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Research Letters

A majority of tube-fed patients are on medications that require special precautions

SIR—Many patients in general hospitals receive food and medication through enteral feeding tubes [1]. Although common in clinical practice, this form of medication delivery is not always effective or safe and can lead to interactions, altered bioavailability, reduced absorption due to drug–nutrient interaction, altered pharmacokinetics, osmotic adverse effects due to sorbitol (a suspension vehicle) and tube blockage [2–5]. Interactions with enteral feeding formulae are the commonest cause of drug interactions in tube-fed patients and are more likely in tube-fed patients [6]. It is, therefore, imperative that when medications are being co-administered with food in tube-fed patients, special instructions are issued to administering personnel in an effort to maximise efficacy of medication and minimise the risk of adverse events, including selection of appropriate formulations, dose adjustment, special instructions such as dilution of the formulation to prevent caking, withholding feeding around medication timings, upright posture and post-dose flushing instructions. The extent to which this may be a problem in general hospitals has not yet been quantified.

We undertook a study in our institution to determine the prevalence of prescription of medications that required special precaution in tube-fed patients.

Methods

A point prevalence survey of all adult inpatients in medical and surgical wards of a teaching hospital (n = 480) was conducted. Data regarding all medications being administered regularly or on an as required basis, including dose and route of delivery via enteral tube, and complications such as clogging, were collected by the survey team made up of two doctors. Hospital pharmacists and published sources were used to identify medications that needed special precautions.

Results

We identified 24 adults who were being fed through enteral tubes, 11 (46%) with a percutaneous gastrostomy tube and 13 (54%) with an 8-Fr nasogastric tube. The mean age was 71 (range 36–91), and 13 (54%) were men. This represented 5% of all patients in the general wards and 20% on the geriatric medicine ward. These patients had multiple comorbidities: reasons for enteral feeding included neurological conditions (mainly stroke) and psychiatric, surgical, oncological and gastrointestinal tract-related causes. At the time of the study, all of these patients (except one patient with a diagnosis of anorexia nervosa) were also being administered their medications via the enteral route.

The patients were on multiple medications, on average 13 ± 5 medications (range 5–25). Only 20% of the prescribed medications could be administered unchanged in the prescribed form: the remainder required either crushing (45%) or 'special precautions' (35%) prior to their administration.

Among those requiring special precautions, the most common concern was potential for clogging of the tubes. This was noted in 23 (99%) of the studied patients, and possible medications associated included the ubiquitous use of gastroresistant lansoprazole (20), bulk-forming laxatives (23), enteric-coated aspirin (12) and prednisolone (4). The use of more than two drugs associated with tube clogging was seen in 20/24 patients. None of the patients surveyed had a blocked enteral tube at the time of data collection. The current protocol in our institution to minimise the risk of clogging involves flushing with 30 ml of sterile water before and after the tube is used for delivery of medication as well as at commencement or termination of feed.

Nine patients (40%) were on medications that required adjustment in feeding timing. Four patients were on more than one such medication (a maximum of three different medications), which required adjustment of feeding schedule to prevent nutrient–drug interaction. The need for withholding feed for 4 h after, and 30 min before, medication significantly reduces nutrient delivery and renders these medications problematic for use via the enteric route.

Eight (30%) patients were on medications that were prescribed in a sustained or modified release preparation, unsuitable for use via enteral tube. These included opiates, sulfonylureas, warfarin and Sinemet CR; two (8%) patients were prescribed more than one such medication.

Discussion

The main finding of our study was that almost one in 20 patients in a general hospital received their medications through enteral tubes, with widespread use of medications requiring special precautions or instructions for tube-fed patients. All patients studied were on at least one such medication, while a majority were on multiple medications.

Surprisingly, although the principal mode of delivery of these medications was crushing, only one-third of the prescribed medication could be safely delivered in this manner.

With studies showing that one in every three tube-fed patients in the community has clogged feeding tubes annually, and one in every four tube-fed patients requires tube replacement on multiple occasions [7], our study (showing that 80% of patients were at high risk of tube clogging due to the manner of their medication delivery) suggests a common cause for such complications.

While direct effects such as tube clogging are easily quantified, issues relating to drug toxicity such as hypoglycaemic events, therapeutic failures such as poorly controlled epilepsy [8], warfarin resistance [9] and persistent parkinsonian symptoms [10] are lesser studied, although anecdotally reported, complications. Seventy percent of patients in our study had been prescribed medications that, when crushed or co-administered with feeding formulations, have been reported to result in such adverse outcomes. If unrecognised, this may add to the investigative burden of these, often very unwell, patients.

Since delivery of medications via enteral tube is common in everyday practice and is potentially associated with a range of adverse events, development is required of protocols and guidelines for the safe use of medications with enteral feeding tubes. There is also a need for an increased awareness among pharmaceutical regulatory bodies of this aspect of the complexities of prescribing for older people, the group who are most likely to receive medications through enteral tubes [1]. Both the American Geriatrics Society and the European Union Geriatric Medicine Society have initiated a dialogue with medication regulation agencies in the USA and Europe on the importance of incorporating specific gerontological and geriatric medicine knowledge into the licensing of medicines that are likely to be used by older people. In addition, the British Association of Parenteral and Enteral Nutrition has published guidelines for pharmacists, general practitioners and patients, which could be expanded upon for use in the acute hospital setting. Equally, major prescribing guides, such as the British National Formulary [11], might consider adding a separate section on prescribing and enteral tubes, in the same way that they include sections on prescribing and pregnancy, liver disease and renal disease.

Key points

- Co-administration with food and crushing of medication are common in tube-fed patients.
- Alters the pharmacokinetics of medications.
- Majority of tube-fed patients are on medications that require special precautions.
- Inappropriate formulation prescribed frequently.
- Need for increased awareness regarding potential adverse events.

Conflicts of interest

None declared.

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Validation and feasibility of the Global Mental Health Assessment Tool—Primary Care Version (GMHAT/PC) in older adults

SIR—Mental health problems are one of the leading causes of disability in the world, particularly in the geriatric population