

occasionally the heels. There may be several forms of rash, the commonest is an erythema. Less frequently there is a number of large dull red papules on the prominent parts; sometimes the surfaces of the papules are eroded giving an appearance like condylomata. In congenital syphilis, however, the papules appear more on the flexor aspect and not on the most prominent parts, the skin between the syphilitic papules is more normal, and there are usually characteristic lesions elsewhere, e.g., on the face, palms and soles. The treatment of napkin dermatitis is simple. Decomposition of the urine is prevented by dipping the washed napkins in a 1 in 5,000 solution of hydrarg. perchlor. before they are put to dry. Linimentum calamine is applied to the affected parts each time the napkin is changed.

Warts are more common in children than in adults. There is one type which is frequently diagnosed erroneously as a corn. This is the plantar wart which may appear either singly or in small groups at points of pressure on the foot. The lesion appears as a narrow ring of epidermis often differing slightly in colour from the rest of the horny layer enclosing an area of fissured epithelium which is extremely tender when pressed upon and which may make walking painful. When considering the treatment of warts the fact that they disappear spontaneously after a shorter or longer interval must not be forgotten, so any method which may leave unsightly scars on the face should be avoided. The pain arising from a plantar wart makes treatment imperative. The most satisfactory for this is an application of X-rays. After a suitable dose the pain disappears in a few days, although the lesion itself takes about a month to disappear. X-rays are also suitable for large isolated warts and for those involving the nail-fold and the nail-bed. In general practice some caustic application is the most convenient for ordinary warts. The most certain of these is trichloroacetic acid, although great care has to be taken to avoid any spread to adjacent normal skin. When plane warts are few in number they can be destroyed by the galvanocautery; when numerous it is better to apply a spirit lotion containing perchloride of mercury or resorcin. Several internal remedies have been suggested for warts but I have found none of them certain in action.

THE TREATMENT OF CHRONIC B. COLI INFECTIONS OF THE URINARY TRACT BY A KETOGENIC DIET.

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IN May of last year Professor Cabot was kind enough to give me particulars of the ketogenic diet, which as a result of the research work of Clarke and Helmholtz was in use at the Mayo Institute, for infections of the urinary tract by *B. coli*. I myself had for some months been making quite unsuccessful attempts to get rid of this particular infection, and I began the diet with hopes chastened by many previous failures. On the sixth day my urine was sterile: in the eight months which have elapsed since that date there has been no recurrence. My experience of the diet during that time has been confined to chronic cases, and in the main to adults. The results have been remarkable. I do not propose to record them here, because I believe it will be more helpful to dwell

on the small minority where the diet has failed, or where there has been a brief recurrence of the infection.

Infection of the urinary tract by *B. coli* is common, and in a substantial minority the infection becomes chronic. The record of that minority is a tale of urinary antiseptics tried in vain with the intervention of the surgeon and his wash-outs bringing no more success. Anyone who has been a victim of this infection will be familiar with the contrast between the optimism of the doctor and the pessimism of the patient. I write, of course, of chronic cases. It was not, therefore, surprising when word went round that such patients could be cured by dieting, that most people thought they had only to copy out Cabot's diet and all would be well. So far from this proving true, the history of the last eight months has driven home the lesson which the treatment of diabetes had already taught, namely, that the majority of men in general practice have not the time to supervise the dieting of patients where the diets involve weighing everything, calculating food values and changing the diets daily. In addition, in the use of the ketogenic diet, even if the practitioner is willing and able to supervise the diet, the limitations of the patient's cook may end in failure.

An abstract of a lecture published in the *Lancet* brought me a considerable correspondence from members of the profession, often themselves the patient, asking for guidance. I did my best, but, judging from subsequent letters, I was not very successful in helping my correspondents to carry out the diet. A fortnight after I had sent out three typed sheets of instruction, I would hear that the diet had not been successful, that there was not much in it, and more in a critical and reproachful strain. Addicted to understatement and sceptical by nature of miracles, I confess I was somewhat nettled by these effusions. And now instead of those three typed sheets which were the cause of all the bother, I write briefly that **the treatment is only suitable for an institution or nursing home.** In nine out of ten cases that is true. Perhaps it might even be carried further, for few general hospitals are in a position to give individual diets to their patients, to disguise the fat in the ketogenic diet so that it is palatable, or at any rate so that the patient will swallow it. I have no doubt that some hospitals have, and that more will shortly, overcome these difficulties. Meanwhile the patient on a ketogenic diet in the average institution is to be commiserated.

The problem of making the diet tolerable is largely a question of using the cream and butter in the cooking; they should not be served neat. The butter is perhaps the most difficult to conceal. If the vegetables are swimming in butter, or if a junk of butter is hidden underneath a lettuce leaf in a salad, the disguise has failed. It is most important that **the carbohydrates should not exceed twenty grammes.** In this connection a useful suggestion has been made by Dr. Fuller in a letter to the *Lancet*, that if a synthetic cream prepared from butter so that it contains no lactose is used, the carbohydrates can be diminished still further without any sense of deprivation. But synthetic cream is not nearly so palatable as ordinary cream used in cooking, for example, as in soup. I ought to say here that where the dieting is under daily competent supervision it is never so unpalatable as to imperil the success of the treatment. I record this because it has been assumed in recent communications that this is a legitimate reason for the failure of the treatment.

Quite apart from the necessity of making this diet palatable, of accurately weighing the ingredients of the diet, and of adhering strictly to the prescribed diet, there are failures for which we cannot be held responsible.

The pH of the urine may never fall to the required figures. The patient may swallow the prescribed amount of fat and much more, he may never exceed the twenty grammes of carbohydrates and yet the pH may remain nearer 6 than 5. It is not, I think, a common cause of failure. What is common is to find an initial fall to 5.0 or to 5.2, followed by a secondary rise some days later to 5.4 or 5.6. This secondary rise may even imperil the success of the treatment. In a woman admitted to a home on December 6, the pH fell to 5.1, but rose on the third day to 5.6 and varied between 5.6 and 5.7 until December 12, when the urine was found sterile. Here an intense ketosis apparently saved the situation. As the pH remained high, on December 15 I gave her ammonium nitrate, six grammes daily in pills. This brought down the pH to 5.2, but the ketosis as judged by the Rothera and ferric chloride tests became less intense. On December 19, *B. coli* were again found in the urine. This quick reappearance of *B. coli* in the urine when the conditions inhibiting the growth of *B. coli* are not maintained (in this instance an intense ketosis) was the first intimation I received of the necessity of preserving such conditions for at least a week after the urine is sterile. In this case the diet was not altered and the pH fell from 5.6 to 5.2, but the ketosis diminished.

A much more common cause of failure is when no ketosis develops. If the ferric chloride test is not strongly positive within a few days I have learnt to be very anxious about the success of the treatment in that particular patient. If there is an intense ketosis I feel quite happy about things. Clarke, in his original paper, had noted the absence of ketosis as one of the causes of failure. But I had not grasped from his paper its primary importance. In the case of a doctor the pH remained steady at 5 for a week and for the next three weeks never exceeded 5.2, but there was practically no ketosis throughout and the bacteriological reports were at no time encouraging. If an evening specimen only is examined the result may be deceptive. For example, in another patient there was an intense ketosis at 8 p.m. (Rothera + + + +, ferric chloride + + +) : the same result at 10 p.m. : at midnight a slightly less pronounced ferric chloride, but at 4 a.m. this test was negative and the Rothera test + : at 8 a.m. both tests were negative. For a week tests were made at these hours with the same results. Fat given as cream during the night appeared to provide us with a partial remedy for the disappearance of the ketosis in the morning hours.

Eight months, the time that has elapsed since I began to use the ketogenic diet, is too short a period to allow one to speak dogmatically about the liability to relapses. It seems, however, to be probable, if we may draw conclusions from a few cases in which this happened, that if the diet is relaxed within a week after the urine has been pronounced sterile, the *B. coli* reappear in a few days. I first noticed this in a doctor who was taken off the diet the day after he became sterile for reasons unconnected with the treatment. Incidentally, this patient's pH was as low as 5.2 twice, and at other times was 5.4 or higher, yet he became sterile.

In a woman who had had the infection for eighteen years a severe attack of influenza four months after the urine became sterile was associated with a recurrence of the *B. coli* infection. The urine again became sterile on the third day of a second resort to the fat diet. Another patient relapsed two months after the urine had been found sterile ; she rapidly responded to the ketogenic diet. Only one other case relapsed ; a pregnant woman who, forsaking the diet three days after a sterile report, had a recurrence one

month later. As in all our relapses the ketogenic diet was more rapidly effective in this recurrence than it had been when first used. A healthy baby was eventually born.

In a treatment so dramatically successful in the vast majority of chronic cases which have defied all other measures it is a useful discipline to enlarge on the few cases that have failed to respond to the treatment, or having become sterile, relapsed. The moral of these failures appears to be that however perfect the conditions, however careful the dieting, a small minority will not respond to the treatment. Set out as in this paper the difficulties encountered may perhaps get out of focus. Actually in only three patients has there been failure to obtain a sterile urine. In two of these the failure was apparently due to the absence of ketosis; one patient, a doctor, was dieted at home where I had no control over the diet except that furnished by the pH of the urine: in the third the pH was always high and in addition the ketosis was never satisfactory being absent for part of each day. As far as relapses are concerned, in three patients there was a recurrence of the *B. coli* one to four months after the urine had been found sterile. All rapidly became sterile again on renewing the dieting. In two cases there was a recurrence of the *B. coli* within a week after a sterile report had been received: in one due to abandoning the diet forthwith; in the other apparently due to a decline in the ketosis in the second week perhaps associated with the administration of ammonium nitrate. If the treatment is going to be successful we are not left long in suspense. The majority of patients have reports of sterile urine in from one to two weeks after treatment is begun. A week's treatment after the urine is pronounced sterile is sufficient to insure against relapses. The treatment should if possible be carried out in an institution or nursing home: if the former it is well to be satisfied that sufficient attention can be paid to making the diet tolerable. If the pH is not estimated one is entirely in the dark as to what is happening though the disappearance of symptoms is suggestive. Under such circumstances the patient may be dieted for three weeks without the conditions essential to inhibiting the growth of *B. coli* being once present. However skilful the conduct of the treatment the diet remains disagreeable to the majority, and it is necessary to be able, from knowledge of the pH and of the ketosis, to reassure the patient with the heartening counsel that patience for a few more days will almost certainly result in a sterile urine.

There are not many chronic infections for which we can promise a considerable measure of relief: there are still fewer in which we can say that the infection will be extirpated in the majority of patients within three weeks. But the ketogenic diet will fall into disrepute unless those who use it know what they are doing.

THE USES AND INDICATIONS FOR INTRAVENOUS AND RECTAL ANÆSTHETICS.

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UNDOUBTEDLY the greatest use of these types of anæsthesia are for the very nervous and thyroid cases. They also have the following advantages: (1) Less vomiting. (2) Less after pain. (3) Diminution in the amount of general anæsthetic required to supplement them. (4) Less risk of chest complications developing where the basal anæsthetic is not eliminated by the lungs.