The local treatment of diphtheria / by J.D. Rolleston.

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With the author's compliments.

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THE LOCAL TREATMENT OF DIPHTHERIA.*

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Since the introduction of antitoxin the local treatment of diphtheria has lost much of its former importance. Most authorities, however, are agreed that the use of serum should be accompanied by some form of local treatment such as syringing, gargling or painting. In this paper, which is based on 1000 consecutive cases that have been under my care in the course of the last four years, it will be shown that the number of cases in which local treatment is necessary is comparatively small. Of the total 1000 patients only 153 (15·3 per cent.) had any kind of local treatment. The character of the attack differed in many of these cases, such measures as will be seen from Table I being by no means reserved for the worst type of case. On the other hand, not all the severe cases received local treatment.

Table I. Local Treatment in each Class.

	Number of cases.	Percentage.
Class I . .	35 .	35·3
,, II . .	37 .	19·1
,, III . .	14 .	16·09
,, IV . .	8 .	2·9
,, V . .	7 .	2·3
,, VI . .	12 .	33·3

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The classification adopted in dealing with these cases has been based on the extent and duration of the membrane, and on the concomitant faucial œdema and glandular involvement. Each case, directly the membrane disappeared from the throat, was placed in one of six classes designated respectively "very severe," "severe," "moderately severe," "moderate," "mild," "very mild." From the following tables it will be seen how long the throat took to become clean, the day of disease and the day after the injection of antitoxin being respectively indicated.

	Table II. Average day of disease throat became clean.	Table III. Day after antitoxin throat became clean.
Class I (very severe) . .	10·40	6·27
,, II (severe) . . .	8·95	4·84
,, III (moderately severe) .	8·37	4·56
,, IV (moderate) . .	7·33	4·06
,, V (mild) . . .	6·45	3·27
,, VI (very mild) . .	5·08	Class VI had no antitoxin.

A striking feature in Table I is the comparatively large number of the very mildest cases that received local treatment. The reason for this is that cases so denominated were those in which the faucial deposit was so slight as to render antitoxin unnecessary. Such cases, which in earlier times were designated diphtheria sine diphtheria, and are now known as bacteriological diphtheria, were, as a rule, subjected to local treatment directly they came under observation, a close watch being kept, so that antitoxin should be given should topical measures prove insufficient. Such attacks were more frequently met with in older patients than in young persons. The average age of the thirty-six patients that belonged to this class was 9·0 years, which may be

regarded as a relatively advanced age, as the great majority of diphtheria patients (777 out of 1000) is below that age. I abstained all the more readily from a too hasty use of antitoxin for the older patients, since not only do they suffer more from the unpleasant sequelæ of serum injection, but also because they are less liable to post-diphtheritic paralysis than are younger persons, in whom, as I have pointed out elsewhere, the timely use of antitoxin renders paralysis less liable to occur. Not only is the age of the patients of Class VI above the average, but the age of all those that received local treatment is comparatively high.

In the case of children below the age of three I have entirely abstained from local treatment. In a disease like diphtheria, in which the strength must be husbanded and the heart spared any undue work, such as struggling and the concomitant emotion would entail, more harm than good is likely to ensue from local measures in the case of very young children. Further, not only is an indiscriminate local treatment to be deprecated on account of struggling, but also from the possibility of its exciting vomiting, which exercises so injurious an effect upon the heart. In hæmorrhagic forms of diphtheria severe hæmorrhage from the mouth and nostrils may be induced by syringing, so that the greatest caution must be observed in dealing with such cases. In laryngeal cases local treatment should on no account be employed, owing to the attacks of suffocation which it may provoke. Marfan, in his recent excellent work on diphtheria, has laid special stress on abstention in such cases.

It cannot be urged on behalf of local measures that the membrane disappears more rapidly when they are employed than it does without such treatment. Out of 165 severe cases 58, in addition to antitoxin, had the throat syringed, while 147 received antitoxin alone. The average period for the throat to become clean after the injection

of antitoxin was practically the same for those that had, and for those that had not had, local treatment, being 5·18 days in the former, and 5·05 days in the latter case, after the injection of antitoxin.

In severe cases of diphtheria, especially in children, the time during which local treatment is to be employed should be restricted as far as possible. It is important, therefore, to avail oneself of that period when local measures are most likely to be effectual in the removal of membrane without entailing any serious consequences. Before the antitoxin has had time to work, and while, consequently, the membrane is firmly adherent, little benefit is to be derived from syringing the throat. By the end of the first twenty-four hours, when the tactful nurse will have won the confidence of the child, resistance is less likely to be offered than it would be if such treatment were instituted directly after admission to hospital, when the child is too apt to regard all therapeutical measures with a hostile eye. If the treatment is well borne it may be employed two-hourly by day and four-hourly by night. During the time that syringing is continued careful watch should be kept over the heart and pulse. Early signs of cardiac involvement should serve as a danger signal to discourage persistence in the treatment. Such symptoms are most likely to occur about the 9th day of disease. It is advisable, therefore, that by this time all local measures should be discontinued.

Barlow has proved that the action of most of the throat lotions in common use is largely mechanical, to a less extent chemical and in a comparatively small degree germicidal, since the lotions are not of sufficient strength and do not remain long enough in contact with the tissues to exercise any marked bactericidal effect. Simple lotions such as warm boracic or even warm water act well in many cases. Where the oral fœtor is obtrusive, excellent

results may be obtained by a lotion of the following composition.

℞.	Pot. Chlor.	...grs. x
	Tinct. Myrrhæ	... ♏x
	Glycer. Borac.	... ℥j
	Aq. ad	... ℥j

To be diluted with an equal quantity of warm water before use.

This lotion should be used two-hourly in the day and four-hourly during the night. Gargles should only be employed in a comparatively small number of cases. With young children they are obviously inapplicable. Though more suitable for adults they require comparatively so much muscular effort which every diphtheria patient should avoid. Further they cannot well be used in the recumbent position which during the early stage of the illness it is desirable to enforce.

Disappearance of the characteristic fœtor, faucial œdema, and rhinorrhœa, and a decided diminution in the adenopathy usually occur before the membrane has entirely left the throat. When the former acute symptoms have subsided, it is not necessary to continue local measures, especially if the danger symptoms alluded to present themselves.

Table IV showing classification of 1000 cases.

	Cases.
1. Very severe . . .	99
2. Severe	198
3. Moderately severe . . .	87
4. Moderate	275
5. Mild	304
6. Very mild	37
	1000

As will be seen from Table IV cases of any degree of severity are less common than mild cases. In the great majority of patients belonging to classes IV and V the temperature soon falls, the tongue cleans, and the appetite returns in a very few days without any local treatment. Some days before the throat becomes free of membrane, such patients can take and digest solid food, which so far from causing pain acts as an admirable detergent. The presence of albumin in the urine is not a contra-indication to a liberal diet.

Children, as a rule, suffer much less pain in the throat in diphtheria than adults and often do not complain at all. This fact has several times been borne home upon me during my residence in a fever hospital. Remonstrance with the parents for not having sought medical advice before is silenced by the reply that the child did not complain or that it had been treated at home by the doctor for influenza, bronchitis, or mumps.

Adults on the other hand even with a comparatively mild attack may suffer considerable pain. Heberden's description of angina pectoris as dolor corporis, angor animi, applies in a lesser degree to certain forms of diphtheritic faucial angina. Adults, therefore, will welcome any form of local treatment, and may require other measures in addition to syringing the throat. Thus, to relieve dysphagia the sucking of small pieces of ice will often be found of service. When the faucial angina is extreme as in some cases of mixed infection spraying the throat with a 2 per cent. solution of cocaine affords considerable relief.

In conclusion it may be said that the restricted use of local treatment had no prejudicial effect upon the lives of the patients. The mortality among the 1000 cases was only 7·8 per cent., which, even making allowance for the number of mild cases included, must be regarded as low.

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