CLINICAL OBSERVATIONS.

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INFANTILE REMITTENT FEVER, TERMINATING IN HYDROCEPHALUS; DEATH PRECEDED BY CONVULSIONS. POST-MORTEM EXAMINATION: KIDNEYS CONGESTED; UREA, AND URIC ACID IN THE BLOOD.

THE relation which renal toxæmia bears to some of the symptoms, and in particular to the coma and convulsions which so often usher in death in acute Hydrocephalus, is often very intimate, and of much practical importance. I am inclined to think that, by a just appreciation of it, I have often been led to adopt, and persevere in, treatment which has proved successful in the most discouraging circumstances. On the present occasion, however, it is not proposed to detail cases in which recovery took place.

The following is the history to which reference was made at p. 703.

CASE of E. A., aged 18 months. The subject of the following history was, a few days before her decease, as robust, joyous, and beautiful an infant as could delight the eye. From my attendance at her birth, till the seizure with her fatal illness, she was much under my notice when visiting other members of the family; but, except on one occasion, it was never necessary for me to prescribe for her; and, then, the malady was so transient and trifling, as to have left no trace in my memory; and the only record is the formula for three aperient powders, entered in my daily prescription book. It can, therefore, be truly said, that her last was her only illness. Her teeth had, as the mother remarked, been found by her accidentally, and with surprise, as their coming had occasioned no feverish symptoms, whereas the other members of her numerous family had all suffered severely during dentition. The child was always plump, and firm in flesh; and she walked and spoke much better than is usual with infants of her age.

On the 14th and 15th June 1849, she was observed, both by the mother and nurse, to be fretful; and, on the latter day, she was drowsy. These symptoms were ascribed to the constipated state of the bowels; and to remedy that condition, the mother gave a dose of rhubarb and magnesia. It produced three dark-coloured, offensive, fluid stools. After these motions, the infant seemed decidedly better; she took some food with avidity, played for a short time with her brothers and sisters, and then fell asleep. The sleep continued, with hardly even momentary awaking, from 4 P.M. on the 15th, to 9 A.M. on the 16th, when she woke, and though in a languid condition, seemed contented and cheerful. At this time, when lying on her mother's knee, after passing a small quantity of high-coloured urine, and taking some food, she was observed to partially turn up the eyes and clench the fists; and about 11 A.M. the eyes suddenly turned quite upwards, the head and neck became bent rigidly backwards, and the whole frame was slightly convulsed. This seizure, which did not last many minutes, was the first thing which excited alarm, and caused me to be called in. I saw the little patient at 12½ noon. She was then in a deep and tranquil sleep. The face was pale;

the surface rather cold, especially the feet; and the pulse, 120. On being awaked, she became flushed and fretful; when I was examining the abdomen, mouth, etc., and scarifying the gums, she struggled and cried, as an infant of her age might be expected to do when unexpectedly roused; but she showed no signs of stupor, nor of any tendency to convulsions. The abdomen was not distended; the mouth was rather hot, and the gums over the first and second molars, on both sides, were somewhat, though not greatly, swollen; the tongue was rather dry, and very foul. It is important to mention, that the mother ascribed the seizure to exposure, when heated, to a draught of cold air from the river: and the continuance of the illness to the close and sultry weather. The condition of the atmosphere was such as to account for some part of the soporose tendency, as at that time many—healthy, as well as sick—were suffering from lassitude and drowsiness. After giving a guarded prognosis, scarifying the gums freely, so as to make them bleed a good deal, I administered, before leaving the house, two grains of hydrargyrum c. cretâ, with one of the resin of scammony. A sinapism was likewise applied over the loins; and I directed that the lower extremities should be fomented with mustard-water. I returned at 4 P.M. The surface was warmer; in other respects, the general character of the symptoms was the same. There had been neither urinary nor alvine evacuations, and the sleep had been heavy and uninterrupted. An enema, containing one drachm of turpentine, was therefore prescribed. At 9 P.M. I found that great improvement had taken place. The mother assured me, that, after the action of the enema, which produced an abundant evacuation of hardened feces, the infant appeared to be quite herself again; was inclined to play, and took some sweetened milk and water, with eagerness and satisfaction. A small quantity of urine had been passed unconsciously before the enema was given; and I was thus disappointed in obtaining any for examination, which is to be regretted, as, in this early congestive stage, it would have been interesting to test it for albumen. I procured, however, the napkin, which exhibited a brownish stain, the margin of the stain being most deeply tinged. Litmus paper applied to the damp napkin was reddened. The quantity of urine voided on the napkin was small. When the enema operated, an additional quantity was passed; but, from being mingled with the feculent discharge, it could not be examined. The pulse was not more rapid, but it was much stronger, the skin was warmer, and there was a very slight flush in the countenance. The following is a summary of the directions which I gave for managing the case, till my return in the morning. If the head became hot, an evaporating lotion was to be assiduously used; the lower extremities were to be kept wrapt up in blankets wrung out of hot water; and the general covering was to be light,—a single sheet, so long as the surface was warm; every four hours, a small dose (six drops) of the spiritus ætheris nitrici was to be given; and early in the morning, a powder of the same composition as that which was administered at the first visit.

17 June, 10 A.M. After I left last night, the infant got rapidly into a state of burning fever, which, after continuing for an hour, subsided, a slight and transient moisture appearing at the same time on the head, face, and chest. A small, offensive, and tar-like motion was passed at

9 A.M., the powder having been taken at 6 o'clock. Excepting a small quantity of urine passed at the same time with the motion, none had been passed since the operation of the enema. An aperient powder was given. In the evening I learned that a good deal of urine had been passed unconsciously, and likewise two offensive stools. I was told that about eight the surface became cold, and some slight convulsive movements were observed during sleep, after which a burning fever set in; and out of this state she was passing when I made my visit (10 P.M.) She was now sleeping softly, and perspiring profusely, with the breathing natural, and the pulse 98. The mother reported that there had been less stupor, and that she followed with her eyes all that was done in the room.

18 June. During this day, a good deal of urine passed unconsciously; the child slept, with only slight interruptions, all day; the skin was moist, the breathing easy, and the expression of countenance natural. A small quantity of urine was obtained for examination; it was high-coloured and acid. When heated, the supernatant portion became clearer after depositing a white precipitate; on adding nitric acid, and continuing the heat, the greater part, but not all, of this precipitate was dissolved. The quantity was too small to enable me to determine the specific gravity.

19 June. If there be any change to-day, it is for the better. The treatment was continued.

20 June, 10 A.M. A change, decidedly for the worse, came on during the night, and for the last twelve hours there has been profound coma, and neither alvine nor renal evacuation. The muscles of the face have been a good deal convulsed on several occasions, the fists clenched, the eyes open and upturned, and once there has been an attack of opisthotonos, as before my first visit. I immediately ordered a turpentine enema, similar to that formerly given; and the enema was administered, and the gums were again scarified.

21st. From 9 to 11 this morning there seemed to be some slight improvement in the countenance; but there had been hardly any, if any, urine passed. In the afternoon the stupor became very profound; a blister was applied to the head, sinapisms to the loins, a purgative enema administered, and a mixture, containing gamboge, given at intervals. The blister discharged freely; and there was one abundant liquid stool from the gamboge. Again the result of the treatment seemed to be hopeful.

22nd. There has been some improvement to-day, and the child has on several occasions recognized her mother, and brothers and sisters; but there was no diminution of the comatose state on the three occasions on which I visited her. Dr. Sibson saw the child at 9 P.M., along with me, when the condition was certainly very different from what had hitherto existed; this, perhaps, might be owing to the circumstance of the infant having taken too much of strong beef-tea during the hours when she had partial consciousness. The countenance was flushed, the head burning hot, and the pulse full, hard, and rapid. These symptoms were speedily abated by leeches to the temples, and the application of ice, for some hours, to the head.

23rd. The state to-day has been very similar to that of yesterday,

including the vascular excitement in the evening. The fever was not, however, of so long duration, and passed off in perspiration,—the consequence, apparently, of hot fomentations to the limbs, and the application of cold to the head. After the perspiration, the child seemed very weak, and two doses (of ten drops each) of brandy were administered.

24th. There has been much more prostration to-day, and a persistency of coma. There has been no water passed, excepting towards the afternoon, when a little was seen to flow, perhaps about three or four drachms, which left a stain upon the towel like that of bloody serum. A scanty stool was passed during the night. In the afternoon, about the same hour as on the preceding days, vascular excitement set in strongly. When I saw the child about 10 P.M., the pupils were contracted, the veins in the neck and head turgid, and, every ten minutes, there occurred opisthotonic convulsions, the fists being firmly clenched at the same time. The clenching of the fists was the first indication of the coming opisthotonos. Sometimes the face was distorted, but not always. At midnight I returned, and found matters had been going on from bad to worse; the convulsions were much stronger, almost without intermission, and accompanied by incessant and piercing shrieks. When I left between 12 and 1, I did not suppose that life could have lingered till 5 next morning,—the hour at which the infant expired. The convulsions and the shrieks continued up to the moment of death; and the mother assured me, that, upon some occasions, the violence of the spasms was such, as to bring the head and heels almost into contact.

When I saw the body early in the morning, some hours after death, the surface was purple, and the features much distorted.

SECTIO CADAVERIS, made twenty-six hours after death, on the 25th June, 1849, half-past 6 to 8 A.M., by me and Dr. Alexander Henry.

External Appearance. The anasarca appearance was evident, though much less marked than during life. Notwithstanding the heat of the weather during the previous day and night, there was no trace of decomposition having commenced. There was slight cadaveric rigidity.

Head. The head was well formed. On removing the scalp, a small portion of the anterior fontanelle was observed to be unossified, and through the membrane in that situation, as well as through the bones themselves, could be seen the great vascular congestion existing below them. In dividing the skull, the bone bled freely; and on removing the upper segment, the dura mater presented a rigid appearance, from the prominence of the distended blood-vessels. The brain, being very soft, was cautiously sliced from above downwards to the roof of the lateral ventricles. The congestion between the hemispheres was very great, and the blood in the vessels of the substance of the brain was unusually abundant and fluid. The right ventricle was enormously distended with clear serous fluid; three and a half drachms were removed and measured, but an additional quantity was lost, from the softness of the brain causing a laceration by which it escaped. The left ventricle also contained an abnormal amount of fluid. The choroid plexus on each side was much gorged. The fourth and fifth ventricles were distended with fluid. The cerebellum was firmer than the cerebrum; and the pons varolii and medulla oblongata were much firmer

than the cerebellum. The vessels of these parts were congested. The amount of subarachnoid effusion was inconsiderable, as compared with that in the ventricles. No clot or extravasation of blood was seen, though carefully looked for. The fluid removed from the ventricle was examined by Dr. A. B. Garrod; he found it to have a specific gravity of 1007.5, and a slightly alkaline reaction.

Chest. There was no effusion into the cavities of the pleuræ or pericardium. The viscera of the chest were natural in position and structure. The blood in the heart and vena cava was fluid.

Abdomen. There was no effusion into the peritoneal cavity. The intestines were moderately distended with flatus. The liver was not congested; the gall-bladder contained a moderate quantity of black, thick bile. The spleen was, perhaps, a little more bulky than natural, but it was not softer than usual. Both kidneys were much enlarged; the left was the largest. When cut into, the blood trickled from them: they had a soft feel, and were so pulpy, that, in the hot state of the weather, and with other urgent duties to attend to, it was not possible to reserve them for microscopical examination. Their condition, however, was that of enormous hyperæmia, with, no doubt, ruptured Malpighian tufts. There was no urine in the bladder.

The Blood. Dr. A. B. Garrod very kindly made a careful chemical examination of fluid blood, chiefly removed from the heart, vena cava, and pulmonary artery, with a little also from the sinuses of the dura mater. The whole quantity examined was so small, that he could only procure from it 185 grains of solid matter. He says: "urea was found in it, in greater abundance than in healthy blood. It also contained a larger quantity of uric acid than healthy blood."

REMARKS. The case which has now been detailed is interesting from the apparent absence, in its first stage, of inflammatory symptoms, from the well-marked remittent character maintained throughout by the disease, from the albuminous condition of the urine (as in intermittent fever), and from the superabundance of urea and uric acid found in the blood, by a gentleman whose accuracy in, and familiarity with, such researches, are well known.

Is acute Hydrocephalus always an inflammatory affection? I confess that my own experience has long inclined me to this opinion; and, that the treatment, which this view of the pathology of the disease suggests, is safe in the majority of cases, there can be no question. Leeching, general blood-letting, and active purging, are all most obviously efficient for good in a large number of cases. Still, in the case now narrated, there did not seem to be any propriety in regarding the disease as inflammatory; and, perhaps, in numerous instances in which blood-letting proves useful, the principle of its beneficial operation is the relief which it affords to congestion, just as it proves useful in certain forms and stages of remittent and intermittent fever. The recognition of this principle, if correct, would often be of great service in preventing mere empirical depletion, in regulating the amount of blood which ought to be taken, and in pointing out the exact periods at which it ought to be drawn. In place, then, of answering the question proposed, by an un-

qualified affirmative, it would apparently be more correct in theory, and more useful in practice, to hold that acute Hydrocephalus, *i.e.*, effusion into the arachnoid sac and ventricles, following in a few days, or it may be in a few hours, the first recognisable deviation from health, is a form of dropsy, which may supervene upon the congestive stage of a remittent or intermittent fever, with or without an intermediate inflammatory stage. The irritation of teething, also, intestinal worms, and various diseases of the abdominal viscera, occasion, in many children, severe and alarming head symptoms, depending on cerebral congestion, very prone to terminate in effusion. In each case, the special disorder must be the key to the treatment; and however imperative active measures may be, to avert or remove cerebral mischief, it would be mere empiricism, were we to treat every case as if the head were the primary or principal seat of the disorder. For example, it would often be good practice to combine the disulphate of quinine with calomel, or other medicine which we may exhibit to act on the chylipoietic viscera.

Early change of air might have been of material benefit in the case detailed. In two cases, almost identical in their symptoms, and exactly coincident as to local and atmospheric circumstances, I have, within the last few weeks, had the happiness to witness recovery; and in both, the treatment embraced the steady exhibition of quinine; and, in one instance, along with this, the patient had the benefit of change of air.

It may be well to remark, that for some months past, the majority of cases of all diseases in this neighbourhood have, so far as my experience goes, presented a well-marked tendency to assume the remittent and intermittent types. This has been particularly obvious in the serous diarrhoea, or cholerine, so prevalent and so fatal, as well as in such fully-developed cases of true cholera, as did not terminate too speedily to prevent the whole group of symptoms from being manifested. Being anxious to ascertain whether this interesting character had been recognized by others, I applied to Mr. Whiteman, my neighbour, who, as medical attendant on the poor of this parish, has had, in addition to his private practice, a large experience in cholerine and cholera, within the last few months; and he entirely corroborates what I have stated, as to these affections presenting an unmistakeable relation in the character and sequence of their phenomena to intermittent fever. It will be interesting to learn, whether the same thing has been observed generally throughout the country, or whether it has been more manifest in particular localities. It has certainly been equally obvious in some cases which I have had on the other side of the river, in Fulham.

Essex House, Putney, September 1849.