

Prospective study of the outcomes of patients with enteral feeding in acute medical wards

LETTER TO THE EDITOR

HY Leung MRCP, FHKAM (Medicine), **T Kwok** FRCP, FHKAM (Medicine), **E Lau** Registered nurse

Division of Geriatrics, Department of Medicine and Therapeutics, The Chinese University of Hong Kong, Hong Kong

Correspondence to: Dr Ho-Yin Leung, Department of Medicine, North District Hospital, Hong Kong SAR, China. E-mail: leunghy1@ha.org.hk

To the Editor—The nutritional support of acutely ill patients is important to their recovery process. Yet many such patients have poor oral intake for a variety of reasons, and enteral feeding via the nasogastric route is frequently resorted to. There are limited data on the outcomes and complications of such intervention. Frail older people in community hospitals and nursing homes started on enteral feeding have a poor prognosis.^{1,2} There is controversy about the long-term benefit of tube feeding, especially among the demented patients.³ Data on the outcomes of enteral feeding in the setting of acute medical wards are limited. We therefore conducted a prospective study to investigate the outcomes of patients receiving enteral feeding in acute medical wards in Hong Kong.

During a 6-week period, a research nurse identified patients started on enteral feeding in the 10 acute medical wards of our hospital. The hospital caters to a population of one million. On average, there were 1000 acute medical admissions per month and 5 days of hospital stay. Approximately 20% of the patients are transferred to a neighbouring convalescent hospital.

The patients were followed up daily until discharge; the feeding regimen was recorded, and the occurrence of pneumonia, diarrhoea and hyponatraemia assessed. The diagnosis of pneumonia was based on three of the four criteria: new infiltration on chest radiographs, respiratory rate exceeding 20 per minutes at rest, new sputum production, and oral temperature greater than 38°C (ear probe thermometer was not used at the time of the study). Diarrhoea was defined as having watery stool more than twice a day. Hyponatremia was defined as having a plasma sodium concentration of less than 135 mmol/L, not present before tube

feeding. The use of physical restraints was also recorded.

The indication of enteral feeding was obtained from the case notes, as was the outcome at hospital discharge. Readmissions were identified by the patient management computer database. Health status at 6 months after the initiation of enteral feeding was obtained by telephone, and the cause of any death ascertained by reviewing computerised hospital discharge summaries.

During the 6-week study period, 82 patients were on enteral feeding. Their mean age was 79 (standard deviation [SD], 12) years; 40% of them were male and 42% were from old age homes. Five (6%) patients received gastrostomy feeding, and the rest via nasogastric tubes. Indications for enteral feeding were: dysphagia (70%), poor oral intake (13%), and impaired consciousness (16%); in one patient the indication was unknown. Among those with dysphagia, 27 (47%) were secondary to an acute cerebrovascular accident. 19 (29%) patients were on tube feeding before the index admission.

The mean length of stay in the acute hospital was 14 (SD, 12; range, 3–74) days. Chest infection, diarrhoea, and hyponatraemia were noted in 23 (28%), 27 (33%), and 21 (26%) of the patients, respectively. 16 (19.5%) patients died during the index admission; 45 (54.9%) were transferred to the convalescence hospital; 21 (25.6 %) were discharged.

Hand restraints were applied in 31 (38%) patients. The most used feeding formula was Isocal (used in 28% of the patients). Total feed volumes in the beginning varied from 300 mL to 1500 mL (2 modes were 500 mL and 1000 mL daily). Bolus feeding by gravity (given over 30 minutes) three to five times

TABLE
Outcomes of those surviving at 6 months (n=44*)

Outcome	No. (%)
Place of residence	
Old age home	27 (61)
Infirmity/hospital	1 (2)
Own home	15 (34)
Mode of feeding	
Resumed oral feeding	16 (36)
Via gastrostomy	8 (18)

* One subject could not be traced

a day was used in most patients, followed by pump feeding in 5 (6%). The feeding regimen of 42 (51 %) patients was assessed by a dietician; in the remainder it was determined by the doctor in charge.

Of 82 patients, 44 (54%) were still alive at the 6-month follow-up, 6 (20%) died during the index admission, 14 (17%) died after transfer to the convalescence hospital, and 8 (10%) died after discharge. 27 (52%) of the 52 discharges had one or more readmissions. The outcomes of the 44 survivors at 6 months are shown in the TABLE. 22 (58%) deaths at 6 months were due to pneumonia; other causes of death were cardiovascular disorders (24%), malignancy (8%), infected bed sores (5%), and others (5%).

Our study confirmed that tube feeding was common in acute hospitals. These patients had high complications rates and high short- and long-term mortality. Only one in five were able to resume oral feeding at 6 months.

Tube feeding is regarded as a safe, efficient and relatively inexpensive method for supplying nutrients in selected patients,¹ and is recommended for patients who have difficulty in taking adequate nutrition orally. Yet various complications associated with the placement and use of feeding tubes have been described.² Observational studies in nursing homes for demented residents have indicated no long-term survival benefit from tube feeding,⁴ except in those with swallowing difficulties.⁵

The high incidence of complications, particularly chest infection, from enteral feeding is a concern, even though the causative mechanism is uncertain. The commonest reason for starting enteral feeding was dysphagia. Yet there is no evidence that aspiration

pneumonia can be prevented by tube feeding. The quality of the administered enteral feeding may play a role in the liability to aspiration pneumonia. Thus, such procedures should be standardised and subject to audit.

Gastrointestinal complications are common in patients with tube feeding. The high osmotic load from enteral feeding of supplements commonly causes diarrhoea. The frequent use of antibiotics in the medical setting further increases risk. The choice of feeding supplement is important and dieticians can play a useful role in management.

Acutely ill patients are at high risk of hyponatraemia. Some feeding supplements are relatively low in sodium content, and the problem is compounded by the use of half strength supplements at the initiation of enteral feeding, as well as by diarrhoea. Serum sodium should therefore be monitored in these acutely ill patients. Once hyponatraemia is recognised, the choice of supplement should be reviewed by the dietician and sodium supplement added as required.

The choice of the feeding formula and the feed volumes were heterogeneous. Dieticians were involved in only half of the cases. Some of the feeding regimens were obviously inadequate for maintaining nutrition. Dieticians can play a useful role in the selection of supplements, especially when there are complications like hyponatraemia and diarrhoea.

Percutaneous endoscopic gastrostomy was rarely used. It is better tolerated and may reduce incidence of aspiration pneumonia, and is recommended in those likely to require long-term enteral feeding.

The outcomes of our subjects were poor as reflected by the high mortality rate, high readmission rate, and low oral feeding resumption rate. These findings were consistent with previous studies on patients with tube feeding.³ The frequent use of hand restraints to secure tube feeding in patients with very limited life expectancy undoubtedly aggravates their suffering. The decision to tube feed and its continued use despite poor patient tolerance requires very careful medical and ethical consideration.

In summary, patients who were started on tube feeding in acute medical wards had high mortality and a poor prognosis. Complications of tube feeding were common, although these could have been due to the patient's underlying medical condition. Audit is required to ensure safety procedures for tube feeding are adhered to, as are ways to prevent aspiration

pneumonia. The decision to tube feed should be taken after due consideration of its potential benefits and burdens to the patient.

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