THE USE OF PLACENTAL EXTRACT IN AN EPIDEMIC OF MEASLES

BY

T. N. PARISH, M.A., M.D.,

Medical Officer to Benenden School

This is an account of an epidemic of measles in a girls' school in which placental extract was used as a prophylactic.

The girls vary in age from 13 to 17 years. There had been no such epidemic in the school for nine years, and at the beginning of the Easter term, 1938, of the 205 girls under my care eighty-nine had not had measles. On January 18, a few hours after the return to school, one child was found to be in the incubation stage of measles. She came by the school train and school bus, so that contacts were widely spread throughout the school. Prophylactic measures were discussed, and in view of the difficulty of obtaining convalescent serum, it was decided to use placental extract in an attempt to modify the subsequent attacks and to lower the complication rate. Moeller (1937) maintains that this extract is as efficacious as convalescent serum and of greater prophylactic value than adult serum. Parents were circularized, and forty-seven asked that their children should be given the injection, some of them requesting that this should be done at once. When the time of injection was left to our discretion the injection was given as soon as a case occurred in either the girl's house or form. All were given between January 27 and February 16. The term ended on April 3.

Dose and Reactions

The extract used was Lederle's immune globulin, and it was given in one intramuscular injection of 4 c.cm. into the buttock. There were no immediate reactions, but after a few hours stiffness and some pain at the site of injection were usual. The stiffness persisted for about two days. One child had a temperature for twelve hours, but in no case was there constitutional disturbance of any severity, nor did any delayed reactions occur.

Course of the Epidemic

The case incidence throughout the term, after the initial infecting case (which is not included in these statistics), is given in Figs. 1 and 2. Fig. 1 shows the day of onset of rash in the unmodified cases and Fig. 2 the day of onset in the modified cases.

Taking into consideration the larger number of cases in which the prophylactic injection had been given, it does not appear that the extract had any effect in delaying the onset of the attack.

By the end of the term seventy-five of the eighty-nine susceptibles had developed measles, as well as five of the 116 said to have had measles previously, of whom two had also received a prophylactic injection. The distribution of cases in the modified and unmodified groups is shown in Table I.

TABLE I.—Incidence of Measles

	Previous Measles (116 Cases)		Susceptible (89 Cases)	
	Modified (2 Cases)	Unmodified (114 Cases)	Modified (45 Cases)	Unmodified (44 Cases)
Measles developed ..	2	3	42	33
No measles	0	111	3	11

It is obvious that the extract had no effect whatsoever in preventing the attack of measles. On the contrary, the above figures show that among the susceptible cases measles developed in 93 per cent. of those who had been given the modifying injection and in only 75 per cent. of those who had not. The two children who had previously had measles, and who had also been injected, both developed measles.

The epidemic was of moderate severity, although there was a most remarkable freedom from serious complications. Temperatures of over 103° were present in 66 per cent. of the total cases. The only complication of any severity was one case of suppurative otitis media.

Effect of Extract on Attack

The effects of the prophylactic injections were much more noticeable in the first half of the term. It is not possible to convey a clinical impression by statistics, but the impression received by all observers was that those cases in which the attack developed within three to four weeks of the injection suffered far less constitutional disturbance. A few of these showed a slight rash of small discrete papules with no tendency to coalesce, but on the whole little difference was observed in the rashes of the "modified" and "unmodified" cases. The most noticeable feature of the recently modified cases was that, although the temperature was high and a well-developed rash was present, the patient remained surprisingly cheerful and undisturbed, and did not present the typical woebegone facies and prostration.

The cases were classified (Table II) as they occurred as mild, moderate, or severe, this classification being based on the degree of constitutional disturbance. This is necessarily a somewhat arbitrary classification, for the degree of disturbance did not appear to have any relation to the temperature or nature of the rash.

The effect of the extract in reducing the severity of the attack is most noticeable in those cases in which it had been given within three weeks of onset of rash.

FIG. 1.—Unmodified cases (36).

FIG. 2.—Modified cases (44).

TABLE II.—*Type of Attack*

	Total Cases	Mild	Moderate	Severe
Unmodified	36	17%	78%	5%
Modified	44	50%	45.5%	4.5%
Modified within 3 weeks of onset ..	19	74%	26%	—

Table III contrasts the behaviour, during the attack, of the unmodified cases with that of the total modified cases, and with those cases in which the extract was given within three weeks of the onset of the rash.

TABLE III.—*Course of Attack*

	Koplik's Spots	Days under Observation Before Onset of Rash	Days Temperature After Onset of Rash	Temperature over 103°
Unmodified	61%	2.6	3.4	72%
Modified	36%	2.8	2.6	61%
Modified within 3 weeks of onset ..	26%	2.5	2.0	74%

The most noticeable features of this table are the lowering in incidence of Koplik's spots and the quicker fall in temperature after the onset of the rash in modified cases. Both these features are more marked in the recently modified cases. The temperature of the recently modified cases is noticeably high, which is anomalous in comparison with the other results, but may be related to the apparent increase in susceptibility following injection of extract.

Complications

Apart from the one complication of bilateral suppurative otitis media, there were no serious complications. The complications given in Table IV are chiefly accounted for by the persistence of what may be regarded as normal concomitants of measles. Apart from the one case of suppurative otitis media in which paracentesis was performed, all cases of otitis were of the catarrhal type.

TABLE IV.—*Complications*

	Total Cases	No. Complicated Cases per Cent.	Acute Conjunctivitis	Styes	Persistent Nasal Catarrh	Sinusitis	Laryngitis	Persistent Bronchitis	Otitis Media	Total Complications per Cent.
Unmodified	36	61	8	2	3	1	—	8	5	75
Modified	44	25	1	1	2	1	2	3	5	34
Modified within 3 weeks ..	19	5	—	—	—	—	—	—	1	5

There is a remarkable freedom from complications in the modified cases. The one complication in the recently modified cases was the case of suppurative otitis media, and this occurred in a child who had previously suffered from bilateral otitis media and mastoiditis, and who had received her injection only eight days before the onset of the rash.

Discussion

The great defect in prophylaxis of measles, whether by convalescent or adult serum or by placental extract, is the difficulty in estimating when exposure has been intimate enough to ensure subsequent development of an

attack. In a large girls' school there are many opportunities for contact with cases in the incubation stage, but these contacts may be brief and not sufficient to produce an attack.

It was unfortunate that the epidemic started so soon in the term; for it seems probable, from a study of other reports (McKhann, 1937) and from the results obtained during this epidemic, that the passive immunity conferred is of short duration and that immunity decreases rapidly after three weeks.

By mid-term it is probable that most of the immunity conferred by the placental extract had vanished. Fortunately it does not appear that the extract in the doses given prevented or delayed the development of measles. Crosbie (1938) found that 4 c.cm. of placental extract was not always sufficient to ensure a modified attack, although it did prevent complications and sequelae. It is probable that if a dose larger than 4 c.cm. had been given in this epidemic the immediate modifying effect would have been more pronounced, but there would then have been a greater risk of postponing the peak of the epidemic until later in the term, by which time the modifying power would have been greatly diminished. In a school epidemic it seems wiser to recommend for "modification" a dose which may in some instances fail to modify, although preventing complications, for such a dose will be less likely to bring about complete prevention.

There was a remarkable freedom from serious complications in the epidemic, and this renders the estimation of the value of the extract in reducing the complication rate less conclusive. If, however, by the use of the extract, the reduction obtained in the number of somewhat trivial complications may be taken as an indication of its power in preventing major complications in some less fortunate epidemic, then the value of the extract is undoubted.

Apart from deliberate exposure of susceptible cases with a coincident modifying injection, the ideal course to adopt in an epidemic would be to immunize susceptible cases at intervals of three weeks until an attack developed. This would involve considerable inconvenience and expense, and in an epidemic of the type described, in which serious complications were absent from the start, it does not seem justifiable to advise this procedure.

Summary

An epidemic of measles in a girls' school is described in which placental extract was used in an endeavour to reduce the severity of the attack and the subsequent complications. There were no serious reactions following the injections. The extract did not have the effect of preventing or postponing the attack: it rendered the attack milder, the duration of temperature shorter, and lessened the subsequent complications. It is probable that the immunity conferred diminishes fairly rapidly after three weeks.

REFERENCES

- Crosbie, W. E. (1938). *British Medical Journal*, 1, 1003.
McKhann, C. K. (1937). *New England J. Med.*, 216, 450.
Moeller, U. (1937). *Mtschr. Kinderheilk.*, 69, 101.

The next annual meeting of the Society of German Neurologists and Psychiatrists will be held at Cologne from September 25 to 27, when the subjects for discussion will be Meinert's, Wernicke's, and Kraepelin's doctrines and their importance in modern psychiatry. Further information can be obtained from Professor Nitsche, Pirna, Bezirk, Dresden.