and perhaps tremor. If the blood sugar continues to fall there is restlessness and sometimes a state like that of drunkenness. Ultimately the patient becomes unconscious, and, if unrelieved, passes into a state of actual coma.

Similar attacks have been described as occurring spontaneously in non-diabetic individuals. In some such cases a tumour of the pancreas has been found, the mechanism being that of excessive insulin production by the growth. In other cases the liver is at fault. Such abnormal functioning of the liver may be of diametrically opposite types. There may be deficient function leading to inadequate maintenance of glycogen reservoirs or liver over-efficiency, as a consequence of which there is an excessive storage of carbohydrate as glycogen leading to impoverishment of the blood and tissues in sugar. No doubt fainting attacks due to such spontaneous hypoglycæmia are rare but the possibility should be kept in mind in doubtful and unusual cases of recurring faints, particularly with associated features such as those described. The diagnosis can, of course, only be established by estimation of the blood sugar during an attack. In some cases in which a tumour of the pancreas has been found, its operative removal has been successful in controlling the attacks; in other cases some degree of control can be maintained by glucose feeding.

CHRONIC CONSTIPATION IN INFANCY AND CHILDHOOD.*

By ROBERT HUTCHISON, M.D., F.R.C.P.

LADIES AND GENTLEMEN,

I have been asked to lecture to you this morning on Chronic Constipation in Infancy and Childhood. I am afraid it is a dull subject, but there is no doubt that it is an important one in practice, because constipation is not by any means an uncommon trouble in childhood, as it is also in adult life, and it must be admitted that a certain number of cases of constipation in adult life have their origin in neglected constipation in childhood.

It will be convenient, for purposes of description, to speak separately of constipation in infants, and constipation in older children.

Taking infants first, you will remember that the normal infant has three or four stools in the 24 hours; but it would be a mistake to suppose, because a child has fewer motions than that, that it necessarily has constipation, provided always that the motions are normal in character and consistency. There are infants who have only one stool in 24 hours, and yet will be well and will gain weight. This fewness of motions—the consistency remaining normal—is particularly apt to occur in breast-fed children. You will see in books the statement that constipation is a vice of bottle-fed babies. I have not found that statement to be true; this particular scarcity of motions is particularly apt to occur in the breast-fed child. One reason for that probably is that breast milk is so easily digested and so completely absorbed that it leaves little residue; and where breast milk is not too abundant there may be so little intestinal residue left that one motion in the 24 hours is sufficient. Others of the cases, where the motions occur at too long intervals without being otherwise abnormal, are due, I think, to what you may speak of as a sluggishness of the rectal reflex; I think there is no doubt that some little babies have a “lazy

*A Post-Graduate Lecture delivered at the Hospital for Sick Children, Great Ormond Street, London, on October 30th, 1933.

rectum", that is to say, it requires a larger quantity of material in the rectum to stimulate an evacuation than should be the case. But these are not, in the strict meaning of the term, cases of constipation.

Now, true constipation, that is to say, where the motions are not only infrequent but too hard in consistence, departing from the 'yolk of egg' character of the healthy motion in the baby, and 'formed' like an adult motion, may be due to several causes. It is often said—and there is some truth in it—that *defective training* is a cause of constipation; if the child has not been properly educated up to regular evacuation of the bowels, constipation may result. It is easy to attach too much importance to this as a primary cause of constipation; it is more an aggravating condition in a child who is disposed to constipation than a cause of it in itself.

Second, and far more important, is *defective feeding*. This may take several forms and there may be several kinds of defect in the same child. I think that one of the commonest and one of the most likely to be overlooked, is simple under-feeding. Naturally, if a child does not get enough food there is very little residue, little to stimulate the bowel, and constipation is apt to result. This can be checked by the fact that not only is the child not gaining but is losing weight, or you can give test-meals, and weigh the child before and after.

The next form of wrong feeding is giving an *excess of casein* in the milk mixture. That is a fault which occurs in the bottle-fed baby, with the result that there are in the intestine tough undigested masses with which it has difficulty in dealing. Along with the excess of casein, or instead of it, there may be an *excess of fat*. This sometimes produces diarrhoea, sometimes constipation by the formation of soaps. You find in such a case a pale, solid, greasy-looking sort of stool, forming a large mass, which the bowel has difficulty in moving along. Thirdly, the diet may be deficient in water. I do not think the latter is a common cause of constipation in little babies, but it may be in an older child, particularly if it perspires freely.

The next cause of constipation in infancy is *atony* not only of the bowel but also of the abdominal wall. That is apt to occur in flabby, particularly rickety, children who have large abdomens, and difficulty in expelling the bowel contents.

Opposed to that is the reverse condition, *spastic constipation*, where the bowel is the seat of cramp, so that instead of peristalsis going along smoothly there are spasmodic contractions, and the contents are held up. That, of course, will be associated with colicky pain, and the accompanying screaming due to this is often a more prominent feature in the picture than the constipation itself. Possibly an excess of curd has caused the spasm.

There is no doubt, again, that *defective secretion* is sometimes a cause of constipation; I mean a defective secretion of bile and of intestinal juice. That is shown by a characteristic hard, dry and friable motion, usually pale, almost to chalkiness. It is not common, but when it occurs you should be able to recognise it.

Occasionally there are local causes in the rectum: I have already mentioned deficiency in the rectal reflex, but I am now referring to organic conditions such as anal fissure. In cases of apparent constipation I have sometimes found a small fissure in the anus which has made defæcation so painful that the motions are held back. Or, without actual fissure, there may be a very tight sphincter and anal canal. In some babies the anal canal is congenitally rather narrow, and that, of course, will oppose a mechanical obstacle to evacuation.

The final cause I shall mention in little babies is *mental defect*. Usually the constipation here is not the 'presenting symptom'; the child is brought because it is not "getting on" mentally. I have, however, known cases in which the child was brought because of constipation and the cause was mental defect which had not been recognised. That is particularly apt to occur in the milder degrees of cretinism. The importance of recognising these different causes is that effective treatment in any case will depend on the cause; there is no routine treatment. I would particularly deprecate the indiscriminate giving of aperients to an infant because it is believed to be constipated, without as far as possible determining the main causal factor.

Defective training is a matter for the nurse; the child must be put on the chamber at regular intervals; a child, even a very young one, quickly learns what is required of it, and it is astonishing what a difference a capable nurse will make in the training of these children.

In regard to feeding, you must first think of the possibility of under-feeding. If that is the cause of the constipation, the remedy is obvious: you must give more food. If the child is on the breast, it should have supplementary feeds; if it is bottle-fed, the strength or amount must be increased. If the trouble is due to excess of casein, you must take steps to prevent the formation of masses of curd. There are many ways of doing that. Greater dilution of the milk may suffice, or you may citrate the milk, or you may partially peptonise it. If the trouble is an excess of fat and formation of soaps, the amount of fat in the food is easily put right. Deficiency of water is overcome by giving drinks of water between feeds; indeed, it is good to do that always in the case of bottle-fed babies, certainly in hot weather, whether they are constipated or not.

Atonic constipation must be met by treatment of the underlying condition which is causing the atony. Often that is rickets. The latter is treated in the usual way by regulating the diet, giving fish oil of some kind, by attending to hygienic requirements, such as exercise, open air, sunlight, and massage of the abdomen, applied not only to the abdominal muscles, but deeply so as to benefit the bowel itself. It is a mistake to suppose you require the help of a skilled masseuse; any intelligent mother can be taught how to do it. This is carried out twice a day for a few minutes at a time.

Spastic cases are to be met by regulating the diet and by drugs. Make sure there is nothing in the diet which is setting up spasm—that it contains no undigested material. The most suitable drugs are tincture of belladonna and the ordinary carminatives. In these spastic cases anything like massage would do harm rather than good, as it would still further stimulate contraction of the bowel.

In the cases associated with defective secretion your aim must be to stimulate secretion, particularly of the bile and intestinal juices. The most suitable drugs for that purpose are grey powder and podophyllin; $\frac{1}{2}$ gr. of grey powder once or twice a day, or a drop of tincture of podophyllin three or four times a day.

For local causes the treatment is obvious. If there is fissure, it must be dealt with in the usual way; if the anal canal seems unduly tight, it must be stretched a little, under an anæsthetic.

In the mental defect cases the only special treatment is by thyroid; in mild cases of cretinism thyroid will often have an extraordinarily laxative effect.

I have spoken as if it were easy to arrive at the cause of constipation in a given case in infancy, but in practice you will not find it so. You will meet with a considerable number of cases in which you cannot be sure which, if any, of the causes I have mentioned, is at work. These may be spoken of as cases of *simple constipation*, with nothing else obviously wrong. In these cases it is always a good thing to introduce a more fermentable carbohydrate into the diet, such as malted foods (Mellin's food, for instance), or a little malt extract, or certain forms of sugar, especially the brown Demerara variety. Failing relief from that, you may have to give some aperient. But avoid the drastic ones. The least harmful is paraffin, which is preferably given in the form of emulsion. A teaspoonful of this given once or twice a day may be sufficient to act as a lubricant. If paraffin does not suffice, milk of magnesia is a popular and harmless aperient; it has the advantage that, introduced into the food, children take it readily. Another easily administered and successful laxative is phenol-phthalein, which can be given with a chocolate base and is almost tasteless. When the motions are very hard and are only passed after much straining, I like to use the confection of sulphur, either with or without the confection of senna. Children take it well, and the sulphur has the specific property of softening the motion, so that hard straining is obviated.

You may ask, What about the use of local means, treatment by enemata, or treatment of constipation by material administered by the rectum? I think rectal administration has its sphere in some cases. In those I have referred to as having a deficient rectal reflex, where the rectum needs a more powerful stimulus before it will expel its contents, I think the old-fashioned method of inserting an oiled paper cone is valuable and harmless as an educator of the reflex. Or you can use a plain small warm water enema. Otherwise local measures should be reserved for emergencies, for acute constipation, in cases in which the bowels have not acted for several days. In some cases of spastic constipation a warm enema, of water or oil, will give immediate relief of colic and will help to relax the spasm.

Turning now to constipation in older children I would first remind you not to refuse to diagnose constipation because the mother tells you the child has a daily action of the bowels; it is always possible that what comes away to-day ought to have been evacuated yesterday or the day before and that the whole intestinal movement is too slow. This may be spoken of as "masked constipation". The subjects of it are usually pale, lacking in appetite, with dark rings under their eyes, they are apt to have occasional attacks of fever with no obvious cause, and they may be subject to worms, especially threadworms. That type of child is not uncommon and always benefits from aperients, even though there seems to be a regular action of the bowels.

As to the causes of constipation in older children, there may here also be defective training, but in them training embraces more than in the infant. It means provision of suitable opportunities for the bowels to act. Late rising in the morning, hurrying over breakfast to get to school in time, and so on, leave no time for attention to the calls of Nature. In boarding schools I have known cases in which the trouble was due to lack of sufficient lavatory accommodation, a subject to which those who run those schools do not pay sufficient attention.

An increasingly important factor now-a-days is what is called negativism, a refusal by the child to allow the bowels to act for reasons largely psychological. It is very common in the solitary child of a family. This negativism may extend to the taking of food, and to sleep; there is a general refusal by these children to do

what is expected of them, and that may lead to extreme constipation. I remember one case so bad that the mother sent a telegram to the effect that her child's bowels had not acted for ten days, it being suggested that an operation for acute intestinal obstruction was necessary. I took the child to a nursing home, and from the moment of entering the home the bowels acted well. The removal of the child from its mother caused the negativism to disappear; she was an impossible sort of woman as a mother. These cases are getting increasingly frequent.

In these older children too, the diet may be wrong, but I do not believe that diet plays so important a part in constipation as is popularly supposed, and not many cases will be cured by attention to diet alone. There may be several dietary defects. There may be a deficiency of water in the diet, or a deficiency of so-called "roughage"; or on the other hand this coarse food may be in excess. A common fault now-a-days is excess of milk in the diet; for milk is a constipating food, largely because of its lime content. I always carefully enquire about the amount of milk taken, and often by cutting down the milk you can cause the constipation to disappear. Older children may have spastic constipation, showing itself, in them, in "umbilical colic," associated with irregular action of the bowel, constipation alternating with diarrhoea.

Lastly, I think there may be constipation as a result of excessive secretion of mucus in the bowel, in cases of what was formerly called "mucous disease". It is met with from the second dentition onwards. In those cases an excess of mucus seems to be produced in the bowel, comparable to, though in less degree than, that in muco-membranous colitis in grown-up people. The mucus, by coating the faecal contents, prevents the bowel getting a proper 'purchase' or grip on them for the purpose of moving them along; in other words, the contents are too slippery to be easily expelled.

And now as to the treatment of constipation in older children. Again it will depend on the cause in the particular child. For defective training the treatment is obvious. I would only emphasise once more the importance of providing the child with regular times and suitable opportunities for action of the bowel to take place. That may mean a re-arrangement of the whole life: it may mean getting up half an hour earlier in the morning than has been the custom, so that the child does not have to dash off to school after a hurried breakfast. The treatment of negativism is sometimes difficult so long as the child remains in its usual home surroundings: but the condition usually disappears as soon as the child is put into different surroundings. Your duty in cases of negativism is to treat the parent even more than the child. Hitherto the parents have been making a fuss about the action of the child's bowels, and the news has been eagerly awaited as to whether there has been an action or not. That is wrong: you need to inculcate into the parents an attitude of complete indifference: then, as soon as the child realises that nobody is interested as to whether it has an action of the bowels or not, matters will begin to improve. This education of the parents, however, is not always easy.

With regard to defective diet, the treatment is obvious. In some cases there may be a need to increase the quantity of food, whether you call it "roughage" or not. There is a popular belief that raw fruit is a good laxative: that, I think, is a mistake, but it is correct in regard to stewed fruit, especially apples and prunes; raw fruit often increases constipation. Give plenty of cooked fruit and vegetables, the latter preferably sieved. If there is an excess of milk, cut it down. If there is a deficiency of water, give drinks of water between meals.

Atonic constipation is to be managed in the older child as in the baby, but in the older child treatment is easier, as you have the child's co-operation. But, usually, these older children want more than exercise and massage to the abdomen, they need a complete change, such as being taken from school and put into a place where they will live an open-air life, so toning up the whole system.

In the cases showing spasm you must give a bland, unirritating diet, because it is sometimes an excess of "roughage" which sets up the spastic condition. These are the children who cannot deal with raw fruit, but they may be able to take cooked fruit and sieved vegetables. And in those, as in infant cases, you give belladonna and perhaps a mild laxative or lubricant, such as paraffin.

Where there is an excess of mucus the diet must be different: it is necessary then to reduce the starches and sugars, particularly cane sugar. To prevent the formation of mucus there is nothing better than the old rhubarb and soda mixture. In the older children, as in infants, you will meet with patients whom you will find it difficult to refer to any one of the categories I have named: cases in which there seems to be nothing definitely wrong with the diet; plenty of opportunity is given for the bowels to act and there is neither bowel spasm, nor excess of mucus in the motions. These you speak of again as simple constipation. Some have said these are due to the colon being abnormally long, and that as the child grows its length will become approximated to the normal. There may be something in that, but such an abnormality would be revealed by X-rays. And, whether there is a redundant colon or not, you must, just as in grown-up people, resort in such cases to aperients. Often parents are reluctant to give their child aperients regularly, but provided the laxative is properly chosen and is given in reasonable doses, no ultimate harm will result: on the contrary, by the proper use of laxatives you can educate the bowels to act regularly, and by and bye the dose can be diminished to a very small one, and finally can be dispensed with entirely. The most suitable aperients are the same as are used for grown-ups. Paraffin is a good lubricant, but usually in the cases I am referring to it is not sufficient. I prefer cascara or senna. Aloe is a good tonic aperient, but it is apt to gripe. I often give elixir of cascara, at bed-time, and children take it readily. Or you may give one of the forms of senna, either syrup of figs, or an infusion of senna pods. You proceed in the same way as for adults, finding the adequate dose and—an important matter—giving it regularly. There is an advantage in varying the kind of aperient: I like to ring the changes with one or two of the tonic laxatives, so as to avoid having to increase the dose.

CHRONIC EMPYEMATA.*

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Chronic empyemata may be either (1) PYOGENIC, or (2) TUBERCULOUS.

(1) **Pyogenic:** (a) *Those following the drainage of an acute empyema.* An acute empyema becomes chronic when the cavity persists for an abnormal length of time after the original drainage. It may either be draining more or less completely through the opening in the chest wall, or, the opening having been allowed to heal, pus has reaccumulated in the cavity.

*Post Graduate Lecture at the Brompton Hospital on 25th October, 1933.