that practically all asphyxiated newborn infants which do not respond to treatment within the first minute or two are suffering from intracranial injuries, and that the older and violent methods of resuscitation, if used, will further increase these injuries by causing increased haemorrhage. If an asphyxiated infant is going to respond to any form of resuscitation, I am sure no more treatment is needed than to remove any mucus from the throat, and to encourage attempts at respiration by gentle traction on the tongue with tongue forceps at the rate of about twenty pulls per minute, together with the injection of a cardio-respiratory stimulant such as coramine or icorol.

Should the infant attempt to breathe, carbon dioxide is here of some use. The older methods of throwing the child from one hand to the other or of violently flexing its body should never be allowed to be used on an asphyxiated newborn infant, as all such infants should be considered as having potential brain injuries, and small haemorrhages may soon prove fatal if unnecessarily aggravated by vigorous manipulations during resuscitation.

RECURRENT VOMITING ATTACKS IN CHILDHOOD

WITH SPECIAL REFERENCE TO ALLERGIC FACTORS *

BY

K. H. TALLERMAN, M.D., M.R.C.P.

ASSISTANT PHYSICIAN TO THE CHILDREN'S DEPARTMENT, LONDON HOSPITAL; PHYSICIAN TO PADDINGTON GREEN CHILDREN'S HOSPITAL

Recurrent attacks of vomiting, or so-called "bilious attacks," occur with sufficient frequency in childhood to be of real importance in clinical practice. Though not usually causing prolonged illness, they are often most inconvenient to the children concerned on account of their repeated interference with school life, while they may at times be severe enough to necessitate admission to hospital.

Wyllie and Schlesinger¹ have recently discussed a group of cases of this type under the heading of "The Periodic Group of Disorders in Childhood." Such a title has certain advantages, the chief being the emphasis it lays upon the tendency of these attacks to recur. "Cyclic vomiting" is a term often used for the attacks, but this rather implies a regularly recurring cycle, and any absolutely regular periodicity of the attacks is actually very rare, if indeed it ever does occur. Again, these children are often said to be suffering from attacks of acidosis. This is mentioned in order to draw attention to the fact that there is usually no justification whatever for such a diagnosis, although acidosis may accompany severe attacks of vomiting. It is of course well known that at the time of attacks these children do suffer from varying grades of ketosis. The term "ketosis" is, however, by no means synonymous with acidosis, and in fact true acidosis is not usually met with in childhood except as a relatively rare accompaniment of such diseases as diabetes, nephritis, and acute gastro-enteritis.

The aetiology of the recurrent attacks of vomiting under discussion is by no means clear. They are probably a manifestation of some metabolic disturbance, and Josephs² has shown that they may be associated with a hypoglycaemia. This being so, the accompanying ketosis is therefore explicable on the basis of an insufficient supply of carbohydrates being available for the proper metabolizing of fats. In these patients the clinical improvement effected by restricting fats and giving glucose is evidence favouring this explanation. It should, however, be mentioned that not all cases show a hypoglycaemia, and that

the theory of hypoglycaemia as an important aetiological factor has not been definitely established. Whichever is primary, the ketosis or the vomiting, the fact remains that between attacks these children are generally healthy, with, so far as one can judge, no evidence of ketosis or of any other metabolic disturbance, and one is still ignorant as to the exact factor which initiates an attack. It has been shown that some at least of the children can tolerate a definite ketosis produced artificially without an attack being precipitated.

It is recognized that gastro-intestinal symptoms may be a manifestation of allergy, and Rowe³ regards gastro-intestinal food allergy as occurring most frequently in infancy and childhood. It appears quite possible, therefore, that allergy may play a part in the production of these recurrent attacks of vomiting, and that sensitivity to some foodstuff may be a determining factor in their onset. With this aspect of the problem particularly in view, the following study was undertaken.

Investigation of Forty Cases

So far as possible, all children were selected for study who came to my out-patient sessions in the Children's Department of the London Hospital between January, 1932, and August, 1933, suffering from recurrent vomiting attacks. Personal and family histories were investigated, all significant data in regard to clinical findings were recorded, various investigations were carried out, treatment was prescribed, and progress was followed in each case. An attempt was then made to correlate the findings in the entire series, and to draw conclusions therefrom. As in every case reliance had to be placed on the history obtained from the mother and upon her account of subsequent progress, it was obvious that accuracy in certain of the data was open to question. This, however, is invariably the case in any clinical study of this nature involving observation of out-patients.

The series here presented consists of forty cases; as is inevitable, certain other patients who were originally included defaulted before adequate observations could be carried out, and had therefore to be omitted. Of this series all the children attended quite regularly except three, each of whom for some time failed to come up as requested. The maximum period of observation was twenty-seven months and the minimum five months. The average period of attendance during which observations were made was sixteen and a half months; only two children were observed for less than six months. Reports of progress were subsequently obtained in regard to four of the children after attendance had lapsed.

Character of Attacks

It soon became apparent that there was no absolute uniformity in the duration of individual attacks, and, generally speaking, no regular periodicity in their occurrence. Often a child who was, at the time of first attendance, said to have an attack every two or three weeks, was found thereafter to have such attacks only at very infrequent intervals. Even in the history given by the mothers any account of regularity of attacks was infrequent. It is really impossible to make any useful analysis of the frequency or duration of these attacks. In most cases the vomiting was accompanied by headache, which was sometimes the most outstanding feature of the attack. This will be discussed later.

The average age at the time the children were first examined was just under seven and a half years. In twelve cases the attacks were said to have commenced before the age of three years, in thirteen cases the onset apparently occurred between the ages of three and five years, and in fifteen cases between the ages of five and ten years.

* From the Children's Department, London Hospital.

Precipitating Cause

In twenty-three of the cases the mother stated that she had no idea what initiated the attacks; in the remaining seventeen cases various factors, such as fatty foods or excitement, for example, were suspected to be associated with the onset of an attack. From these histories, however, one is forced to take the view that any exact knowledge of what precipitates an attack must be uncommon. Excess of fats does, however, appear to be a factor in certain cases, and some of the children in the group observed have a dislike, possibly physiological, of fatty foods. Constipation may well be an associated factor, but discussion of this is apt to be misleading on account of the difficulty of obtaining a reliable history in this respect. It should be recognized that the criteria among hospital out-patients as to normal and abnormal actions of the bowels are extraordinarily variable and frequently fantastic.

Allergic History

The allergic history is a matter of some importance, in view of the fact that it had been considered that the attacks themselves might be of an allergic nature. Of the forty children, four gave a personal history, present or past, of some manifestation usually regarded as allergic—namely, asthma (one case) and urticaria (three cases). In eighteen cases—that is, 45 per cent.—a family history of allergy was obtained, this being very pronounced in five. As it seemed possible that such a proportion of family histories of allergic manifestations might well be obtained in any similar group of children, a control series was investigated. Forty children attending hospital as out-patients, who gave no history at all of bilious attacks or headaches, were taken without selection. None of these gave a personal history of any allergic manifestation. A family history of allergy was obtained in only ten—that is, 25 per cent.—of this control group, and in only three of these was such family history really pronounced. There is therefore a much higher incidence—almost double—of history of allergic manifestations in the families of the children suffering from vomiting attacks than in those of the control series of cases.

Skin Tests, Blood Counts, and Gastric Acidity Tests

Each child in the series was skin-tested with extracts of all the articles of food usually regarded as most commonly responsible for producing allergic phenomena. The extracts used for testing were put up by Messrs. Duncan, Flockhart and Co., and consisted of: wheat, oatmeal, rice, potato, egg white, whole cow's milk, cocoa, beef, pig group (pork, bacon, lard), crustacea (group extract), and fish group (cod, herring, haddock, whiting, plaice, mackerel). A control solution was also employed in carrying out the test. Before applying the test the arm was in every case gently washed over with spirit. The results were very disappointing. In only one case was a slight but definite positive reaction obtained, this being to egg; in this case the mother had stated, on first bringing the child to hospital, that no food appeared to upset her. In five other instances certain reactions were regarded as possibly positive, but clear-cut positive reactions were not obtained, except in the one case mentioned. Skin testing in these children proved, therefore, to be of no assistance. It is, however, recognized that a negative skin test does not necessarily mean that a child is not allergic to the substance tested, and Rowe³ states that skin reactions are infrequently obtained in cases of gastro-intestinal allergy.

Blood counts were carried out in all except one of the cases, because of the fact that eosinophilia is generally accepted as being an accompaniment of the allergic state. No child in the series showed a conclusive eosinophilia,

but in seven cases the eosinophil count could at some time be regarded as slightly above normal, amounting to between 5 and 9 per cent.

It has been shown that in certain allergic conditions there exists a hypochlorhydria and a tendency towards alkalosis (Bray,⁴ Beckman⁵). With this in view test meals were carried out on thirteen of the children under investigation, who were admitted to the ward for this purpose. These cases were selected as being the most likely to yield significant results in view of a definite associated family history of an allergic nature. The meal given was the ordinary Ewald meal, on an empty stomach. Possibly different results for secretion of acid might have been obtained if histamine had previously been injected, or if fractional test meals had been employed, as in Bray's⁴ series of cases. At the same time, since a control series was treated in exactly similar fashion, it seems justifiable to make a comparison between the results of a simple Ewald meal in the two groups.

In seven of the cases investigated free hydrochloric acid was found to be absent. In two it amounted to 0.04 per cent., in one to 0.05 per cent., in one to 0.07 per cent., in one to 0.08 per cent., and in one to 0.17 per cent. The percentages given are those of mineral acid calculated as HCl. Taking the normal values of total acidity as lying between 40 and 60 (acidity of 100 c.c.m. test meal in terms of cubic centimetres of decinormal acid) two cases gave normal and ten subnormal values, while in one a high total acidity of 77 was found. A control series of test meals was carried out on twenty children of the same class, who were in hospital convalescing from various medical conditions not of a digestive nature. In this series twelve had a complete absence of free HCl, and in four others the free HCl was below 0.1 per cent.; six gave normal and thirteen subnormal values for total acidity, while in one a high total acidity of 85 was found. One cannot, therefore, from consideration of this series, argue that the absence of free HCl, or low total acidity, in children suffering from recurrent vomiting is of any particular significance.

General Physical Signs

Several children in the series had some entirely extraneous disability, such as a rheumatic cardiac lesion. Excluding such findings there were no abnormal physical signs except what was regarded as a raised blood pressure, which was found to be present in eight of the cases under review. Raised blood pressure as a feature of some cases of the type under discussion has already been observed by Wyllie and Schlesinger.¹ Its significance is not clear, but it may be noted, as they point out, that adults with essential hyperpiesia not infrequently give a history of migraine in early life. In thirty-seven of the cases whose urines were tested between attacks by Gerhardt's ferric chloride test, no diacetic acid was found: this is what one would expect.

Association of Headache with Vomiting

Special mention must be made of the association of headaches with these attacks of vomiting. Ophthalmic examinations to exclude errors of refraction were carried out in all cases of severe persistent headache. In no case did it appear that such errors were responsible for the attacks. It is well recognized that headache is usual at the time of such attacks, but in a number of cases the type of headache is such as to justify one in classing it as definitely migrainous. Again, certain cases under observation, which came for examination primarily because of symptoms typical of migraine (severe recurrent prostrating headache, sometimes accompanied by visual phenomena), complained of vomiting at the time of the attacks. There seems to be so close an association between these two

symptom-complexes that it is questionable whether in a number of cases they can be accurately separated. It is probable, therefore, that severe recurrent bilious attacks in childhood should be regarded as atypical manifestations of migraine.

It may be mentioned in this connexion that various observers regard migraine as being due to food allergy. Balyeat and Rinkel⁶ are of the opinion that in about 30 per cent. of all patients with migraine, symptoms have developed during the first decade of life, and that many cases of so-called cyclic vomiting may actually be cases of migraine in childhood.

Treatment and Progress

These are being discussed under one heading on account of their interrelationship.

The general lines of treatment adopted may be stated to consist essentially of:

1. The ordering of a low fat diet with liberal carbohydrates. The mother received detailed instructions regarding the types of foodstuffs to be given.

2. The prescribing of luminal, to be given at the time of attacks of severe headache, to children prominently exhibiting this symptom.

In certain cases in which a particular article of food was regarded as a possible causative factor in precipitating an attack, this was eliminated from the diet for a short period. This did not appear to make any difference, nor, in fact, did the giving of such foods seem to cause any particular upset.

One is faced with the greatest difficulty in assessing the effects of treatment and the progress of the children because of the impossibility, already mentioned, of obtaining from the mothers accounts that can be regarded as strictly reliable. Recognizing these difficulties, which are inherent in any study of this type, it is possible to make only the broadest assessment of progress in relation to treatment. Three children were not given any special dietary instructions at all. Of the remaining thirty-seven the patients were dieted for periods ranging from six weeks to twenty-one months, the average duration of the dieting being nine and a half months. Extra sugar as well as very restricted fat was ordered in most cases at the outset; later it was usual only to restrict the fats. Apart from six of the children who had no further attacks from the time of first coming under observation, there remain thirty-four cases for consideration. Of these, twenty-seven improved under dietetic treatment, and the improvement was maintained subsequently when an ordinary diet was allowed. In seventeen of these patients the improvement was regarded as very marked. Three failed to show improvement, and in two cases the improvement was doubtful. Two patients improved under dietary treatment, but regressed when given ordinary diet without fat restriction.

However great the improvement may have been, and even if no attacks were observed while the child was attending, the time of observation hardly permits one to speak of an absolute cure having been effected. There seems, however, to be little doubt that, when children suffering from recurrent vomiting attacks are ordered a diet in which the fats are much restricted, a general improvement is usually effected, and this appears to be lasting.

Summary and Conclusions

A study was made of a series of forty children suffering from recurrent attacks of vomiting, and in particular evidence was sought as to whether or not the attacks were associated with an allergic state.

There was found to be a definite family history of some allergic disorder in a considerably greater proportion of the children in this series than in a second series of

children taken as a control. Apart from this no definite evidence of allergy was found. Generally speaking, skin tests failed to reveal sensitivity to any of the common foodstuffs.

The association in childhood of recurrent vomiting attacks with migraine is emphasized and discussed. Severe vomiting attacks in childhood are probably atypical manifestations of migraine.

Treatment consisted essentially of restriction of fats in the diet. From the generally favourable progress made by these children it would appear that good results may be expected from this line of treatment in the majority of cases, and that the improvement effected is likely to continue after a normal diet has been resumed.

I should like to thank Dr. Panton and Professor Marrack, in whose departments certain of the investigations were carried out, Dr. W. G. Bray for helpful advice, and the Research Committee of the London Hospital, who kindly assisted me with a grant.

REFERENCES

- ¹ Wyllie, W. G., and Schlesinger, B.: *Brit. Journ. Child. Dis.*, 1933, xxx, i.
- ² Josephs, H.: *Amer. Journ. Dis. Child.*, 1926, xxxi, 657.
- ³ Rowe, A. H.: *Journ. Amer. Med. Assoc.*, 1931, xcvi, 1440.
- ⁴ Bray, W. G.: *Recent Advances in Allergy*, J. and A. Churchill, London, 1931, p. 165.
- ⁵ Beckman, H.: *Journ. Amer. Med. Assoc.*, 1930, xcv, 1582.
- ⁶ Balyeat, R. M., and Rinkel, H. J.: *Amer. Journ. Dis. Child.*, 1931, xlii, 1126.

NEW CASES OF WAR BLINDNESS DUE TO MUSTARD GAS

BY

REGINALD E. BICKERTON, D.S.O., M.B.

CH.B., T.D.

OPHTHALMIC SURGEON, ST. DUNSTON'S

Surprise is often expressed by the lay public, and sometimes even in medical circles, that men are still being admitted to the benefits of St. Dunstan's organization as being blinded from the results of the war. That there are many men with damage to the brain from bullet wounds, which years later have resulted in injury to the brain tissue from the effects of scarring and traction, is readily understandable; that these changes cause damage to the optic paths and optic centres, and result in blindness, more or less, is also quickly appreciated when an explanation is called for. But such explanations are comparatively rarely required, because the general public thinks that, since the war ended sixteen years ago, any after-effect of head wounds in the way of blindness would have shown itself much earlier.

Numbers of clear, well-authenticated cases of this nature are on record. In this article, however, it is not intended to touch upon these, but upon a variety of war injury which causes an immense amount of untold suffering, years of treatment, and, unfortunately, progressive loss of already much impaired vision, and the occasional loss of eyes themselves. I refer to the men who were badly gassed by shell and cloud mustard gas, and whose conjunctivae, particularly the lower fornices, are as irritable and inflamed to-day as they were after the acute effects had more or less passed off in 1917, 1918, and 1919. Very considerable oedema of the conjunctiva and lids first occurred, which slowly settled down, leaving a chronic conjunctivitis of such nature and severity that one can but conclude that some change in the tissues has taken place resulting in the loss of some lubricating secretion present in the normal eyelids and conjunctivae. This change would appear to be the total destruction of the mucin-secreting glands, a change which seems to have taken place in those distressing cases of essential shrinking of the conjunctiva and xerophthalmia.