
ORIGINAL ARTICLE

Floating Test (Rossipal) for Screening Patients with Fat Malabsorption

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Abstract

Floating test for fat malabsorption as outlined by Rossipal et al has been done in 20 malnourished infants and in 25 infants suffering from minor illnesses who served as control.

Concomittant lipiodol absorption tests were also performed in the malnourished group.

Floating test seemed to be of use as screening test to establish the presence or absence of a definite steatorrhoea, but failed to determine the variations of abnormal fat absorption.

It can be used as an alternate to lipiodol absorption test where lipiodol is not available or difficult to obtain.

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Introduction

An investigation for fat in the stool can be done by microscopic examination of the stool. For this test to be significant, fat globules should be present in large numbers. For the detection of a mild form of fat malabsorption, a very reliable method is the quantitative determination of fat excretion in the stool (Van de Kamer et al., 1949) of which fatty acids are determined. For adequate assessment, stool collection for at least 3 days are however required; the samples have to be thoroughly homogenized before further laboratory procedures can be done, making this test too laborate, time consuming and technically difficult.

To avoid the disadvantage of prolonged stool collection and the unwillingness of many laboratory assistants in doing such a procedure, more simple and practical test have been devised.

The use of lipiodol as a test substance with measurement of the iodine appearing in the urine has been reported by Silverman and Shirben (1955) and further by Jones and Agnese (1963).

Gracey from Australia and Suharjo from Indonesia in a collaborative work confirmed the lipiodol absorption test as a fairly reliable index of intestinal malabsorption of fat.

The lipiodol absorption test was found to be practical enough for outpatient use and simple enough to permit widespread application with minimum laboratory equipments (Jones, 1963; Gracey, 1974).

In 1976 another simple and rapid method for the diagnosis of steatorrhoea was proposed by Rossipal et al. (for simplicity we call this test as the floatingtest). The test is based on the assessment of the difference of specific gravity and lipophilic property between a normal stool and that in steatorrhoea using a Benzene Na Br system.

The present study try to investigate the feasibility of doing the floating test in Indonesian infants and compared the results with the lipiodol absorption tests.

Infants with minor illnesses were included for control.

Material and Methods

20 malnourished infants aged between 2 and 8 months and 25 infants aged between 5 - 18 months with minor illnesses were subjected to investigations.

Both lipiodol and floating tests were performed in the malnourished group, while group with only minor illnessess underwent only the floating test.

The lipiodol absorption tests were performed as outlined by Gracey et al. (1976) with a slight modification.

The floating tests were done according to the procedures described by Rossipal et al., in 1976.

At least a walnut stool sample was spread on the inner wall of a beaker.

The beaker with a 1 - 2 mm stool film was then placed in an incubator at 80° C for at least 6 hours. The hardened

dried film was then scraped from the beaker and pulverized very finely in a porcelain dish.

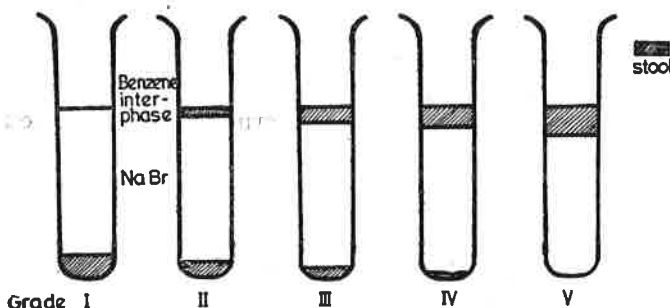
Approximately 5 ml of an aqueous Na Br solution and 2 ml of benzene were introduced into a normal centrifuge tube.

Then 25 mg of stool was sprinkled into the centrifuge glass and centrifuged for 5 minutes.

Following centrifugation one of the five possible results may be obtained:

1. The entire stool specimen transversed the centrifuge tube and formed a layer on the bottom in the Na Br phase only a thin pale film remained on the interphase (Grade 1).
2. A small portion of the stool remained on the interphase, while a larger portion transversed and formed a layer on the bottom in the Na Br phase (Grade 2).
3. Equal portion of stool specimen either forming a layer on the bottom or remained in the interphase (Grade 3)
4. A larger portion of the stool remained on the interphase, while only a smaller portion transversed and formed a layer on the bottom (Grade 4).
5. The entire stool specimen remained on the benzene Na Br interphase (Grade 5). See figure 1.

FIG. 1: Five possibilities of the floating test graduations



Results

None of the malnourished infants were classified into Grade 1 floating test, while 14 out of 25 (56%) "normal" infants showed Grade 1 floating test.

Grade 2 floating tests were found in 7 malnourished infants and in 5 of the "normal" infants.

Grade 3 floating test were found in 3 malnourished infants and 6 of the "normal" infants.

Grade 4 and 5 were found respectively in 3 and 7 of the malnourished infants, and none in the "normal" group.

Correlating the floating tests with lipidol absorption tests, the following results were obtained:

Of the 7 malnourished infants classified of having fat malabsorption of Grade 2, two showed suspected, two mild, and 3 moderate fat malabsorption as judged by lipiodol absorption test.

Out of the 3 patients classified as Grade 3 floating test, 2 of them belonged to mild and 1 to the moderate form of fat malabsorption determined by the lipiodol absorption test.

All the 10 patients belonging to the severe fat malabsorption as judged by

the lipiodol absorption test have either Grade 4 or 5 floating test (see Table 2).

No obvious correlation were however found between the severity of malnutrition and fat malabsorption determined by both tests.

There were also no correlations between the presence of fat globulin seen microscopically with both lipiodol and floating tests.

TABLE 1: Floating tests and lipiodol absorption tests in malnourished infants

Floating test.	Lipiodol tests.				
	Normal	Susp.	Mild	Moderate	Severe
Grade 1	—	—	—	—	—
Grade 2	—	2	2	3	—
Grade 3	—	—	2	1	—
Grade 4	—	—	—	—	3
Grade 5	—	—	—	—	7

Fig. 2: Floating tests and lipiodol absorption tests in malnourished infants

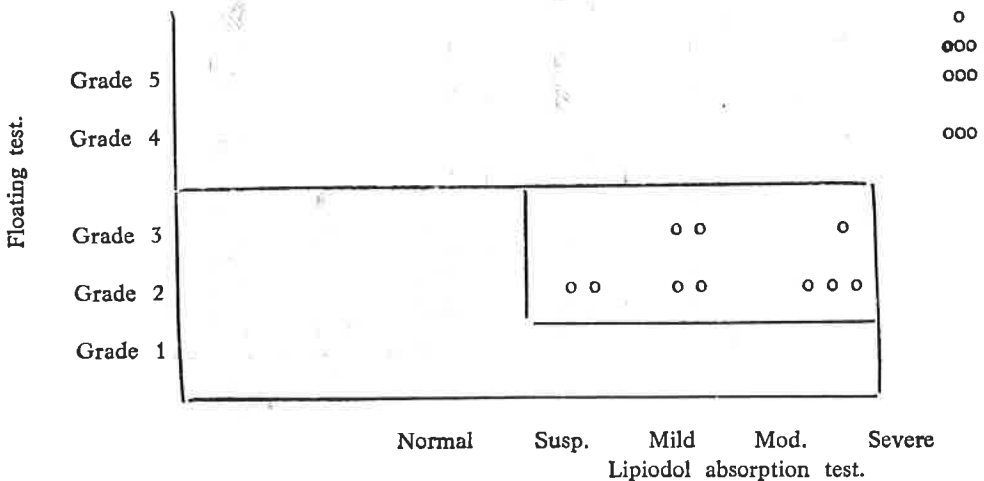
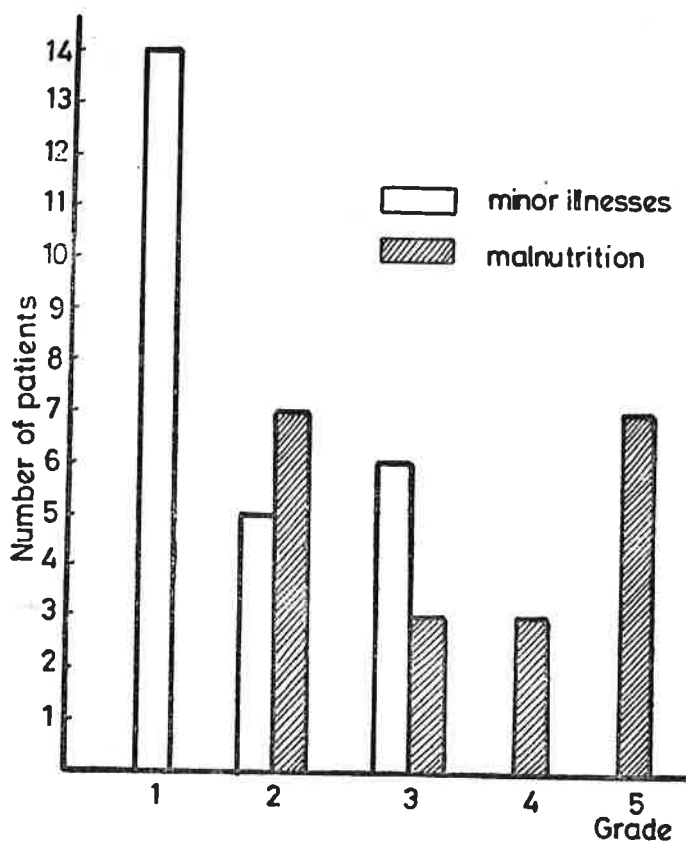


TABLE 2: *Floating tests in infants with minor illnesses*

Grade 1	14 (56%)
Grade 2	5 (20%)
Grade 3	6 (24%)
Grade 4	—
Grade 5	—

Total 25

FIG. 5: *Floating tests in malnourished infants and infants with minor illnesses*

It is obvious from figure 3 that grade 2 and grade 3 occurred both in "normal" and malnourished infants. and grade 4 and 5 floating test with the severe form of lipiodol absorption tests.

Discussion

The exact incidences of fat malabsorption in infants and children in most areas in Indonesia are difficult to establish.

This is partly due to the fact that the most reliable method of assessment of fat malabsorption, the quantitative faecal fat excretion study (Van de Kamer et al., 1949) is not readily available in most hospitals in Indonesia.

The lipiodol absorption test is confirmed to be of a simple and fairly reliable index of intestinal malabsorption of fat and is found to be practical enough for outpatient use (Jones and Agnese, 1963; Gracey, 1974). However lipiodol oil is not always available in most part of Indonesia and is also relatively expensive.

"Floating test" seen to be a more simple and rapid method for the diagnosis of steatorrhoea. As a screening test this method is said to be accurate enough in diagnosing fat malabsorption.

It is apparent from this study that there are quite a good correlations between grade 1 classified by floating test with "normal" classified by lipiodol test,

Discrepancies however existed if one compares grade 2, 3, 4 floating tests respectively with suspected, mild and moderate form of fat malabsorption classified by lipiodol absorption tests (see figure 2).

Overlapping again occurred in grade 2 and 3 between "normal" and malnourished infants tested with floating tests (see figure 3).

It is thus obvious from this study that the floating test seemed to be not of a good index for differentiating between suspected, mild, and moderate cases of fat malabsorption.

It would be only useful in screening tests to establish the presence or absence of a definite steatorrhoea, but seemed not to be of a good index for determining the variation of abnormal fat absorption.

Steatorrhoea could be suspected only if the patient shows a grade 4 or 5 results with floating test.

A fat content of 20% or more of the dried stool or 3.1 grams fat excretion in 24 hours will correspond to grade 5 floating test.

Floating test method can be used as an alternate to the lipiodol absorption test especially where lipiodol is not available or difficult to obtain.

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