavorable conditions, especially collapse and persistent high temperature, manifested themselves, rendering the usual anticipation of symptoms and conditions a matter of such uncertainty as to create grave apprehension in cases seemingly mild.

I do not think that the gravity of the individual cases was under-estimated, but certainly we were unable, from the meagre information obtainable of personal histories, or pre-disposing causes, to justly estimate the extent to which individual resistance had been undermined. It is possible that the grouping of a number of severe cases of unusual virulence and our ignorance of their previous histories created a distrust of all of them; certainly, after the experiences of the first ten days, one would have been justified in a readiness to accept almost anything as a part of the apparent programme.

Nervous disturbance was pronounced in all the cases, and the circulatory, digestive and nervous systems were peculiarly susceptible to apparently trivial influences.

Often, without the slightest warning, patients would seem to lose their hold and the whole nervous mechanism become upset. In the milder type nervous disturbance was manifested by excessive irritability, apprehension and marked mental depression. In the severer cases, delirium came on early (in some it was present on admission) and was maniacal in character, necessitating the use of confining straps. Stupor was usually profound and coma-vigil a constant and marked feature.

The onset of one case was by profound stupor; the patient lying for four days with mahogany-colored flush upon the cheeks, half open eyes, insensible to his surroundings or the attentions of the nurse, as though narcotized. During this time the temperature remained at 99°. On the morning of the fifth day, it shot up rapidly, reaching 104° by night, delirium of violent type accompanying the fever in a few hours after its height had been attained. This patient was never conscious after the first day of admission, when his heaviness was begin-

ning; he died in convulsions as though from heat stroke, which indeed it was, eight days from his arrival; rose spots appeared abundantly the morning of his death. I saw no better example of the possible malignancy of this fever than in this case. I have had other patients show the same tendency, and it always presages an explosion of some kind.

A low nervous condition, incapable of improvement, characterized a few cases, who, judging from information derived from their friends or fellow patients, were alcoholics. The delirium of these cases was especially exhausting, persisting night and day, and sleep was difficult to obtain.

The circulatory phenomena were not unusual for typhoid. The dicrotic pulse and lowered arterial tension were common early and were persistent. The circulation was feeble in most cases, and exertion, sometimes even the unavoidable movement of the patient by the nurse, easily induced lividity of the lips and face, and clammy feeling of feet and hands was noticeable, especially in the first few hours after admission, before the sustaining effects of stimulation were apparent. As a rule, conditions were markedly asthenic. The heart muscle became easily and quickly exhausted, especially in the severe cases; and tendency to cardiac failure, in spite of most judicious stimulation, was frequent.

As a rule, the heart responded readily to any of the various stimulants, but was incapable of long-sustained action.

It was a common experience to make the morning round as I did, usually before 9 o'clock, and to receive favorable reports of quiet nights, circulations good and temperatures moderate, and again at 11 o'clock to find several, with little or no warning in a condition requiring the most active stimulation and assiduous attention to avert threatened collapse.

The symptomatology dependent upon the digestive system was variable except as to diarrhœa, which was, with one exception, a constant and troublesome feature of all the cases, in most of them frequent and so profuse as to be exhausting.

There seemed to be little doubt that this had been aggravated

by indiscretions in diet at Camp Thomas before infection, and by the misdirected attention of sympathetic friends on the way homeward, and at the station on their arrival.

During the first few days this condition entailed a tremendous amount of labor upon the nurses, and it was no uncommon experience to have calls for urgent attention coming from eight or ten patients at the same time.

Such a condition became a most serious matter by reason of its interference with anything like a continued contact of the discharges with disinfectants for any considerable period of time, and made such disinfection, as well as that of the persons of the patients and hands of the attendants, uncertain. It is, however, a remarkable fact that notwithstanding the extent of intestinal ulceration which must have existed, the records of the cases do not show, in all the forty-two, a single case of hæmorrhage from the bowels.

The temperature record was not remarkable for any number of extremes. A sudden rise to 107° in one case, just before death, being the highest, and 95° the lowest, recorded. The average height of rise was $103^{\circ}+$.

It was noticeable, however, that changes were apt to be extreme, from what would usually be regarded as trivial causes.

One patient, and not a very sick one either, having begun convalescence, showed a temperature curve rising from 97° in the morning to 100.2° at night, reaching 101.8° the next afternoon. On the third morning it was 100° . On the evening of the same day 95° . During the next two days there was a steady rise to 100.6° , with only a slight remission of $.6^{\circ}$; then a drop in one day to 96.4° ; then a sharp rise, extending through thirty-six hours, until the morning temperature stood at 103.6° , and that of the evening on the same day at 98.2° . Temperatures were taken at varying intervals, from every two hours to twice daily, according to the nature of the case.

This oscillation was not an unusual phenomenon at the beginning of convalescence, which in most of the cases was established more by crisis than lysis. As the time approached when

the morning decline might be anticipated, we learned to expect a sudden drop or a rapid decline, attended by much prostration, pallor and profuse sweating, the temperature zigzagging about the normal sometimes for a week, until it settled at a point a little below, usually remaining subnormal for several days, until the normal line was attained and kept.

With such symptoms one naturally looked for hæmorrhage, but in every case this was excluded by repeated high enemata of boiled water to see if any blood could be washed out, but none ever appeared.

During the first week or two after admission, sudden rises every second or third day disturbed us not a little, until we were satisfied that this variation was peculiar to the type of the disease or to some coincident condition undetermined, and learned to confidently await the drop to its average, which rarely failed to come.

Some of the charts showed strikingly this up and down variation in the regular line of progress.

Temperatures which began to rise in the third week usually did so abruptly, and persisted, rapidly destroying the vitality of the cardio-inhibitory and respiratory centers, death coming from exhaustion after violent delirium.

For example, a temperature which had been running at 103° each evening, would remain the same during the night, be a little higher the next morning, reach $104^{\circ}+$ by noon, and persist, in spite of all antipyretic measures, until the end came, rising rapidly just before death. In the face of this burning out of tissues, stimulation to degenerating heart muscle was utterly ineffectual.

These patients gave one the impression of cases of profound sepsis, and when the conditions just outlined were established, the prognosis was regarded as hopeless, although some of the men of extraordinary vitality made a brave and successful fight for life.

The complications noted were two cases of severe epistaxis, one necessitating frequent plugging. One of extreme jaundice,

without obstruction, regarded as a rare complication, with but slight liver tenderness, doubtless due to direct influence of the typhoid toxin upon the liver cells.

Bronchitis, marked in most of the cases, in two amounting to bronchorrhœa.

There were four cases of pseudo-membranous pharyngitis, shown by cultures to be due to staphylococcus infection. This is considered as usually a fatal complication. Three of these cases recovered; the death of the fourth can be so easily attributed to other conditions that it is difficult to estimate its influence upon the fatal issue.

There were five cases of bed sores, all existing upon admission, in one case upon both elbows.

There were several cases of boils upon the buttocks, lips and about the nostrils.

One case of orchitis, non-specific in character, occurred in the second week of convalescence.

Two cases of acute nephritis, both with marked hæmaturia, one with suppression.

One case of parotiditis, occurring two days before death in one of the collapse cases, undoubtedly by direct infection. Blood examination upon this patient showed it to be swarming with actively motile bacilli.

There was one case of marked purpura, and purpuric discoloration of the lower extremities was observed in several of the cases of low type.

Sequelæ noted included one case of rectal abscess, which was drained and packed and healed without difficulty.

One case of pleural effusion coming late in convalescence.

A notable feature of several cases was the prolongation, far into the stage of convalescence, of the mental disturbance, delusions and hallucinations persisting for weeks.

Of the forty-two cases of typhoid, nine resulted fatally, a percentage of 21 $\frac{3}{7}$. This excessively high rate, although only 2 $\frac{3}{7}$ higher than Murchison's record (Osler), is easily understood by an examination of the condition of these men when

admitted, and the length of time they were under treatment in the Hospital. Four never rallied from the collapse in which they were when taken from the train. One of them died within thirty-six hours, two within forty-eight hours and one within three days after being received. This latter had typhoid septicæmia. One died of exhaustion from delirium and high temperature in forty-eight hours. Another in stupor when admitted died on the eighth day, from the same cause. Another on the fifth day after admission, with mania. One with typhoid septicæmia on the seventh day, after having rallied a little from collapse, and one of suppression of urine on the seventeenth day. Eliminating seven cases which were practically moribund on admission, but two died with whom we had a fair chance of work. A mortality of 5.7 per cent.

No particular system or special plan of treatment was adopted. Indeed, there was such a diversity of demands upon therapeutic resources, the result of the erratic nature of the cases, that their management was essentially an anticipation of conditions and emergencies. Comparatively little reliance was placed upon antipyretic drugs.

Temperature was controlled by a wide variation of hydrotherapy, from simple sponge bathing with cold, tepid or hot water to the full immersion in the tub.

The latter procedure, after fair trial, seemed to be inadvisable by reason of the marked tendency to depression, and it was abandoned for sponging or packing. One of my own patients, a boy of 19, with a maximum temperature of 103° , could bear nothing but rapid sponging with water at 100° . Cold sponging or packing induced a dangerous tendency to collapse.

The most satisfactory application of water in my own ward was, first packing in hot, wet towels, to get as much hot blood to the surface as possible, then the application of towels wrung out in cooler water, gradually reducing its temperature, in some cases where well borne, although these were few, to about 50° . These applications were made first to the lower then to the upper extremities, and lastly to the trunk. Usually cold water

packs or the ice cap to the head were employed, always the latter in the badly delirious cases. By this alternate hot and cold packing, and the promotion of evaporation by fanning, the temperature would often fall 2°, sometimes more.

The most marked effect of hydrotherapy was in its quieting influence upon nervous irritability.

Nearly every case needed stimulation. Life was prolonged in several of the fatal cases, and saved, I am confident in some others, by the assistance of alcohol, strychnia and digitalis, which were the agents most employed. Their usefulness in a system of stimulation for the conditions of typhoid, as their effects were noted, seemed to be, for continuous effect, strychnia, especially in the alcoholics; brandy alone, or with strychnia for quick stimulation; whiskey or strychnia, or both, for non-alcoholics; and digitalis as an adjuvant to the other three.

Atropine was most useful at times, as a powerful stimulant to the respiratory center, utilized when circulation was feeble and respiration shallow and irregular, usually in combination with the other stimulants; in sudden emergencies alone, or with brandy.

Nitro-glycerine found a useful field as a conserver of cardiac energy by relieving peripheral resistance, when blood pressure was so high and arterial tension so marked as to impose additional burdens upon the heart muscle.

So far as possible, all medication was by the hypodermatic method; later in convalescence stimulants and other drugs were given by the mouth.

Few drugs are free from some objectional features, and while in general terms strychnia is to be regarded as a stimulant possessing a maximum of good and a minimum of poor qualities when judiciously employed, one criticism may be made upon its action in the cases under consideration. It was used freely, and I believe intelligently, always with due regard to the danger of over stimulation, yet I am confident that in some of the cases requiring frequent and persistent support, where alcohol was inadmissible, and where, because it gave better and more last-

ing results than digitalis, strychnia was demanded; it had a bad effect upon temperature, aggravating the tendency to excessive heat production. One of the normal physiologic attributes of this alkaloid is to increase the body temperature, and one was often confronted by a situation where stimulation was imperative, yet where it was no less desirable to check heat production and augment its loss. It was clearly a choice of evils, for the stimulation was almost sure to produce the very condition which gave rise to its necessity, and to steer clear was often a perplexing problem.

Attempts at intestinal antiseptics by drugs was for the most part disappointing; indeed, so far as the typhoid organism is concerned, it amounts to practically nothing. So far as gastric and intestinal flatulence could be controlled, a choice was made of salol, B. naphthol with bismuth, bisulphite of sodium, carbolic acid and turpentine, the latter by mouth or enemata.

This condition, frequently so distressing, was mitigated to a considerable degree by predigesting milk, or excluding it from the diet altogether.

Subgallate of bismuth and sulpho-carbolate of zinc were especially efficacious in checking diarrhœa.

Of all these agents for checking or preventing intestinal fermentation, my preference was decidedly for turpentine, an old, but by no means obsolete remedy. Warm water lavage of the large intestine was practiced freely and with excellent results. It removed easily, expeditiously, and, to the patient, comfortably, putrefactive products, and so lessened reabsorption, and when any considerable quantity of water could be retained it had a good effect upon renal and hepatic action.

The dietary consisted largely of milk in various forms, supplemented by broths, barley water and egg albumin, following a general plan of using concentrated proteid foods, having a minimum of residue, and in such quantities at each feeding as would insure the digestion of most, if not all, of it in the stomach.

Water was given freely, as well as iced claret, and the car-

bonated waters were especially useful in allaying thirst, and relieving nausea and gastric irritability.

Disinfection was carried out by the use of calcium chloride, carbolic acid, bichloride of mercury and formalin.

Any efficient disinfection depends less upon the particular agents or methods chosen from several efficient ones, than upon intelligent and thorough application of the one selected.

When obliged, as we were at first, to curtail the time during which stools could be kept in contact with the disinfectant, an endeavor was made to compensate for loss of time, by thorough mixing with stronger solutions and frequent and liberal flushing of the hopper, so as to ensure each time, so far as possible, removal of the material out of the soil pipes to beyond the house system.

The rules for personal hygiene of the nurses were most insistent, and to a faithful observance of them is to be attributed in large measure their immunity in the presence of an unusual amount of infection.

During the first week after their arrival on the hospital trains the morale of the men was exceedingly bad and greatly aggravated the ordinary difficulties of caring for such cases. After that, as a result of the patient, yet no less firm and determined management of the women nurses, they were brought under control, and showed a vast change for the better, most of them becoming tractable, appreciative and anxious to help in the work of lightening the labor of their attendants, which at times had been almost to the limit of endurance. I cannot express too strongly my appreciation of the faithful, unselfish and devoted work of the young women who cared for these cases. Their attention was unremitting, no labor was too exacting and no task too repulsive for their ready and cheerful service by day and by night. If ever the value of skilled nursing by trained hands was apparent it was shown in these fever wards.

Those of us who met these cases with the resources of a general hospital at our command, wonder what could have been the experience of our professional friends in the field.

I hope I shall never be obliged to look again upon what I saw on that hospital train of August 26th. If one wondered at the management that allowed some of the cases to leave a hospital, and to be transported in midsummer upon a crowded, dirty, poorly supplied hospital train hundreds of miles, he could not fail also to admire the courage and appreciate the trials of the surgeon in charge, who succeeded in bringing his men through with so little loss of life.

