A SIMPLE TEST FOR THE DETECTION OF OESOPHAGEAL REFUX*

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OESOPHAGEAL aspiration, followed by chemical analysis of the aspirate, has been used in some centres for the detection of gastro-oesophageal reflux. In this test, the detection of reflux has been rendered easy and simple by the introduction into the stomach of methylene blue† as an indicator dye.

Procedure

On a fasting stomach, 4 c.c. of 5% methylene blue is introduced via a rigid naso-gastric tube, which is then removed and the patient is given two tumblers of water to drink. A second tube is then passed down the oesophagus for a distance of 30-35 c.m. from the incisors, so that the tip lies above the gastro-oesophageal junction. The tube is then fixed in that position. Introduction of a second tube was found necessary in order to avoid misinterpretation due to staining of the first tube. The patient is made to lie semi-prone on the right side with the left knee flexed and a pillow is placed beneath the abdomen. The tube is then connected to the sucker with a collecting bottle intervening. While suction is maintained, at 5 mm. mercury, every effort is made to enhance reflux. The patient is asked to swallow and then take a deep inspiration. Deep inspiration increases the gastro-oesophageal gradient and thus enhances reflux. During deep inspiration this gradient may reach up to 15 mm. mercury. Descent of the diaphragm pushes the fundus of the stomach downwards. This widens the gastro-oesophageal angle and if a sliding hernia is present it may be pushed up into the chest. These two factors annihilate the valvular mechanism of the cardia and facilitate reflux. The patient may also be asked to strain or cough. These actions raise the intra-abdominal pressure whilst the diaphragm is fully relaxed and this annuls any stop-cock action of the right crus‡ of the diaphragm.

Manoeuvres such as manual compression of the abdomen, or elevation of the foot of the couch may be tried. If no reflux is evident after 10 minutes the patient is asked to stoop and the manoeuvres are repeated while suction is continued.

Patency of the tube may be ascertained by giving the patient a sip of

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†Methylene blue is a non-toxic dye. It can be administered orally or intravenously and is used for the treatment of met-haemoglobinaemia because of its reducing properties. It is also a mild urinary anti-septic.

‡It is debatable whether the right crus plays a role in the prevention of reflux, but it certainly is a major factor in preventing the fundus of the stomach from ascending into the chest.
water to drink. If occluded, the tube can be cleared by injecting 5 c.c. of water into it. Of the manoeuvres used, swallowing and deep breathing were found most effective in obtaining an aspirate, whether it be swallowed saliva, or regurgitated gastric contents. This is, perhaps, because these manoeuvres, in addition to promoting reflux, also help to disengage the mucosa from the perforations at the tip of the tube. After a specimen of oesophageal aspirate is taken, the tube is pushed further down into the stomach and the gastric contents aspirated. The colour of oesophageal and gastric aspirates is then compared. In order to obtain comparative data between this method and the chemical method, we analysed the specimens for acidity, pepsin content and amylase activity.

Some difficulties were encountered, especially during the earlier tests. The main difficulties were:

Some irritable patients who were inclined to retch or vomit. In these cases the test had to be repeated on another occasion.

In a case with advanced stricture, due to reflux, a negative result was obtained. In such cases positive results may be obtained if aspiration is continued over a longer period of time.

Discussion

The introduction of methylene blue into the stomach facilitates the detection of even small amounts of reflux and allows easy and immediate differentiation between gastric contents and swallowed saliva, without having to resort to elaborate biochemical analyses, the results of which may be difficult to interpret and quite often inconclusive, due to the following facts:

Absence of free hydrochloric acid from the oesophageal aspirate cannot be taken as conclusive evidence of absence of reflux, even if histamine was administered. It is well known that 1–2% of normal individuals have histamine fast achlorhydria. When hydrochloric acid is present it is continuously neutralised by salivary and gastric mucin, as well as by regurgitated duodenal contents.

Presence of pepsin in the oesophageal aspirate can be taken as evidence of the presence of oesophageal reflux, but its absence does not conclusively exclude it. Pepsin, like hydrochloric acid, is inhibited by mucin.

The test has two advantages over oesophagoscopy:

Filling the stomach with water prior to aspiration facilitates reflux which might otherwise be missed if the stomach were empty, as is usually the case during oesophagoscopy.

The presence of the naso-gastric tube well above the cardia, eliminates any interference with the valvular mechanism, which cannot be avoided in oesophagoscopy.

The main advantage over radiological examination is that the test can be performed on more than one occasion without the risks entailed in repeated radiological examination.

It is known that a single negative examination cannot be taken as conclusive evidence of absence of reflux.

Results

This test was performed on 40 occasions at Merlin Park Hospital, Galway and the results were compared with those obtained by biochemical studies,