the amount of glycosuria is said to be usually constant and independent of diet and the level of the blood sugar. This has not been true, however, in my experience of non-diabetic renal glycosuria.

In two of these diabetics the lowered threshold has remained constant for five years, and in none, observed over shorter periods, has it been found to vary. There is every reason to think, therefore, that the peculiarity is a permanent one, as renal glycosuria seems to be.

In addition to these eight cases, a lowered threshold appeared temporarily during pregnancy in two diabetic women, but became normal again after labour.

Practical Importance of the Condition.

These cases seem, on the whole, to follow the same course as diabetes with a normal renal threshold. They have not seemed more liable to ketosis than other cases, because they have not lost sufficient sugar in the urine to affect materially the ketogenic-antiketogenic ratio of the diet as fed. But one of the pregnant women, who was losing some 30 grams of sugar a day by the third month of pregnancy owing to the low threshold, excreted more ketone bodies than previously. The fasting blood sugar level might have been expected to be lower than usual from the loss of sugar, but this was not noticeable. However, two of the youngest patients, who had for years after the original discovery of their diabetes paid little attention to their condition, seemed to deteriorate much less rapidly than the usual careless juvenile diabetic. One of these patients gave little heed to diet for seven years, was thirsty, and had a blood sugar of nearly 0.3 per cent. when tested, and yet became rapidly controlled on diet without insulin, and has remained so since. Another, a girl of 12, had diabetes for seven years without any marked progression, and always responded at once to dietetic treatment. It seems possible that the low leak point acted in these cases as a safety valve, which tended, by the loss of sugar in the urine, to lower the blood sugar and relieve the strain on the islet cells. This is my impression in these two cases, but, of course, they may have been exceptionally unprogressive for other reasons.

It would appear that these cases respond to treatment in the usual way, but they certainly present some difficulty in their management. It is impossible to keep the urine sugar-free if the threshold is below 0.1 per cent. The usual urine sugar tests give little or no indication of the patient's real condition, which can be known by blood sugar tests alone, difficult to carry out frequently, and sometimes impossible. It is very disappointing to the patient, and the practitioner, to find sugar almost constantly present in spite of treatment, and the patient, at least, is apt to be depressed. It is best for these patients not to be taught to test their urine or to co-operate as much as usual in their treatment. If the threshold is lowered to only 0.14 per cent. or so, this may be almost an advantage in treatment, as one may then be certain, if the urine is sugar-free, that the blood sugar is normal.

It is difficult to see any etiological connexion between the lowered threshold and diabetes in these cases. It is highly improbable that the diabetes produces in some way a lowering of the threshold, for any change that is known to take place in diabetes is in the direction of a rise in the threshold; nor is there any clear evidence that a pre-existing condition of renal glycosuria may tend to produce or be followed by true diabetes. Indeed, Hjärne⁴ has recently published a hereditary study of renal glycosuria which tends to show the absence of any connexion between diabetes mellitus and renal glycosuria.

The most likely explanation of these cases is the fortuitous development of true diabetes in cases of renal glycosuria. It is now well known that a lowered threshold is fairly common in normal individuals, though what percentage of the population are renal glycosurics it is impossible even to guess; but the number of cases of renal glycosuria that are discovered must be very small compared to the number existing. The above eight cases have occurred among some 500 diabetics—an incidence of 1.6 per cent., not a high one, probably no higher than in the non-diabetic population. Quite likely among my 500 diabetic cases others with a lowered threshold have escaped discovery, because it requires

close observation and not infrequent blood sugar tests (not possible in every case) to establish the condition. There seems no reason to think that the combination of diabetes mellitus with a lowered renal threshold is not a mere coincidence.

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VOMITING IN INFANCY.

BY

T. M. LING, M.A., B.M., B.Ch.Oxf.,

JOHN AND TEMPLE RESEARCH FELLOW IN DISEASES OF CHILDREN,
ST. THOMAS'S HOSPITAL.

VOMITING is a very common presenting symptom during the first few months of life, and one about which the mother is not unnaturally anxious, as it signifies to her that her child is not getting sufficient nourishment.

In the act of vomiting the walls of the stomach contract, the diaphragm is pushed downwards in the full expiratory position, while powerful contractions of the abdominal muscles take place; at the same time the cardiac sphincter is relaxed and the gastric contents are expelled, chiefly as the result of the pressure exerted in the abdomen by the diaphragm and the abdominal muscles, aided to some extent by reversed peristalsis. As a general rule the pyloric sphincter is closed, but in some cases it may become relaxed, with the result that bile and intestinal contents are expelled with the vomit. The simplest method of bringing this mechanism into play is to overfill the stomach, especially if this is done rapidly before the walls of the stomach have time to adapt themselves to the sudden increase of gastric contents. Thus it is extremely common for breast-fed babies to vomit a small amount at the end of their feeds. Provided the gain in weight is within normal limits no treatment is required, and the symptoms may be regarded as one of Nature's "safety valves." If, however, it is found that the baby is gaining weight excessively, a little water should be given beforehand and the actual length of time spent over each feed decreased.

Vomiting from Birth.

All cases in which such a history is given should be regarded seriously, as a congenital obstruction of the duodenum is a possible cause. It is also important to realize that the symptoms of congenital pyloric obstruction may date from birth. As a general rule the vomit in the former is bile-stained, and jaundice may occur, but the distinction between the two conditions is really only of academic interest, as surgical intervention is indicated in both.

Various congenital malformations of the oesophagus that produce intractable regurgitation of food dating from birth are occasionally encountered. Some form of fusion of trachea and oesophagus is the most common deformity, and screening with the x rays may sometimes show conclusive evidence of obstruction. Treatment is of no avail.

Vomiting with an Acute Onset.

The sudden onset of vomiting, associated with diarrhoea, in an apparently healthy baby suggests immediately the possibility of an infection, of which the most likely site is the gastro-intestinal tract, particularly in artificially fed children. It is important, however, to realize that paren-teral infections may produce exactly similar symptoms; the most common of these are pyelitis, bronchitis, and otitis media. Recent work, both in this country and in America, has drawn attention to the great frequency of acute pyelitis in babies, and unless the urine is examined the condition is frequently missed. In severe cases the onset is sudden, with marked fever, vomiting, diarrhoea, and convulsions or rigors; the latter are uncommon in children, and should always suggest an acute kidney infection. Other cases have a more insidious onset, with vomiting and persistent loss of weight as the outstanding features. It is essential in

any suspicious case to obtain a specimen of urine, which may be done most easily by placing the child on a mackintosh sheet and securing the urine that collects at the most dependent part. If the case is one of pyelitis the urine will be definitely turbid, and will show pus cells and motile bacilli under the microscope. The vast majority of such cases are due to infection with *B. coli*, and the essential part of the treatment is to administer large doses of alkali; 10 grains of potassium citrate and of sodium bicarbonate can be given with safety every three hours to a child of 6 months. The best criterion of the progress of the treatment is the reaction of the urine, and it is advisable to provide the mother with litmus paper and instructions to continue giving the medicine at frequent intervals till the urine is alkaline.

Acute infections of the middle ear are very common in children of all ages, and here again the usual presenting symptoms are screaming, vomiting, and sometimes diarrhoea; unless the drums are inspected in any suspicious case the first indication of local trouble will be the presence of a discharge.

Naturally the gastro-intestinal tract will require treatment irrespective as to whether it is the primary site of infection or not. A preliminary dose of castor oil—a drachm for a baby of 6 months—is advisable when the case is seen early, but is actually harmful in the later stages. A period of starvation of about eight to twelve hours' duration should follow, during which saline is given freely. If vomiting is marked a preliminary stomach wash is indicated, and later, food in small quantities. Boiled breast milk is ideal, but in its absence a half-strength dried milk mixture with a low sugar and fat content may be used.

The vomiting of acute intussusception is nearly always characteristic and the clinical picture of the condition distinctive. Emphasis should perhaps be laid on the suddenness of the onset and the periodicity of the pain; thus the mother may describe exactly the time of onset, and the baby itself will usually lie quite quiet between the attacks of pain and screaming. A rectal examination is especially important in diagnosing an early case, as the presence of blood may be detected in this way some time before it becomes visible on the napkin.

Vomiting with a Chronic Onset.

Very frequently the mother will complain that vomiting occurs shortly after each breast feed and is accompanied by prolonged screaming, the latter being especially marked at night. Such a history suggests a diagnosis of under-feeding. In breast-fed babies, whenever the question of the quantity of food is in doubt, test feeds are called for. These can be carried out with great ease in any intelligent household provided fairly accurate scales are available, and the determination of the weights before and after every feed during twenty-four hours eliminates the need for calculations. Only on this principle is it possible to treat feeding difficulties with any measure of success; any other way involves guesswork. As a simple working rule it should be remembered that a child requires about 2½ ounces of breast milk per pound body weight per day, and if test feeds are carried out it is a simple matter to adapt the diet accordingly.

Vomiting *per se* may indicate overfeeding or under-feeding; in the former case it is due to the rejection of surplus food by an overfilled stomach, and in the latter to the regurgitation of air swallowed to compensate for the inadequate quantity of milk. The weight chart is naturally of great help in such cases, and test feeds will decide the extent of the discrepancy.

Congenital Pyloric Stenosis.

Vomiting is undoubtedly the predominant symptom of this condition, and in many cases the details provided by the mother make the diagnosis almost a certainty. The symptoms usually start at about the third week of life, and become progressively more severe and more characteristic. The child snatches at the breast or bottle for a few minutes and then vomits very forcibly, so that the food is ejected well beyond the cot. The motions are small and hard, and

the child loses weight steadily. In making a diagnosis it is absolutely essential to watch the child being fed, as gastric peristalsis can be seen in an early case only during an attack of vomiting. The detection of the tumour is largely a matter of patience; it is important that the abdominal wall should be well relaxed, and this condition is most easily secured when the child is asleep; in difficult cases the examining fingers should be worked up under the liver margin as the tumour may be quite high up in the abdomen.

It is now generally agreed that Rammstedt's operation is the correct treatment for this condition, but before it is actually undertaken attention should be paid to the following points, upon which depends very largely the success or otherwise of the operation.

1. Re-establishment of breast-feeding. Very frequently the persistent vomiting and loss of weight have been taken as indications that breast milk does not "agree" with the baby, and by the time the child is seen weaning may have occurred and perhaps two or three artificial foods tried without success. In many cases it is possible partially to re-establish breast secretion, and this should be done by putting the child to the breast regularly, and by breast massage. It will usually be necessary to give some artificial food in addition, but this should only be done after the baby has been put to the breast. Even small quantities of breast milk are invaluable for the feeds immediately following an operation.

2. Daily stomach washes should be instituted as soon as the diagnosis has been made, and it is surprising how much improvement may be brought about in the clinical condition of the baby in two or three days. A solution of sodium bicarbonate (a teaspoonful to the pint) should be used and the procedure carried out about two hours after a feed; incidentally the amount of residue is a measure of the degree of stenosis and of the urgency for operation.

3. Subcutaneous saline should always be given immediately before operation, and, if the baby is at all wasted, it should be started as soon as the diagnosis is made and given regularly twice a day for two or three days.

From the above considerations it can be seen that it is advisable in the majority of cases to wait three or four days before undertaking operation so as to improve the general condition of the baby by medical means.

Habitual Vomiting.

From time to time cases are seen in which no dietetic error or organic disease can be found to account for the persistent vomiting that occurs usually just after a meal. There is frequently a neuropathic family history in such cases, and the baby itself is very restless, and cries at the least noise or distraction. It should be noted that some degree of peristalsis may be seen in these patients, although no pyloric tumour is palpable, and the progress of the condition will negative the latter diagnosis. By far the best treatment for such a condition is to thicken the feed with flour or fine oatmeal. In an ordinary case about half an ounce of flour may be added to a pint of milk mixture and the whole brought to the boil and allowed to simmer for ten minutes. The resultant mixture will be a thin gruel that will flow through a large hole in a teat. In pronounced cases that do not respond to this treatment it is necessary to use a thick cereal food that has the consistency of treacle. Such a food may be made by allowing about 2 ounces of flour to each pint of milk and boiling the mixture gently for at least half an hour. From 2 to 4 ounces may be given at each feed, though naturally it will be necessary to supply the requisite amount of fluid by giving drinks of water between the feeds.

Some help may be obtained in cases of habitual vomiting by the use of a chin strap applied immediately after a feed, and from the administration of small doses of atropine and bromide. A convenient mixture is:

Solution of atropine sulphate (1 in 1,000)	...	2 minims
Sodium bromide	...	1 grain
Chloroform water	...	to 1 drachm

This should be given about half an hour before the feeds. As a general rule, however, it will be found that adequate thickening of the feeds is the essential part of the treatment, and the rapid improvement that ensues in the condition of the child is the surest proof of this.