

## Oesophageal dilatation in Parkinson's disease

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**SYNOPSIS** In an unselected group of 37 patients with Parkinsonism the mean diameter of the oesophagus at the level of the 9th dorsal vertebra was 3.11 cm, which was significantly higher than the mean of 2.24 cm in a group of control patients. Six of the patients with Parkinsonism had gross oesophageal dilatation.

Symptoms and signs of disturbance in the upper alimentary system have been described in Parkinsonism (Eadie and Tyrer, 1965a; Calne *et al.*, 1970). The drooling of saliva commonly noted is probably due to disturbance of several functions including production of saliva, chewing and ability to control the lips, and swallowing. Dysphagia, although less common than drooling, is also well recognized (Parkinson, 1817; Eadie and Tyrer, 1965a) and can occasionally be life threatening (Cotzias *et al.*, 1969; Calne *et al.*, 1970). Changes in the oesophagus in patients with Parkinsonism have been noted, particularly abnormalities of motility (Penner and Druckerman, 1942; Brombart, 1961; Eadie and Tyrer, 1965b). Silbiger *et al.* (1967) reported a high incidence of pharyngeal disturbance, and Calne *et al.* (1970) demonstrated slow deglutition. Only one previous report of oesophageal dilatation in Parkinsonism has been found (Elbaum *et al.*, 1963), although dilatation of other parts of the gastrointestinal system including colon and small bowel have been reported (Lewitan *et al.*, 1951). The present report is a review of 37 consecutive barium swallows in patients with Parkinsonism and demonstrates a high incidence of dilated oesophagus.

### METHOD

Thirty-seven patients with Parkinsonism attending the Westminster Hospital Group had routine

barium swallows and the findings are described. The diagnosis of Parkinsonism was made on the clinical findings of tremor, rigidity, and bradykinesia.

A control group, of similar age and sex, was selected from consecutive patients undergoing routine barium swallows for various other complaints.

The age, sex, length of history, treatment, aetiology, concurrent illness, and presence of gastrointestinal symptoms were recorded.

The diameter of the oesophagus was measured between the 8th and 10th dorsal vertebrae. Films were taken with the patient standing and rotated 35°-45° to the left. Fluid barium sulphate (Micropaque, Damancy) was used and the measurements were taken from the film showing the maximum oesophageal diameter between the 8th and 10th dorsal vertebrae. In no case was the kyphosis of the patient so severe as to lead to significant increase in the diameter due to the increased focal film distance. An assessment was also made of the type of peristalsis present; whether tertiary or incoordinate contractions were visible and if there was initial hesitation in deglutition, with pooling of barium in the vallecula or piriform sinuses. If any residuum was visible, this was recorded.

### RESULTS

The oesophagus was reported as being dilated in six patients. The sex incidence was the same whether the oesophagus was dilated or not. Furthermore, average age and length of history was similar in both groups.

Of those who were found to have a dilated oesophagus, two were taking atropinics alone, three both atropinics and levodopa, and one was

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not on drug therapy. Of those without dilatation of the oesophagus, eight were taking atropinics alone, two levodopa alone, 16 both, and two patients were taking nothing. There was no obvious difference in dosage and length of treatment with atropinics in the two groups.

Suitable films were available for measurement in four of the group reported as having dilated oesophagus and in each case the diameter was 4 cm or greater. In 26 patients it was possible to make adequate measurements of the oesophageal diameter. In eight patients there were no appropriate films of the swallow for measurement. In three patients only a cine-radiological examination of the oesophagus had been performed, and an absolute measurement of the diameter could not be made. The mean oesophageal diameter in the patients with Parkinsonism was 3.11 cm (SD 0.97) and in the controls 2.24 cm (SD 0.4). The difference between the means is highly significant ( $P < 0.01$ ).

The results also show that there is no clear relationship between the age of the patients or the length of history and the width of the oesophagus. Neither was there a correlation between the type of medication and the size of the oesophagus in those with Parkinsonism. However, it cannot be disproved that in part the oesophageal dilatation is related to drug therapy. The failure to find a relationship between therapy and oesophageal diameter in patients with

Parkinsonism makes it unlikely that the therapy is a significant cause of dilatation.

#### DISCUSSION

This study shows a high incidence of dilated oesophagus in patients with Parkinsonism (Fig. 1). Patients who were attending hospital were not selected and may contain a higher proportion of severely handicapped patients than would occur in general practice. They were not selected because of gastrointestinal symptoms and there were no other reasons to consider this series as unrepresentative of patients with Parkinsonism.

Only one previous report of oesophageal dilatation in Parkinsonism has been found in the literature (Elbaum *et al.*, 1963) and it is therefore surprising that the present series shows such a high incidence. There was no evidence that these patients had either a structural abnormality or carcinoma which might have led to dilatation. The group as a whole was elderly with an average

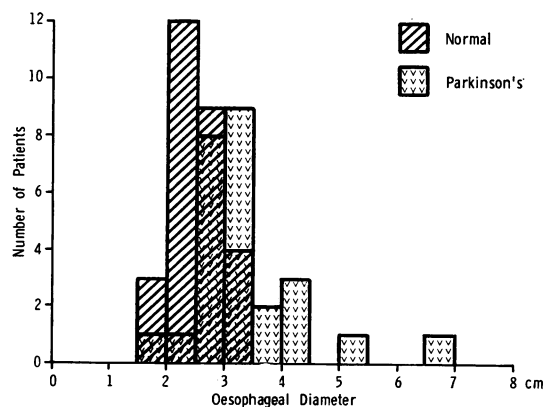


FIG. 1. Histogram of the oesophageal diameter at the level of the 8th to 10th dorsal vertebrae in patients with Parkinson's disease and in a comparable control group.

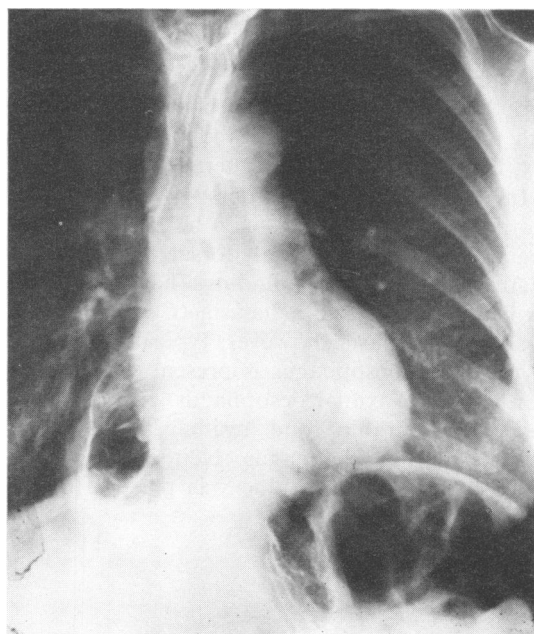


FIG. 2. Radiograph of the chest of patient taken 30 minutes after a barium meal showing dilated oesophagus with some residual barium.

age of 66 years. However, there is no evidence that mega-oesophagus is more common at this age, and, in fact, it usually presents at 30 to 40 years of age (Naish and Read, 1965). Our control group was matched for age and sex and contained none with oesophageal dilatation. The routine report on the barium swallows was substantiated by measurement of the oesophagus at the level of the 8th to 10th dorsal vertebrae. It was found that the vast majority of measurements in patients with Parkinsonism fell within the range of 2.5 cm to 3.5 cm; only five patients had an oesophageal diameter of 4.0 cm or above. There is thus an increase in the average oesophageal diameter in Parkinsonism and, in addition, a few patients have greatly increased oesophageal diameters (Fig. 2). Eadie and Tyrer (1965b) carried out radiological studies of the upper alimentary tract in 72 patients with Parkinsonism. They found segmental spasm in 5.6% but no mega-oesophagus, while we found abnormal peristalsis in nine patients (25%). Hiatus hernia and gastro-oesophageal reflux was present in 26.4% of their series, and 14% in ours. There was no apparent difference in the type of patients in their series and in ours, so the different results cannot be explained on this basis.

This is the first reported series of dilated oesophagus in Parkinsonism and an incidence of 16% has been noted. The mechanisms are difficult to determine but seem independent of age, sex, length of history, and therapy.

In Parkinsonism disorders of oesophageal motility do occur and may be secondary to degeneration of the vagal dorsal motor nuclei (Eadie, 1963). Similar findings have been described in idiopathic achalasia (Cassella *et al.*, 1964). In achalasia, however, typical narrowing of the lower oesophagus is present with dilatation of the proximal oesophagus. In almost all cases considerable food residue and fluid is present in the oesophagus. Neither narrowing nor fluid and food residue was present in any

patient in our series and in one case only of those with dilatation of the oesophagus did the patient complain of dysphagia. It is unlikely, therefore, that patients with Parkinsonism will suffer pulmonary changes due to spill-over of oesophageal contents and tend to develop carcinoma of the oesophagus as occurs in achalasia (Truelove and Reynell, 1972). Further, it seems there is no need for therapy to be changed because of oesophageal dilatation.

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