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PART I.

ORIGINAL COMMUNICATIONS.

ART. V.—*Diphtheria. Analysis of One Hundred Cases.*

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DURING the year 1898-9 we admitted into Cork-street Hospital one hundred cases of diphtheria, amongst whom the death-rate was 18 per cent. This is the largest number of admissions and the lowest death-rate recorded in any year. Of these cases we find 63 were females and 37 males.

The greater proportion of cases of diphtheria are under ten years of age, sixty-six per cent. of the cases being under that age, and for that reason we will lay most stress on the diagnosis in young persons.

We may lay down as a rule, first, that nearly all cases of diphtheria, excluding wound diphtheria, are primarily tonsillitic, and by extension invade the larynx and nasal tract.

In diagnosing diphtheria in children, four kinds of sore throat must be kept in mind, viz.:—Scarlatinal, rheumatic, diphtheritic, and septic, due to pus in the oral cavity, as aphthæ, &c.

The term membranous sore throat is now used only as a loop-hole of escape for the over-cautious.

Scarlatina without a rash is not a disease of childhood. If the throat symptoms be severe the rash is present in propor-

tion, and well-marked, or there will be the diagnostic browning at the flexures and red spots on the extremities, and characteristic tongue. When the two diseases co-exist the diphtheria nearly always takes on a nasal type in addition to the formation of membrane on the tonsils. Also one generally notices that in scarlatina the child looks heavier and collapses much earlier than in diphtheria. One must always bear in mind that the two diseases may co-exist, and when the throat symptoms are suspicious make a bacteriological examination.

Rheumatic sore throat is nearly always accompanied by pains in the muscles of the neck or vague pains in the body, sweating skin, redness of palate, pharynx and tonsils, deep injection in spots, and often a rheumatic history and a rheumatic purpura.

There is, I believe, greater difficulty in diagnosing pyæmic throat from diphtheria, as it often presents very similar appearances; swabbing is the only true guide.

In the sore throat which arises from constipation the appearances are different. They are more like those of follicular tonsillitis—one has not the enlarged glands, but a foul, coated tongue, soft sweating skin, and fæcal breath; and the patient is far more oppressed than is usual in diphtheria in the early stage.

The diagnosis of diphtheria is made by the presence of membrane, enlarged glands under the angle of the jaw, temperature most frequently raised, but sometimes sub-normal or normal; a peculiar and very characteristic fœtor often present, frequently with well-defined patches of greyish or whitish hue on the tonsils, and often in the soft palate; these may be so large as to simulate a mushroom and completely hide the back of the throat. These patches are more or less adherent, will not come away with a cotton wool swab, or if removed leave a bleeding surface; or the membrane will be a soft pultaceous looking matter, darker in colour and more offensive. Sometimes one may see round holes dug out with jagged, sloughing edges, easily distinguished from the empty abscess cavity, or an irregular ulcerated surface with greyish purulent matter adhering; sometimes one can see only congealed blood and sloughing throat with intense fœtor. This is a very fatal form; therefore, one

may conclude that, when a child suffers from a sore throat with membrane which will not wipe off easily, or ragged ulceration with fœtor, enlarged glands, especially if accompanied by nasal discharge, and husky voice, one should bear diphtheria in mind, and, failing to put it under any other heading, treat it as diphtheria, and inject at once and swab (before applying anything else to the throat), so as to confirm the diagnosis. Injections do not cost much, are not painful, do not require the services of a surgeon, and may in an emergency be administered with an ordinary hypodermic needle, and so far as our present knowledge goes, are free from any injurious effects even when the case proves not to be diphtheria.

If the patient has been in contact with infected persons, the throat may be simply red, though not much swollen, and no membrane visible. This absence of membrane has not been noticed in children (cases with a large quantity of membrane often do very well, and the converse also holds). One cannot base a prognosis on the quantity of membrane, but finds where the membrane is well defined and raised the cases do well, also when the temperature is over 101° on the second or third day the prognosis is mostly favourable. What strikes one most about the disease is its insidious nature, and the frequency with which it is present in the throat without the patient making any complaint.

As is seen in scarlatina often when the throat is much engaged the patient swallows well, the membrane or secretion acting like a glove and deadening sensation.

The first symptoms of diphtheria in a child are generally vomiting, headache, lassitude, and sometimes pains in the bones. On examination one notices the enlarged glands under the angle of the jaw, the tired facial expression, and a peculiar fœtor from the breath, which is diagnostic, as is the fœtor of typhus. The tongue as a rule is very dirty. There is more or less membrane on the tonsils, palate and pharynx, which presents the various appearances described above.

Prognosis—The earlier a case comes under treatment the better the prognosis. When we analyse the 100 cases we find 48 entered as having been only one or two days ill. Of these six died—death-rate 12·50. Four died of laryngeal

symptoms within ten hours of admission, two had nasal discharge and died on the fourteenth day. I think we are correct in assuming that these cases were longer ill than stated—*i.e.*, that the membrane had been present on the throat for several days before the larynx and nostrils became engaged. Nineteen were three days ill. Of these five died, showing a death-rate of 26 per cent. Four died on the seventh, and one on the fourteenth day. Twelve were suffering from scarlatina, of whom four died, showing a death-rate of 33·3 per cent.

The cases under treatment varied greatly in severity at different periods. Sometimes there would be a run of severe cases, and sometimes of slight, so that prognosis could, to a certain extent, be based on the prevailing type.

We can classify diphtheria into tonsillitic, nasal, and laryngeal. There were 67 of the first class with two deaths, 27 nasal with ten deaths, and 16 with laryngeal symptoms, with six deaths.

One may lay down the axiom that the earlier the nasal discharge appears and the more foetid it is, the worse the prognosis; one also finds that in scarlatina the nasal type is most common at the early stage, and the laryngeal type in the convalescent stage.

The insidious nature of the disease is one of its most dangerous characteristics—for instance, a woman brought in an infant early one morning which had died on the way to hospital, and the history she gave was that it “got bad with its breathing in the middle of the night.” Examination showed that it was a case of diphtheria probably of several days’ duration, and on questioning her about the other children she stated that they were quite well, and going to school, but we found on examination that the mother and two children were suffering from diphtheria, the children eventually recovering after a very severe attack.

I have seen a child playing about the garden, and, on examination, found his throat covered with membrane.

The period of dying is distinctive. Most of the cases die on the 7th, 14th, or 21st day of illness. Some die quickly of the intensity of the poison, with all the symptoms of intense blood destruction, evidenced by hæmorrhagic purpura, diarrhœa, vomiting, collapse, with putrid nasal discharge;

some of laryngeal obstruction and pneumonia; some of cardiac failure; and lastly, of prolonged fever, diarrhœa, and exhaustion. One may see grave cardiac paralysis come on about ten days after very slight throat symptoms.

The treatment we have found most successful is, the injection of 750 to 1,000 units of antitoxin into the thigh or behind the shoulder with simple antiseptic precautions (when we injected into the abdominal walls we found that diarrhœa ensued in several cases). This may be repeated next day, but we have not found it of much avail in severe cases where the nasal trouble has been long present. Much larger doses are sometimes given, but I think it is of greater importance to get a reliable antitoxin, and give calomel, grains 1 or 2 every hour or two hours until the bowels be well moved. This seems to me to be of particular benefit in laryngeal cases. Dry the throat with cotton wool, and apply Loeffler's solution to the parts, holding the swab for a minute, if possible against the membrane; spray the throat frequently with paroleine in which 10 grains each of salol and menthol have been dissolved. If there be much tonsillitic swelling we sometimes apply poultices to the neck, bringing them up above the ears, we use internally a mixture of liq. ferri hydrochlori. and quinine, in doses suitable to the age of the patient. For the nasal discharge we use warm solution of carbolic acid, one in 40, with bread soda, 60 grains to the 6 ounces as a douche. With older patients if they complain of pain in swallowing, a Nelson's inhaler with carbolic acid solution is used. We seldom order stimulants in the early stages, as alcohol vitiates the action of antitoxin, and there is no need as a rule. No case developed laryngeal symptoms after admission, and only one died of cardiac failure, a girl aged 7 years, on the fourteenth day of a severe attack with nasal discharge.

We have nothing special to report in reference to the kidneys, as none of the cases developed nephritis.

Eight convalescents had paralytic symptoms which called for special treatment, several others showed slight transient paralysis of the palate or eye muscles.

The length of time the throat may remain infectious after an attack is very variable. We never discharge a patient until all redness has disappeared, and when after rest for

twenty-four hours from all treatment, the swab gives a negative culture. We have found in one case the bacilli present a month after all membrane had disappeared, and in another which had slight redness of the throat five weeks later. Of course we do not consider a case safe till the mucous membrane of the nostrils is normal: in two cases the membrane reappeared; in one on the 19th and in the other on the 14th day after injection of 750 units.

In the Metropolitan Asylum Board's Report, we find that diphtheria is most prevalent in the winter months. With us most of the cases were admitted in July and August, and September and October. We also find that their death-rate is 20·9 per cent. with serum treatment, which accords with ours of 18 per cent.

On looking back over the cases there is not one in which we regret having withheld operative interference, as those cases classified as laryngeal which died, did not die as a rule of dyspnoea, and all its accompanying distress, but of diarrhoea and pneumonia, and in some cases so soon after admission that interference was not possible.

As regards operation, the ideal cases would be where the laryngeal symptoms supervene after the child has come under treatment. In such cases the rule to follow is, so long as the patient sleeps it is best to wait, but if the patient becomes restless, or is becoming comatose, operate at once. I believe in several cases the laryngeal symptoms were due not to membrane but to swelling of the vocal cords, with a certain amount of spasm, which generally passes off without operation.

Unfortunately our statistics of operation cases show bad results. Of the two cases in which we operated immediately after admission, one died in the night suddenly from obstruction of the tube, and the other slowly from extension of the membrane down to and below the bifurcation of the trachea. In such cases one can only promise to give relief and produce a condition of euthanasia, but naturally the prognosis is very grave.

Since writing the above we have had a successful case after tracheotomy, which was done eighteen hours after the patient's admission, a child aged two years. In this case the patient was becoming rapidly comatose.