

## OUR PRIZE COMPETITION.

DESCRIBE THE CLINICAL FEATURES OF A CASE OF DIPHTHERIA. HOW WOULD YOU EXPECT SUCH A CASE TO BE TREATED ?

We have pleasure in awarding the prize this month, to Miss M. W. Hooper, S.R.N., Horton Emergency Hospital, Epsom, Surrey.

### PRIZE PAPER.

Diphtheria is an acute infectious disease, caused by the *Corynebacterium Diphtheriæ* or Klebs Loeffler Bacillus, and characterised by the formation of a false membrane and production of toxin. This toxin affects the heart muscle, endothelium of blood-vessels and certain nerves.

The disease is classified according to the site attacked ; the most common types are faucial, naso-pharyngeal, anterior nasal and laryngeal. Rarely the conjunctiva, the ear, umbilicus or vulva are involved, and the bacillus may infect wounds. Diphtheria is spread mainly by droplet infection as a result of direct contact with a patient or with a healthy carrier. All ages are susceptible, but it is most prevalent in the pre-school child of two to five years.

The onset of faucial diphtheria is classically insidious. Early symptoms are general malaise, fretfulness, aches and pains, loss of appetite and perhaps vomiting, but these may not be very obvious. Young children seldom complain of sore throat, although older children and adults may do so. The disease is thus likely to remain unsuspected during the first three or four days and valuable time may be lost in instituting specific treatment.

The throat is at first injected, then a thin film of exudate appears on one or both tonsils, becoming thick and yellowish or greyish-white in colour, resembling a piece of washleather. The membrane tends to spread to the surrounding structures ; the rate and extent of spread will depend on the virulence of the attack. It is firmly adherent, and if forcibly removed leaves a bleeding surface and quickly reforms. In severe cases the membrane is extensive and dark in colour ; the fauces are œdematous ; there is a characteristic foetor, profuse purulent nasal discharge and considerable swelling of the lymphatic glands and periglandular tissue in the neck producing the "proconsular" or "bull" neck. The temperature is moderately raised—100 to 101 degrees—but gives no indication of the severity of the attack. The pulse is soft and rapid.

In the mild case the membrane disintegrates in a day or two after administration of antitoxin and other symptoms improve, but prognosis must still be guarded, as complications may develop. A severe case shows less response to antitoxin, the membrane separates more slowly, the patient remains pale and apathetic and complications are to be feared. The most fatal complication is heart failure ; this may develop at any stage of the disease but most frequently occurs about the eighth day. It is preceded by vomiting, restlessness, and alteration in the pulse, which becomes feeble, irregular, and abnormally slow or rapid. Other characteristic complications are paralysis of certain muscles, due to an affinity of the diphtheria toxin for the nerves which

control them. Paralysis of the soft palate, which is the commonest, occurs in the third week ; paralysis of the eye muscles in the fourth week ; and paralysis of pharynx, diaphragm and intercostal muscles in the fifth to seventh weeks. Other muscles less commonly involved are those of the face and lower limbs, and the sphincters. Albuminuria, cervical adenitis, otitis media and broncho-pneumonia may also occur as complications.

Naso-pharyngeal diphtheria is always associated with extensive membrane and resembles a severe faucial attack. In contrast, the anterior nasal type is generally the mildest form ; it is characterised by persistent nasal discharge and membrane may be seen in the nostrils. Complications rarely occur, but infection is often persistent and the patient may become a carrier after recovery.

Laryngeal diphtheria may be primary or accompany one of the other types. The symptoms are hoarseness, followed by loss of voice, a croupy cough, stridulous breathing, and inspiratory recession of the soft tissues of the chest wall. These may become more marked, the pulse become increased in rate and irregular, and the child very restless. If the obstruction is not relieved at this stage, exhaustion, coma and death will follow. If recovery takes place paralytic rarely develop in purely laryngeal cases.

In the treatment of diphtheria antitoxin is given as early as possible. The dose will vary from 16,000 to 100,000 units, according to the severity of the attack. In mild cases it is given by intramuscular injection ; in severe cases, part of the dose is administered by the intravenous route, and may be followed by saline with glucose. Absolute rest in the recumbent position must be enforced for at least two to three weeks ; in severe cases, for six to eight weeks or longer. Warmth is important, and the foot of the bed is elevated if necessary. No local treatment to the throat is given, but the mouth needs to be kept clean, and the nurse must obtain the child's confidence so that this and other treatment can be carried out without upsetting him. The bowels are regulated by enemas ; aperients are not given until there is no further risk of heart failure. Routine examination of urine is carried out and the amount passed is noted. Diet will consist of fluids at first ; light diet is given when the throat is clean, but discretion is needed because of the risk of causing vomiting. Glucose is valuable as there is always some degree of acidosis. If palate paralysis develops, careful feeding with thickened fluids will be required, and nasal feeding if the pharynx is paralysed. The condition of the pulse must be observed frequently, and any indication of heart failure or other complications reported at once. In cases of respiratory paralysis, a drinker or other form of mechanical respirator may be used.

Laryngeal diphtheria is treated by antitoxin, rest, and inhalations of steam. If obstruction increases, tracheotomy or intubation will be performed or the membrane may be removed by suction through a laryngoscope.

If progress is favourable a slow return is made to the sitting position ; then the patient is gradually allowed to get up. At least two consecutive negative cultures from both nose and throat must be obtained before his discharge from hospital.

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