

ORIGINAL PAPERS.

THE DIETARY OF THE CONSUMPTIVE.

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ONE of the problems which the sanatorium physician finds most difficult is that of diet. Given an early case of tuberculosis with no marked gastric derangement, the patient usually reacts quickly to the treatment, appetite and digestion improve, and the problem is merely to supply the various nutrient constituents in the proportion best calculated to sustain nutrition and give a sufficiently high caloric value to ensure his having a margin on which to gain weight.

Unfortunately, many tuberculous cases admitted to a sanatorium for treatment do not thus early react. Roughly speaking, the cases which do not react fail to do so for one of two reasons: Either the toxic poisoning caused by the disease is so acute that it prevents improvement taking place in the appetite and digestion; or the patient has been long ill and suffers from a dyspepsia, associated with actual pathological changes in the gastro-intestinal mucosa.

Cases with an acute toxæmia and consequent gastro-intestinal derangement usually, if not invariably, have a swinging or elevated temperature. In dieting a febrile case of tuberculosis, it must be borne in mind that the febrile tuberculous patient must not be dieted on the same lines as a patient suffering from an acute febrile disease with a corresponding degree of pyrexia. With the poor control characteristic of the condition, the temperature disturbance is out of proportion to the severity of the symptoms. Thus, a case of tuberculosis with an elevated temperature of 102° to 103° F. may be able to take a full diet and gain weight, with no gastro-intestinal difficulty. In such cases the temperature usually declines and the patient improves. On the other hand, there are cases in which the toxic poisoning seems particularly to affect the appetite and digestion, and these are the cases in which the dieting presents difficulties.

In the group of cases with a chronic dyspepsia, the disease itself is usually subacute or chronic, and the patient gives a history of old-standing dyspeptic troubles long before the onset of lung symptoms.

Cases vary considerably as to the seat of the dyspepsia. Certain cases, especially of the toxic variety, suffer chiefly from gastric symptoms: want of appetite, sickness, and vomiting; others, again, show symptoms pointing to intestinal dyspepsia: relatively high morning temperature, excess of indican in the urine and intestinal flatulence, often with a sense of depression and headache.

In order to successfully diet cases of tuberculosis, it is necessary to know what is the condition of the various digestive secretions. I have found in a considerable number of cases, many of them not showing any special symptoms of dyspepsia, that the characteristic gastric secretion in tuberculous patients is one deficient in hydrochloric acid.¹ In many cases there is little combined acid after a test meal, and only very rarely any free acid—hyperchlorhydria I have never seen, though there is generally a considerable quantity of organic acidity. Hydrochloric acid is the specific stimulant of pancreatic activity, so that probably the pancreatic secretion is also diminished. The scarcity of acid allows gastric fermentation to take place, and consequent flatulence. The aim of dieting should be to counteract the pathological condition of the secretions.

Pawlow² has shown that gastric secretion is stimulated by appetizing food, so that the dietary should be varied to stimulate the appetite, and good cooking is of the utmost importance. He has also demonstrated that dieting tends to alter the secretions, so that, for a given food, the glands gradually come to secrete the juices which are best adapted for its digestion.

As we know that the gastric secretion in consumption is usually deficient in mineral acid and digestive power, the diet selected for these cases should be such that the proteid constituents are in a form specially adapted to stimulate secretion, and at the same time easily digestible. Pawlow's experiments³ on the dog show that raw meat causes the secretion of a juice strong in mineral acid, the summit of the secretory curve being quickly attained. I have found that after a raw-meat test meal the stomach quickly empties itself, so that by the end of an hour it may be impossible to recover anything from the patient's stomach by the aid of the tube. Raw meat furnishes a means of artificially stimulating the secretion of a highly acid, and therefore antiseptic, juice, which further stimulates pancreatic digestion on passing into the duodenum.

In certain cases in which the gastric symptoms are such as to prevent the patient retaining the requisite quantity of food, it is important to keep up the nitrogen intake, and at the same time to throw as little

¹ This was the case in many of the patients of Dr. R. W. Philip examined by me in the Royal Victoria Hospital, Edinburgh.

² Pawlow, J. P.: "The Work of the Digestive Glands." English Edition. London: Charles Griffin and Co. 1902. P. 69 *et seq.*

³ *Ibid.*, p. 36 *et seq.*

strain on digestion as possible, apart altogether from specific dieting to vary secretion activity. This may be attained by giving raw eggs. Raw eggs do not stimulate gastric secretion, and if given on an empty stomach they pass through rapidly with no digestion. If given with milk or other food, they remain in the stomach till the milk is thoroughly digested and ready to pass into the duodenum. The eggs, to secure the best results, must be new laid, given plain, and a reasonable time allowed to elapse before the next meal.

In the group of cases which shows evidence of intestinal decomposition the conditions are more difficult of investigation. Probably the pancreatic secretion is defective secondarily to the deficiency of stimulating acid, resulting in the slow digestion and consequent decomposition of the proteid. Diminishing the proteid lessens the chance of fermentation, but does nothing to correct the primary secretory error, and interferes with the proper dieting of the patient, from the wider point of view. This type of case usually shows a supranormal temperature often inverted, headaches, and other symptoms of toxic poisoning, with an excess of indican in the urine. In such cases I find that Metchnikoff's milk is useful in preventing fermentation. I am indebted to Dr. Isabella Mears, of Woodburn Sanatorium, Edinburgh, for the following method of using the milk. In such cases, especially when there is an exacerbation of the symptoms with pyrexia, the milk is inoculated as directed by the makers, incubated for two hours before administration, and neutralized with a pinch of chalk. It is given two-hourly, with no other food for two days, so as thoroughly to flood the intestines with the *Bacillus lactis*. The ordinary diet may then be reverted to, with prepared milk instead of fresh milk. The result is a surprisingly rapid fall in the temperature and disappearance of the toxic symptoms. The effect is more complete than can, in my experience, be got with any intestinal antiseptic, and the permanent dietetic treatment of the patient is not interfered with.

Given a case of tuberculosis with no gastro-intestinal disorder, the aim in dieting is to induce the patient to put on flesh rather than fat. Fat may be converted into muscle by exercise, but the patient may not be able to take the necessary amount. The diet must be of sufficient caloric value for the needs of the patient, and must contain sufficient proteid to make nitrogen fixation possible. The ideal is to secure an increase of the protoplasm or vitalized proteid, rather than of the paraplasm or circulating proteid, which is merely a stored nitrogenous fuel and of relatively low caloric value. Here, again, we are helped by raw meat, which is a direct stimulant to nitrogen fixation. The same end cannot be gained by stuffing with cooked proteid, or decreasing nitrogen decomposition by raising the caloric value of the diet with fats and carbohydrates.

Except in the special gastric conditions which are indicated below, I believe in giving three meals a day with no food between, thus ensuring that the glands shall have a reasonable time to rest and secrete, and that a fresh meal is not put into a stomach containing the fermenting remains of the last meal. The dietary which I find gives the most physiological results is one of 2,600 to 2,800 calories. I find that it is impossible to ascertain the heat value of a mixed diet in which the patient is allowed a choice, because of the varying composition of cooked foods, the composition of no two milk or steamed puddings being alike, and their concentration continually varying. Raw meat I use in the great majority of cases, and as a rule find no difficulty in its administration.

The diet given below is the prescribed minimum, but I find that patients usually take more :

Breakfast, 8.30.—Two courses: fish, bacon and eggs, eggs or cold meat, 1 pint milk, bread and butter (porridge, tea and coffee optional).

Dinner, 1.—Soup (optional); two courses: raw meat and choice of roast joint or other cooked meat dish; vegetables; puddings, steamed or milk; bread, butter, 1 pint milk; cheese (optional).

Supper, 7.—Fish; two courses: raw meat, joint, etc.; puddings, steamed or milk; cheese and coffee (optional).

The approximate total diet may be stated thus :

Flesh Food: Meat, chicken, eggs, fish, etc., 360 grammes.

Milk: 1,500 c.c.

Carbohydrates: Porridge, puddings, bread, 360 grammes.

Fat: Butter, exclusive of that used in cooking, 50 grammes.

Raw meat may be given in various ways. It is freed from fat, very finely minced, and seasoned with pepper and salt. It may be made into soup by making a fine paste with stock and diluting with warm stock under 100° F. to the consistency of gruel, and flavouring with tomato sauce or otherwise.

Raw meat may also be made into a cream with malted milk.

Beef-juice has been shown by Richet to contain all the curative principles, and is prepared by dissolving out the soluble meat albumins with saline solution (1 pint to the pound) and straining in a press.

Juice can be made into a very palatable jelly by adding to a very stiff gelatine solution cold, just as the latter is about to set, so as to bring the whole to the proper consistency for setting. It may be flavoured with sherry or any suitable essence.¹

In cases with flatulence and sickness I am in the habit of sterilizing the stomach by giving hot water to sip before meals to wash out the infected mucous. An hour after I give a small meal of raw meat and

¹ For several of the above recipes I am indebted to Dr. Mears, of Woodburn Sanatorium, Edinburgh.

hot water with dry toast, which is practically unfermentable, and at the same time stimulates the secretion of the natural antiseptics. As the condition improves, after a day or two, milk may be given shortly after the meal. Milk has been shown to inhibit gastric secretion, and so in difficult cases may be given between meals—that is, long enough after the meal to allow the summit of the secretory curve to pass, so that the inhibition of secretion and the dilution do not have much effect, as the acid has already combined with the food proteid. As the sickness and flatulence diminish, the ordinary dietary can be resumed cautiously, and I have found that an occasional meal of raw meat alone greatly helps to keep the stomach sterile, once a certain amount of secretory activity has been established. Any article of diet which the patient cannot take can be gradually introduced into the dietary, the secreting mechanism being educated to deal with it.

In tuberculous children beef-juice, plain or mixed with milk, is well borne, also small quantities of raw meat. The diet should be of a caloric value proportional to the body-weight, with rather less proteid than ordinary.

I have never seen a case in which albuminuria has started after raw meat, though when albumin is already present it increases the amount, but, so far as I have seen, has no special influence on the case otherwise.

Tapeworm, if the meat is carefully selected, is rare. I have only seen one case in the past two years, in a patient who had had one before he ever had raw meat.

The results in difficult cases differ from those got with ordinary cooked diet. Patients are firmer, not so fat and breathless, and the proportion of cases who improve constitutionally, but whose physical signs do not improve, is less than on ordinary diet.

NOTE.—For further particulars regarding the clinical use and metabolism of raw meat see the following :

Hericourt and Richet : *Compt. Rend. de l'Acad. des Sciences*, 1900, p. 605.

Richet : *Revue de Médecine*, Février and Août, 1905.

Philip, R. W. : *Practitioner*, January, 1905 ; Transactions of Tuberculosis Congress, Paris, 1905, vol. i., p. 669.

Galbraith, J. J. : *Practitioner*, February, 1905 ; Transactions of Tuberculosis Congress, Paris, 1905, vol. i., p. 664.

Mears, I. : *Practitioner*, July, 1905.