A SIMPLIFIED METHOD OF INVESTIGATING STEATORRHOEA

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For years, the five- or ten-day fat-balance study has been considered the only sure way to determine the presence of steatorrhoea. Owing to the shortage of trained nursing staff and diet kitchens in many hospitals, this method of investigation is open to many inaccuracies. To physicians, the method has seemed impracticable and time-consuming, and pathologists have not welcomed the laborious analyses of fat in dried faeces. Anderson, Frazer, French, Gerrard, Sammons, and Smellie (1952) have for some years used a quicker method of fat analysis based on the principles of homogenizing the wet faeces and estimating the total fatty acid content of a sample by the method of van de Kamer, ten Bokkel Huinink, and Weijers (1949). This technique has been used here, and, following the work of Annegers, our patients have not been on a weighed intake of fat but on normal ward diet. Annegers, Boutwell, and Ivy (1948) carried out investigations on 40 normals who were given standard amounts of fat in their diet of two types, namely, lard and homogenized vegetable oil. Specimens were collected for five-day periods and the fat content determined. Their conclusions were that fat balance "digestibility" studies are of questionable validity, since within ordinary dietary limits faecal fat excretion is, in their experience, independent of dietary intake.

Procedure

The basic simplifications of our method are: (1) Patients are on the usual ward diet. (2) The total fat excretion over only three consecutive days is measured. (If the scatter of observations is great a further three days' samples are obtained.)

In the ward the patient's 24-hour output of faeces is collected in a container which is then sealed, labelled, dated, and despatched to the laboratory, and this procedure is repeated for two successive days. If, for a day, the patient is constipated, the collections are continued until four days of output have been completed. The results are expressed as a mean 24-hourly fat excretion over a given period, usually three days, or as a mean three-day fat excretion calculated as fatty acid according to Goiffon (1942).

Method

The specimen is then homogenized according to the method of Anderson et al. (1952). The whole of the 24-hour specimen is placed in an "ato-mix" mixing machine (graduated at 900 ml). Distilled water is added until the consistency allows the machine to run at half-speed in order to remove air. It is allowed to run until the air is removed, and then the volume made up to 900 ml. The machine is then allowed to run at full-speed for one minute. The mixed faeces are allowed to stand for a few minutes so that the small air bubbles may rise to the top. The fat content of a sample of this is estimated by van Kamer's method.

Results

Investigations were performed on 11 normal cases and on 11 cases of mild steatorrhoea developing after the Polya type of gastrectomy. The results are shown in Figs. 1 and 2.

Fig. 1.—Mean three-day fat excretion 11.72 ± 3.17 g. of fat (as fatty acid) in normals. Mean daily fat excretion 3.91 ± 2.45 g. of fat (as fatty acid) in normals.

It will be seen that normal people excrete less than 5 g. of fat per day over a three-day period, and the scatter of daily values is much less than in
Fig. 2.—Mean three-day fat excretion
8.7±11.4 g. of fat (as fatty acid) in cases of steatorrhoea. Mean daily fat excretion
10.29±4.49 g. of fat (as fatty acid) in cases of steatorrhoea.

those with steatorrhoea. If we assume that 100 g. of fat per day is as much or more than is contained in the normal ward diet, then an excretion of 5 g. of fat per day corresponds to 95% absorption, the usually accepted lower level of normal absorption. Thus 5 g. of fat per day can safely be accepted as the upper limit of the normal range of excretion. Using these criteria and this method it will be seen from the charts that the distinction between controls and cases of steatorrhoea is quite clear cut. It is a method where any error due to variations in fat intake would tend to "iron out" differences between the normal and abnormal groups, so the clear-cut distinction between the two groups is all the more significant.

Summary

A simplified method, which is useful in cases of steatorrhoea and where there is no necessity to use a balanced fat diet, is described.

References