

## Is esophageal dysphagia in the extreme elderly ( $\geq 80$ years) different to dysphagia younger adults? A clinical motility service audit

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**SUMMARY.** Dysphagia in elderly patients has major effects on nutrition and quality of life. Although aging itself is associated with changes in esophageal motility, the impact of this on symptoms such as dysphagia is unclear. Data in the extreme elderly are also limited. Symptoms and manometric diagnoses from 23 consecutive older patients (older dysphagia [OD])  $\geq 80$  reporting esophageal dysphagia (12 female, mean age 83 (range 80–93) were compared with those from 23 gender matched younger patients (young dysphagia [YD]) also with dysphagia (mean age 35, range [17–46]). More older patients reported dysphagia as their primary symptom (OD 22/23 vs YD 14/23,  $P = 0.005$ ). Overall, dysphagia was most common for solids only (OD 16/23 vs YD 15/23) and rare for liquids only (OD 1/23 vs YD 3/23). Dysphagia for both liquids and solids was more frequent in older patients (OD 6/23 vs YD 1/23,  $P < 0.05$ ). Fewer older patients reported heartburn (OD 3/23 vs YD 14/23,  $P = 0.001$ ). Manometric diagnoses were generally similar between OD and YD patients with the most common diagnoses being ‘nonspecific esophageal motility disorder’ (nine each) and ‘ineffective peristalsis’ (OD = 6, YD = 7). There was a trend for diagnoses related to lower esophageal sphincter failure to be more frequent in younger subjects (OD 1 vs YD 7,  $P = 0.053$ ). Despite differences in symptom patterns, broad manometric diagnoses in the extreme elderly with dysphagia are similar to younger dysphagia patients. Further studies are required to determine whether this relates to insensitivity in recording or reporting of esophageal manometry (or perceptual differences associated with aging).

**KEY WORDS:** dysphagia, elderly, esophageal motility, manometry, reflux.

### INTRODUCTION

Dysphagia in the elderly is common, with more than 10% of people older than 50 years reporting some degree of swallow dysfunction and its prevalence increasing with age.<sup>1,2</sup> Although dysphagia is an important alarm symptom for esophageal carcinoma, most patients do not have malignancy.<sup>3</sup> However, even in patients without cancer, the decrease in

caloric intake because of difficulty in swallowing has a negative impact on quality of life, particularly in the elderly, whose nutritional status may already be compromised<sup>4</sup> as a result of other conditions such as anorexia of aging.<sup>5–7</sup>

After exclusion of structural lesions, many patients with esophageal dysphagia undergo manometry to provide guidance for therapy. While a number of studies have reported on the diagnostic categories underlying swallowing dysfunction, these have been performed in predominantly young or middle-aged individuals and there are limited data on the diagnoses in the elderly,<sup>8</sup> and no data in the very elderly. As aging has important effects per se on esophageal function,<sup>9–12</sup> the degree to which the findings from younger patients can be extrapolated to older patients who are the most rapidly increasing proportion of the population is unclear.

The aim of the current study was to determine the manometric diagnoses of elderly ( $\geq 80$  years) patients

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with dysphagia and to see if these differed from those in younger patients also reporting dysphagia.

## MATERIALS AND METHODS

The clinical manometry laboratory at the Repatriation General Hospital services a regional population of ~300 000 in a metropolitan setting and, in keeping with the hospital's overall direction, has a focus on delivering health care to older subjects. Since December 2003, all manometry studies have been prospectively recorded on a database. This database was audited to identify older subjects ( $\geq 80$  years) with esophageal dysphagia. Clinical and manometric data from these patients were compared to that from a control group of younger patients from the database also reporting esophageal dysphagia. We hypothesized that there would be significant differences between the older and younger subjects with respect to both manometric diagnoses and symptoms.

A total of 32 subjects 80 years of age or older were in the database, 23 of these had dysphagia recorded as a symptom at referral. Older patients were gender matched to younger patients, from the same database, who also complained of dysphagia. This was achieved by sorting the database by ascending age and then identifying sequential patients with dysphagia (of the appropriate gender) beginning with the youngest patient on the database. Gender matching continued with sequential 'young' patients until a young dysphagia (YD) control was assigned to each older dysphagia (OD) subject. Patients with a known diagnosis prior to the manometric study were excluded.

The clinical manometry database has been previously approved by the local human research and ethics committee. At the time of their study, each patient gave informed consent to be entered onto the database for clinical and research purposes.

Manometric studies were performed according to a standardized protocol, using a 16-channel perfused catheter (Dentsleeve, Adelaide, SA, Australia). Eight side holes were located at 3-cm intervals along the esophageal body, with a further eight side holes at 1-cm intervals in the region of the lower esophageal sphincter (LES). The side holes thus spanned a total of 31 cm. Catheter placement was judged by manometric criteria, by experienced technicians, with medical or radiological assistance if required. Ten wet swallows of 5 mL each were performed in both the right lateral and the sitting positions, for a total of 20 wet swallows. Most studies also included five solid swallows (of bread) in the sitting position. Pressure data were collected at 25 Hz using Trace! 1.2 (GS Hebbard, Melbourne, Australia) and recorded direct to disk where they were available for later analysis. End expiratory basal LES pressure was referenced to

end expiratory intragastric pressure and determined by the TRACE program. A peristaltic sequence was regarded as normal if the amplitude of each propagated pressure wave was  $>10$  mmHg in proximal and  $>20$  mmHg in the distal esophageal body. A transient lower esophageal relaxation was defined according to the criteria of Holloway *et al.*<sup>13</sup> Other manometric diagnoses were defined as per standard criteria.<sup>14</sup>

Analysis was generally undertaken within 10 days of each study; after which, the database entry was made. Referral details and presenting symptoms were recorded by the technician at the time of each manometric study and entered into the database.

The database entry was used as the source document to extract symptom details and manometric findings. Each patient's entry was reviewed for symptom characteristics and manometric diagnosis(es). Symptomatic variables analyzed include: dominant symptom, all recorded symptoms and characteristics of dysphagia – solids, liquids or both. The manometric diagnosis(es) was (were) those provided on the report to the requesting doctor. More than one manometric diagnosis was allowed if reported on the manometry report (e.g. low basal (LES) and hypotensive peristalsis).

Data were compared between age groups using contingency tables assessed with a two-tailed Fisher's exact test. A *P* value less than 0.05 was regarded as significant.

## RESULTS

The 23 OD subjects had a mean age of 83 years (range 80–93). The YD control group had a mean age of 35 years (17–46). Twelve patients were female in each group. One younger patient was later withdrawn from the analysis as a remote history of fundoplication was discovered on data review.

In order to achieve a gender matched control group, 123 sequential younger patients' (17–46 years) symptoms were reviewed, 52 males and 71 females. Of the 52 males, 12 had dysphagia, one was excluded because of known achalasia, leaving  $n = 11$  (age range 17–46 years). Of the 71 women, 34 had dysphagia and thus, recruitment of female dysphagia controls was terminated after the youngest 12 were identified (age range 17–38 years).

Dysphagia was a significantly less frequent reason for referral in younger patients 46/123 (37%) than in older subjects 23/32 (72%), ( $P = 0.0006$ ). In the younger group, women were more likely to report dysphagia as a symptom than men (young women 34/71 [48%] vs young men 12/52 [23%],  $P = 0.0079$ ). However, an equal gender balance was seen (16 each male and female) in the 32 elderly subjects referred for manometry, and moreover, there was also an

**Table 1** Comparison of age, gender, previous diagnoses of CVA and GERD, PPI usage, esophagitis at endoscopy and abnormal pH-metry in older and younger patients

	Older ( <i>n</i> = 23)	Younger ( <i>n</i> = 23)
Mean age (range)	83 (80–93)	35 (17–46)
Gender (M : F)	11 : 12	11 : 12
Past history CVA	2	0
Clinical diagnosis GORD	13	9
Regular PPI (no)	14	10
Endoscopic esophagitis†	5	3
Abnormal pH-metry‡	2	4

†Twenty-two older patients and 23 younger patients had undergone endoscopy. ‡Three older and 13 younger patients had been studied with pH-metry. CVA, cerebrovascular accident; GERD, gastroesophageal reflux disease; PPI, proton pump inhibitors; M, male; F, female.

equal gender balance seen in the elderly patients reporting dysphagia (12/16 females and 11/16 males).

The clinical presentation of dysphagia varied between older and younger subjects. A greater proportion of the older subjects gave dysphagia as their primary symptom (OD 22/23 vs YD 14/22;  $P < 0.01$ ). There was a trend for older subjects to be more likely to have dysphagia for both liquids and solids than younger subjects (OD 6/23 vs YD 1/22;  $P = 0.096$ ). Both age groups had similar rates of dysphagia for solids only (OD 16/23 vs YD 15/22;  $P = \text{ns}$ ) and liquids only (OD 1/23 vs YD 3/22;  $P = \text{ns}$ ). Younger dysphagia patients were, however, more likely to report heartburn as a symptom compared to the older subjects (YD 14/22 vs OD 3/23;  $P < 0.001$ ). Other clinical details of the patient groups are given in Table 1.

The manometric diagnoses for each age group are shown in Table 2. There was no difference in the most common manometric diagnoses between age groups. There was a trend towards a diagnosis of nonswallow-related LES relaxations or low basal

**Table 2** Manometric diagnoses on older and younger subjects as reported

Manometric diagnosis (per report)	Older subjects	Younger subjects
Nonspecific esophageal motility disorder	9	9
Failure of or ineffective peristalsis	6	7
Normal motility	3	4
Nonswallow-related LES relaxations	0	4
Low basal LES pressure	1	3
Achalasia or pseudoachalasia	2	2
Vascular compression	2	0
Impaired upper esophageal sphincter relaxation	2	0
Impaired LES relaxation	1	1
High amplitude contractions	1	1
Cricopharyngeal bar	1	0
Diffuse esophageal spasm	1	0
Synchronous contractions	1	0
Total diagnoses	30	31

LES, lower esophageal sphincter.

**Table 3** Esophageal manometric parameters for older and younger patients with dysphagia

Parameter	Elderly	Young	<i>P</i> value
Basal LES pressure (mmHg)	26.1 ± 3.70	16.8 ± 1.85	0.031
% Failed swallows			
Right lateral	63 ± 7.77	32 ± 7.25	0.006
Upright	49 ± 8.57	47 ± 7.78	0.8
Solids	56 ± 11.04	45 ± 6.63	0.4

LES, lower esophageal sphincter.

LES being more common in the younger group (YD 7/31 [23%] diagnoses vs OD 1/30 [3%] diagnoses,  $P = 0.053$ ). A number of diagnoses seen in the older group were not seen in the younger group. These included vascular compression ( $n = 2$ ), impaired upper esophageal sphincter relaxation ( $n = 2$ ), cricopharyngeal bar ( $n = 1$ ), diffuse esophageal spasm ( $n = 1$ ) and synchronous contractions ( $n = 1$ ). Vascular compression was diagnosed on the basis of a typical pulsatile impression during manometry at cardiac frequency and confirmed at either endoscopy or radiology.

Basal LES pressures were lower in the younger patients (Table 3). There was no difference in proportion of failed swallows with either water or bread boluses when upright, although there was an increased frequency of peristaltic failure in the older patients when in the right lateral position.

## DISCUSSION

This is the first study to assess the relationship between dysphagia and motor abnormalities in a large cohort of patients 80+ years of age. While there were no major differences in broad diagnostic categories between older and younger patients with dysphagia, swallow-related symptoms were more prominent in the elderly and more likely to be present with both solids and liquids. In addition, the incidence of dysphagia was higher in older (72%) than younger subjects (37%) referred for manometry.

The data in the current study are in broad agreement with earlier reports in which the diagnoses between older and younger patients were found to be similar.<sup>8</sup> In this study however, the older patients were approximately 10 years younger than those in the current study. In addition, there was a very high (approximately 30%) rate of achalasia in the earlier study suggesting a more high selected patient population than the current report where the incidence was approximately 10%. Thus, our data extend the earlier findings and show that dysphagia, even in extreme elderly patients as old as 90 years, is associated with similar manometric diagnoses to younger patients and also provide reassurance that these findings are applicable to the general community.

The symptomatic and subtle manometric differences between the age groups seen in the current study, such as an increased incidence of heartburn reported by younger subjects together with more frequent manometric findings consistent with gastroesophageal reflux disease in this group (low basal LES pressure and nonswallow-related LES relaxations), suggest potential differences in dysphagia mechanisms. However, differences in referral patterns may also be important. Consistent with a difference in mechanisms, low basal LES pressure was seen in only one subject in the older group and inappropriate LES relaxations were not seen at all. On the other hand, diagnoses in the elderly of impaired upper esophageal relaxation ( $n = 2$ ), vascular compression ( $n = 2$ ), synchronous contractions ( $n = 1$ ), diffuse esophageal spasm ( $n = 1$ ) and cricopharyngeal bar ( $n = 1$ ) were not seen in any YD patient. It seems unlikely that these diagnoses are directly attributable to comorbidities seen in the older group. Although the numbers are small, these findings (except vascular compression) suggest that older patients have more spastic disorders while younger subjects have more motor dysfunction related to reflux disease underlying their dysphagia. However, studies with larger numbers are required to evaluate this further. It may also be that standard clinical manometric analysis is not sufficiently rigorous to delineate real, but subtle, differences in dysphagia mechanisms between age groups.

The finding that heartburn was more commonly reported in the young patients also suggests that reflux may have a more common association with dysphagia in younger patients. This may, in part, reflect the reason for referral to the service, for example, studies performed in patients being considered for fundoplication. Alternatively, the difference in the incidence of heartburn may reflect changes in visceral sensory function associated with aging.<sup>4,7</sup> A relative insensitivity to visceral pain has been suggested in older subjects and may explain the increased mortality in the elderly from undiagnosed complications of peptic ulcer disease<sup>15</sup> and high rates of Barrett's in older adults without heartburn.<sup>16</sup> As not all subjects underwent 24-hour pH studies, and these studies were not standardized for acid suppression therapy, it is not possible to evaluate this issue further with the current dataset. These issues are important and deserve evaluation in prospective controlled studies.

In summary, among patients referred to a clinical motility service, older subjects with esophageal dysphagia have similar overall manometric diagnoses to younger patients. However in this patient cohort dys-

phagia is more common in those over 80, more likely to be the dominant symptom and more frequently seen with both solids and liquids. These data suggest differences may exist in both etiology and mechanisms of dysphagia between the age groups which are not recognized by standard manometric classification. As dysphagia in the elderly has the potential to impair quality of life, nutrition and even survival, more detailed evaluation of esophageal motility and its relationship to bolus transit and symptoms is indicated.

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