

DIPHTHERIA AND ITS SEQUELÆ IN THE NORTH WEST OF INDIA.

BY MAJOR S. SMITH,
Royal Army Medical Corps.

THERE has been a disquieting prevalence of diphtheria, and more especially of post-diphtheritic polyneuritis, during the past year, amongst the European population, throughout the whole of the North West Frontier region of India.

The incidence of diphtheria, and more especially of polyneuritis, has been greatest amongst officers and their families, notably at certain frontier stations, where many cases of severe post-diphtheritic paralysis have occurred.

On the other hand, whilst diphtheria has been relatively common amongst the "Other Ranks," paralysis has been but seldom met with.

I believe this comparative immunity from post-diphtheritic sequelæ in the case of the non-commissioned ranks to be entirely due to the fact that every case of sore throat of any severity is admitted to hospital, three or more swabs are taken on successive days as an *absolute* routine, any cases in the slightest degree clinically suspicious, or which do not react to routine treatment in a very few days, receive an adequate quantity of anti-diphtheritic serum, no matter what the laboratory findings may be.

On the other hand, in the case of officers, and more especially of their families, the examination of the throat is apt to be more perfunctory, there are difficulties in taking an adequate number of throat swabs, many do not report with sore throat, and, in some of the smaller stations, where laboratory facilities are not so good, the media may not be above suspicion.

Whilst some of the cases under review were known to have had diphtheria, K.L.B. having been isolated from their throats and serum injected, others had suffered from sore throat with apparently no clinical resemblance to diphtheria, and throat swabs had proved consistently negative. One case, that of a B.O.R., denied any history of sore throat or even of nasal discharge, yet he developed paralysis typical of the post-diphtheritic variety, and he belonged to a unit in which diphtheria was prevalent at the time.

I can best explain my theme and point out some of the difficulties in diagnosis by a few illustrative cases:—

Case 1.—Pte. D. was admitted to hospital from the Rawalpindi garrison on February 12, 1929, with a history of a "dead feeling" in his feet, of five days' duration, and of inability to keep up with his unit on the march. He had not recently suffered from a sore throat or nasal discharge, but there were several cases of diphtheria from his unit in hospital at the time.

Clinically, he presented a typical picture of mild post-diphtheritic polyneuritis with characteristic stocking and glove anæsthesia. Numerous throat swabs were negative. He made a complete recovery, leaving hospital two months after admission.

(A similar case occurred in Secunderabad some years ago, and was duly reported at the time [1]: in this case, also, the man gave no antecedent history of sore throat, but admitted to a bad cold two months previously. Diphtheria was prevalent in his unit at the time.)

Case 2.—L/C. S., also of the Rawalpindi garrison, was admitted to hospital on February 25, 1930, and gave a history of bad sore throat a month previously. He examined his own throat at the time with a mirror and noted white patches on both tonsils; he did not report sick with the throat but obtained gargles from the M.I. room orderly. Fourteen days after the onset of sore throat he noticed that fluids tended to regurgitate through his nose, and he suffered from temporary blurring of vision, these two symptoms lasting only a few days; his hands and feet became numb a week later, and he noticed weakness in his legs and unsteadiness in walking about the same time.

He was very white, run down, and shaky on admission, and recovery has been slow in his case; even now, three months later, there is considerable paresis, especially of the dorsiflexors of the wrists and ankles.

The above are the only two cases of post-diphtheritic paralysis that have occurred in the Rawalpindi garrison during the period under review, although many cases of diphtheria occurred and received serum treatment.

No case of sore throat or diphtheria admitted into the British Military Hospital, Rawalpindi, during the same period has so far developed post-diphtheritic sequelæ. A special case book is kept for all admissions for sore throat, wherein are entered full details as to clinical signs, presence or absence of membrane, treatment adopted, clinical course, etc., etc.

Throat swabs are taken on three successive days as an absolute routine, and, as stated above, serum in adequate amount is given immediately on admission in all suspicious cases, irrespective of laboratory findings, and also to all cases, even if not clinically suggestive of diphtheria, which do not clear up in a very few days on symptomatic treatment. This is, I believe, an absolutely necessary routine, and should *never* be omitted.

Case 3.—Lieutenant K., R.A.M.C., was transferred to Murree from a "Plains Station" on May 10, 1929, and gave a history of having suffered from mild sore throat, slight pyrexia, general malaise and fainting attacks, for a fortnight before admission, during which period two or three throat swabs had been taken with negative findings.

On transfer the patient was noted to be very pale and "washed out," his throat was red and congested, with much glairy muco-pus adherent to the posterior pharyngeal wall, and, a most important and suggestive sign, his left lymphatic tonsillar gland was swollen and painful with a small chain of shotty glands leading down from it to the region of the left clavicle.

From a swab taken from the posterior pharyngeal wall K.L.B. were obtained in pure culture.

Serum was administered, and he made a slow recovery.

Six weeks after admission, on his first being allowed up, he had a typical and alarming attack of paroxysmal tachycardia, with a pulse-rate averaging 200 or more, which lasted for more than two hours. The attack commenced and ceased with absolute suddenness, and was distressing while it lasted, but once the attack was over he felt perfectly well again. He had several similar attacks during convalescence and noted that they were specially liable to occur if he put anything tight round his neck like a collar; it was, in fact, while putting on his collar for the first time after a prolonged period in bed that the first attack commenced. He made a complete recovery and was able to play Rugby football during the following winter.

It is interesting to note that this patient had an electrocardiogram taken of his heart some years before as a medical student and was told that he had marked sinus arrhythmia.

It is just this type of case that one is apt to "miss." His throat was never really acutely sore, nor, I believe, was there any membrane to be seen at any time.

Prolonged sore throat, not amenable to symptomatic treatment, slight irregular pyrexia, malaise and general ill-health, combined with glandular enlargement and a history of fainting attacks, should have given the clue to a correct diagnosis in his case.

One must never forget that membrane is by no means a *sine qua non* in the diagnosis, even, of faucial diphtheria; and it is these insidious cases with, one supposes, just sufficient local resistance to prevent the formation of macroscopic membrane, who are most liable to develop post-diphtheritic sequelæ, for the simple reason that they have not received serum in the early stages.

Case 4.—F/O. S. was transferred from a Frontier Station on January 19, 1930, as a severe case of post-diphtheritic polyneuritis.

He had suffered from a severe attack of clinical follicular tonsillitis during October 1929; a whitish membrane was noted on his left tonsil which persisted for a few days, but, as throat swabs taken at twelve-hour intervals were negative as regards K.L.B., he received no serum.

A persistently high temperature which accompanied and followed his sore throat was held to be due to malaria, and he received a series of intramuscular injections of quinine.

Whilst on convalescent leave a month later, he suffered from weakness of the legs, diplopia, blurring of vision, and regurgitation of fluids.

On transfer to Rawalpindi he was found to be suffering from severe multiple neuritis, obviously post-diphtheritic in origin; there was severe paresis, almost amounting to paralysis, of all four limbs combined with characteristic sensory loss of the stocking and glove variety.

He made a rapid recovery, and was invalided to the U.K. two months later with almost complete use of both legs.

Case 5.—Major B. was treated in quarters during November and December 1929, suffering from post-diphtheritic paralysis; he gave the following history. He reported with a sore throat early in September and made a rapid clinical recovery on symptomatic treatment with gargles, etc. A few days later he developed a severe follicular tonsillitis and a septic "spot" appeared on his uvula; frequent swabs proved negative to K.L.B. and he returned to duty apparently cured.

Early in November he noticed that he appeared to have lost control of his feet, and they were weak from the knees down; this was followed by weakness in the hands and fingers accompanied by a sensation of "pins and needles." He further stated that early in October he noticed that fluids regurgitated back through his nose, but this he regarded as trivial and did not report sick.

Clinically there was a definite peripheral neuritis of the arms and legs.

The two cases are of interest in that, although frequent swabs were taken and proved negative to K.L.B., both patients must have actually suffered from diphtheria, and in one case membrane was actually present for some days.

It is easy to be "wise after the event," but in my opinion both these cases should have been looked on as suspicious and should have received early serum treatment, irrespective of laboratory findings.

Case 6.—Boy G., aged 12, was admitted to hospital on June 4, 1929, with a history of having been treated as an out-patient from May 23 to 30, for "acute catarrhal tonsillitis," *during which time no swabs were taken.*

On admission he looked ill and "washed out," there was considerable peritonsillar swelling surrounding the left tonsil, and a small piece of membrane could be seen lying at the base of his left tonsil; the left tonsillar gland was swollen, and he had an offensive nasal discharge.

K.L.B. were not seen in the direct smear, being crowded out by a wealth of secondary organisms, but were obtained in pure culture on selective media. The child made a rapid recovery after serum treatment.

This case of course speaks for itself, and negligence was shown in not taking swabs earlier, but it is only one more example of the care we must exercise in swabbing all suspicious throats and nasal discharges, especially in children.

I have cited these cases in no carping spirit, but simply to show how easily mistakes arise, and how valuable time may be lost in the early stages of diphtheria, when serum treatment produces such magical results.

If every case of sore throat, however mild, be regarded as potential diphtheria, at least in districts and during the seasons in which this disease is prevalent, we shall see fewer cases of post-diphtheritic paralysis than is now, unfortunately, the case.

The presence or absence of K.L.B. in a throat swab is only one of the

factors that should sway our judgment for or against diphtheria; other signs of almost equal importance being membrane on the tonsils, especially if involving the uvula, enlarged and painful tonsillar or cervical glands with sore throat, continued sore throat that persists in spite of treatment, a low continued pyrexia (although diphtheria with high temperature is common in this country), a white face and small rapid pulse, albumin in the urine, etc.

It is only by careful appraisalment of all these factors that one can decide for or against diphtheria in any given case.

There is, in this connection, a golden rule: If in doubt give serum, give enough, and give it early.

Some years ago I wrote with considerable trepidation an article calling attention to the prevalence of anomalous cases of diphtheria in the neighbourhood of Secunderabad [1], and insisted on the necessity of early serum treatment in all suspicious cases if we are to escape disaster.

Further experience in another widely separated part of India has only confirmed me in this view and taught me how one must be constantly on the look out for diphtheria in its many disguises if one is to escape its immediate disasters and dangerous sequelæ.

SUMMARY AND CONCLUSIONS.

(1) The incidence of post-diphtheritic paralysis and other sequelæ of diphtheria has been unduly high, especially amongst officers and their families during the past twelve months, throughout the North-West Frontier Province of India.

(2) At least one case has occurred of typical post-diphtheritic paralysis in a soldier with no antecedent history of sore throat or nasal discharge.

(3) In view of the prevalence of mild non-characteristic diphtheria, all cases of even *mild* sore throat should be looked on as potential diphtheria and should be swabbed, preferably on three successive days.

(4) Every case in the slightest degree clinically suspicious, or which does not react to symptomatic treatment in a few days, should receive *adequate* serum treatment at the earliest opportunity without waiting for positive swabs.

In other words: If in doubt give serum, and give it in adequate amount.

(5) Membrane (at any rate in macroscopic amount) is not a *sine qua non* even in faucial diphtheria, and every case of chronic nasal discharge, especially in children, should be swabbed as a routine.

REFERENCE.

- [1] "Diphtheria in Secunderabad," JOURNAL OF THE ROYAL ARMY MEDICAL CORPS, October, 1924.