Passed April 1882

Thesis for M.D.

Observations on Typhoid or Enteric Fever

by

James B. Mackenzie M.B., C.M..

2/

During my two years residence in Crook, a Colliery district in the county of Durham, I have met with sporadic cases of Typhoid fever, all of which, from close observation made of the symptoms and general appearances at the time, present various salient points of interest.

On the causation and history.

The cases I have had under my charge, have occurred in an endemic, or as I should more correctly say, in a sporadic form.

Various authors mention in their works that it occurs for the most part in an endemic form, but that it sometimes assumes the proportion of an epidemic.

Now the term endemic, as applied to Typhoid fever, seems to me to be somewhat misleading. If it is correct that the diseases, which appear in the latter form, only appear among the people in a restricted area; that they are dependant upon local causes; and that they have a tendency to continue in that particular locality, such as Marsh fever and Goitre; then this term cannot strictly be applied to Typhoid fever, which is not confined to any particular locality, but either breaks out in cases here and there, or in a true epidemic form.

4/

I think that, to prevent confusion, when Typhoid fever occurs in cases irregularly distributed in different areas, and not of sufficient magnitude and prevalence to assume an epidemic, we ought to restrict the term "sporadic" to those cases, leaving the term "endemic" to embrace such cases as appear from time to time in the particular locality where they have their habitat.

Regarding the origin of Typhoid fever, I am not inclined to accept the theory of Dr Murchison, that the specific poison of the disease is produced in defecation of the disease which it produces, or in other words, that it arises de-novo.

The cases which I have had under treatment, would almost justify me, were I willing, in accepting this theory.

In none of them could I possibly trace from what source the poison got access into the system.

The houses, speaking generally, are constructed in the following manner:-
The kitchen with back-scullery are on the ground-floor, and bed-rooms on the top-flat.
The drinking water the quality of which, according to the Public Analyst, is excellent, is laid into those sculleries from the main-pipe.

There is a sink at the back of each house or group of houses, into which is poured the "slops" or waste liquid material.

This passes by the drains into the sewers, which finally empty themselves into a "beck" or running stream passing through the lower part of the town. These sewers are efficiently trapped, but no ventilators are connected with them. In none of the workmens' houses are there any water closets, so that there is no risk of any poisonous gas being emitted in the interior of their dwellings.

In the back-courts are ash-pits and dry-closets, which are only separated from the houses by a few yards. All the filth accumulates here until the pits are full, when it is removed by carts during all hours of the day.

Here I would say, is a fertile source for any specific poison multiplying and propagating itself to an indefinite extent.

The inhabitants receive their milk supply from a class called "cowfeeders", but no case has been known to have occurred in any of those places.

Notwithstanding the extreme difficulty I have experienced in my endeavours to trace

the source from where the poison was obtained in each particular case, I still hold to Dr Budd's theory, viz: that the specific virus, which produces Typhoid fever, resides in the evacuations which pass from the bowels of patients suffering from the disease, and be them alone; that it is a living or gamred particle, possessing powers of self multiplication; and that though innocuous at the time of its escape from the body, when a suitable soil is obtained wherein to develop itself, it increases and becomes virulent in a high degree, imparting its specific properties to any fluid media which may become contaminated with the poison.

In my own experience, I can only assign two possible reasons to account for the origin of the disease: —

(1) that the poison was generated in some of the ash-pits which occupy such a close relation to the houses, not de-novo, but from the evacuations of some patient who had been suffering from Typhoid-fever previously, and that the surrounding media had become impregnated with the poison

There being other medical men in the place, and not being aware of what cases they had under

treatment, and where they were situated, I was therefore unable to trace the causation of the disease to its exact source.

In three of my cases, males, past the period of adolescence, all in one street and within a very few yards of each other, I can establish a close connection. One patient took ill on Sept 14th 1881, a second on Nov 6th, and a third on Dec 6th thus allowing sufficient time in the last two cases for the disease to incubate itself;

(2) that the "beck" was the source from which the poison was received.

One patient contracted the disease on Oct 20th 1881, and another on Nov 15th, both living in close proximity to the stream.

This "beck" when there is no rain, only receives a limited supply of water from a coke-burning establishment in the vicinity for flushing it, so that after a period of drought and during hot weather, the odour which arises from it, is very unpleasant, and can be better imagined than described.

On the diagnosis of the disease.

I have found great difficulty in arriving at an early diagnosis.

In a great many of the cases, I have had to

hold my judgement in suspense for a limited time. The disease progresses in such an insidious form, that it becomes absolutely impossible to give expression to your own private opinion during your first visit.

I have been called to cases, and I believe it will be the experience of every practitioner, where you find a patient suffering from anorexia, thirst, nausea and vomiting, diarrhoea with some tenderness over the bowels, increase in the pulse-rate, hurried respirations, and elevation of temperature. The friends are anxious to be informed if it is going to be a case of fever.

In such cases I can only say, that, though the symptoms are indicative of fever, they may be the result of a cold contracted, or some gastric derangement, and that three or four days will decide the point.

I think that the dictum, as laid down by Trousseau, is very safe to bear in mind, that, "when the temperature is 104° from the first or second day of the attack, it is not Typhoid; and that when by the evening of the fourth day it is not 103°, it is not Typhoid."

The case of a man act 32 years, who lived near to my Surgery, illustrates the difficulty

in making a diagnosis.

On the 24th Jany 1882 he discontinued attending his work, as he felt all out of sorts.

He suffered from malaise, headache, sickness, anorexia, a sensation of shivering with a constant desire to sit over the fire, pains in his back and legs, bowels constipated.

My first impression was, that he had caught cold, or was suffering from some attack of dyspeptic disturbance, and that it would pass off in a few days. No improvement took place in a week. The debility, languor and drowsiness, which pervaded his condition all through, tended to indicate that he was suffering from the prodromal symptoms of Typhoid. His tongue was coated with a white moist fur, and there was a slight elevation of temperature.

I endeavoured to ascertain if he had been anywhere to contract the disease, but I could not trace the slightest "clue", hence I had to reserve my diagnosis.

These symptoms continued for over a fortnight, when on Feby 9th, they appeared in a more aggravated form, and he was compelled to take his bed.

Extreme prostration marked his condition from

this time onward.
The skin was hot and dry, temperature 101°, pulse 10
tongue red at edges and tip with a white dry
fur, intense thirst, complete anorexia, copious
liquid evacuations of an "ochery" colour, with
pain over the bowels.
On the following evening, that is the second
day from his taking to bed, I was able
to establish my diagnosis. On pressing over
the right iliac fossa, gurgling could be
detected, and there was a copious rash of
rosy lenticular spots all over the abdomen, which
I did not expect to see so soon. The pulse
ranged 100 - 120, and the respirations 30-35
per minute. These symptoms, which were
attended with delirium of a muttering kind
all through this period, increased in severity,
and the temperature kept gradually ascending
until it reached 105° on the evening of the
eighth day, when the case terminated in a
fatal issue.
I may here state that acute bronchial
catarrh developed itself soon after he took his
bed, the symptoms of which were a dry hacking
cough, hoarseness, voice reduced to a mere
whisper. The percussion sound was tolerably

clear all over the chest; on auscultation, sonorous, sibilant and mucous râles were heard on both sides. The mucus gradually accumulated in the bronchial tubes; the respirations became shallower and more accelerated, and he, being thoroughly exhausted, was wanting in the necessary expectorative power to get rid of the "phlegm," so that he died practically asphyxiated.

I may cite another case which will illustrate Trousseau's dictum.

On Feby 13th I was called to see a young man aet 20, who presented all the ordinary symptoms of febricula. The temperature was 101°, and his bowels were constipated.

I prescribed a diaphoretic mixture, with an aperient, and ordered him off to bed. In my own mind, I was suspicious that it would prove itself to be a case of Typhoid, but I preferred to wait ere giving a definite opinion. The temperature kept ascending until on the fourth evening it reached 105·5°.

In addition, there was complete anorexia, thirst, diarrhoea with copious liquid evacuations, pain and tenderness over the abdomen, stupor, restlessness, tongue cracked and fissured and coated with a dark-brown fur.

I was now in a position to form my diagnosis, and pronounced it to be a case of Typhoid fever.

Other cases could be mentioned, to shew the caution necessary to preserve, before giving a too-absolute opinion of a case, if a medical man is at all anxious to maintain the "esprit de corps" of his profession. Suffice it to say, that the symptoms of the Disease present such variety in their severity and mildness, and in the time of their appearance, that you are Compelled to assume an expectant attitude, not standing idly by, but treating symptoms as they arise in the absence of any disease to account for them, waiting until you have found sufficient data to enable you to form a correct diagnosis.

<u>On the crisis and convalescence.</u>

A number of writers say that the crisis usually takes place Sometime during the third week, when it is followed by defervescence of the Symptoms, and a period of convalescence of longer or shorter duration

Were I to accept this doctrine implicitly, and give my prognosis accordingly, I should myself have often been seriously at fault.

In Scarlet fever, you can generally say with

an amount of certainty, that the crisis will take place about the 3rd or 4th day; that in Measles it will be on the sixth day; and that in Typhus fever, the disease will be at its height on the fourteenth day; but in Typhoid fever you have no such reliable data to work upon.

Doubtless you may expect the fever to reach its height about the middle of the second week, but as to the day when the patient will get the "turn", which the friends are always so anxious about, it is impossible to say.

In a number of my cases, I have found the crisis to take place on the twenty first day. Some of the worst symptoms I have witnessed in a few of those cases: delirium, coma, subsultus, picking of bed-clothes, tongue fissured and dry as leather, absolute refusal of all kinds of food, pulse quick, soft and easily compressible: then on this particular day, to the great joy of my friends and also myself, the appearance of the "critical discharges" would take place, diarrhoea and perspiration, with the tongue becoming moist, consciousness returning and a desire for food.

I can well recall the case of a boy, aet 12, who, had it not been for the skilful attention of his mother, who acted as his sole nurse, would

have inevitably died from inanition, had she not kept feeding him at repeated intervals, when there was complete refusal of food, thus maintaining the vital energy for the trying hour.

I have attented cases where the crises appeared on different days, ranging from the twelfth to the twentieth. In some of those cases, alarming brain symptoms would set in from the very first: delirium, maniacal in its type, with hallucinations of all descriptions, giving one the impression that he was suffering from Pneumonia.

In other cases, the symptoms would continue of a mild character throughout.

I had one case, that of a man act 35, who appeared to be going on favourably, when on the twelfth day, acute delirium set in. He was tossing about the bed in all directions. When anything was about to be given him, he imagined it was poison, and would spit it out. Sedatives were administered, and the head continually surrounded with a bladder of ice. In a couple of days, the delirium ceased, a crisis took place on the twentieth day, and a favourable convalescence ensued.

Another case I had, that of a young man act 22, who contracted the disease, and took his

bed on Nov^r 6^th^ 1881, where the crisis did not take place till Dec^r 15^th^, thirty nine days from the date he was confined to bed.

The temperature rose to 104° about the end of the second week, but it did not continue at this all through the course of the disease: some evenings it was down to 102° and 103°. It presented the usual phenomena of morning remissions, and evening exacerbations, which I found in all my cases. The delirium was of a mattering kind; somnolence, stupor, restlessness; consciousness never left him. All the other symptoms were well marked throughout.

The element in this case, which justified me in maintaining a favourable prognosis, was his ability to assimilate food. His diet consisted entirely of milk and beef tea, which he rarely refused, and which was always judiciously given him by a skilful nurse.

The convalescence of this patient has been notably prolonged, which is due to the exceptional long continuance of the fever.

During this period, his appetite improved every day, and it was with difficulty, that he could be restrained from having certain articles of diet, which at the time were wholly unsuitable.

It was, however, not till many weeks had elapsed, that he could walk across the floor.
He complained of severe pain over, and want of power of, the adductor muscles of the thighs.
This, I believe, was due to granular degeneration of the muscular fibre, and to the long continued exhaustion of the disease.

So soon as he was able to walk, and get out of doors, he steadily gained flesh, and increased in muscular power.
On March 12th he resumed his employment, thus being a period of over four months, from the first date of his illness.

I have always found, and I dare say every one must reasonably expect it, that the longer a crisis is delayed, the longer is the period of convalescence, and vice-versa.

There is no disease which requires such a long convalescence as Typhoid fever, and when the critical day has approached, the temperature does not suddenly decrease to the normal as in Measles and Typhus, but by a lysis, or a gradual decline of the morning and evening temperature, until it reaches the normal.

Our Treatment.

Hygienic :- Where the houses will allow of it, I recommend the patients to be isolated to separated-rooms, and there attended, if at all possible, by a skilled nurse, who has had the disease before

I consider good nursing of primary importance in the treatment. I believe that many a case is lost, where a proper person is not in immediate attendance on the patient.

When a mother is thoroughly impressed with the gravity of the case, and is determined to do her duty, not allowing her judgement to be blinded by the feelings of kindness, well and good; but when this is not the case, a skilled nurse, in all circumstances which will allow of it, should have full charge of the patient.

Knowing the contagious nature of the disease, and the source from whence the poison is generated, it is highly necessary to see that all the evacuations are properly disinfected with Ferrous Sulphate, Condy's fluid, Carbolic acid or Chloride of lime. I recommend complete disinfection of all the sinks, situate behind the houses, into which the "slops" are poured.

Immediately after the termination of a

case, I order the ash-pits and closets to be completely emptied, properly flushed out and disinfected.

Dietetic:— I have generally, during the fever, confined the diet to milk, with or without lime water, chicken soup, mutton broth or beef tea.

I agree with Dr Graves, who maintains, that, in a fever which lasts fourteen, twenty one or more days, the consideration of diet and nutriment is a matter of importance. If the failing powers of nature, during the long continuance of the fever, are not supported, the digestive system becomes lowered in tone, so that, when the time comes that food should be partaken, the stomach is so weak, that it is with great difficulty, it can digest anything, even of a very light nature, and so a protracted convalescence is the result.

During convalescence, I am careful that a low diet should still be maintained, so as to avoid the risk, as much as possible, of perforation of the bowel, and to allow sufficient time for the cicatrization and consolidation of the typhoid ulcers.

In additions I usually prescribe tonics and stimulants in a judicious form.

Medicinal:— Believing that after a certain amount of poison is absorbed into the system,

the disease will run its natural course, hence I hold that medicines won't curtail the disease in the slightest degree. I customarily give an acid mixture as a mild febrifuge, and treat symptoms as they arise.

Keeping in view the many sources of danger, which may arise during its course, my great aim has been to guard against, and prevent them occurring when possible.

The many complications which may attend or follow the disease, as Diarrhoea, Intestinal haemorrhage, perforation, perforation, pneumonia and bronchitis, I treat on general principles.

Application of Cold:—

I am not an advocate of the treatment by cold baths, which Liebermeister of Germany so enthusiastically upholds. I have seen them used in the London Fever Hospital in Typhoid and Scarlet fevers, during a short attendance there, but my experience was so limited, that I cannot speak of their efficacy.

They certainly reduced the temperature at the time, but after reaction set in, it rose as high as before.

The effect of a cold bath passes off in

about two hours, which necessitates twelve baths in the twenty four hours.

This is a procedure which can only be adopted in an Hospital, where you have all the appliances for the purpose.

I should not think of using them, at the present moment, in general practice.

The difficulties are so great, both as regards the time at your disposal in a hard working practice, and the extreme risk attending the removal of a patient, who is in a thoroughly exhausted condition, from his bed to the bath and back again several times a day, that they can't be applied with any hope of success.

I cannot see that any good is to be derived from a single bath now and again.
If such a plan of treatment is to be adopted, with the object of reducing the temperature in hyperpyrexia, I hold that it must be carried out in a heroic manner.

I have never availed myself of the treatment by the cold douche, or the wet pack, as I am rather doubtful that any good results can accrue from them.

I have used ice largely in the treatment of my cases. In delirium I have found

it to be of great advantage in mitigating the symptoms, by applying it to the head, and giving it to suck, as well as giving iced milk and water to drink.

When there has been much tenderness over the abdomen, I have tried iced flannels, and found great relief from their application.

Red House
Crook Durham
19th March 1882