

Causes for the unplanned removal of the feeding tube in intensive care

Causas da retirada não planejada da sonda de alimentação em terapia intensiva

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Descritores

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Abstract

Objective: Describe the main causes for the loss of the feeding tube and analyze the actions that had an impact towards the reduction of this adverse event.

Methods: Cross-sectional study with secondary data from 4228 patients/day using a feeding tube.

Results: The main causes for the loss of the tube were: removal by the patient (50%) and obstruction of the tube (36%). The correlation of the loss of the feeding tube with alterations in the patients' cognition (delirium and dementia) and the incrustation of residues in the lumen of the tube were observed.

Conclusion: The main causes for the removal of the feeding tube were related to the patient and the obstruction. Proactive measures to prevent the obstruction of the tube had a good impact during the period in which they were applied, whereas other measures had low impact.

Resumo

Objetivo: Descrever as principais causas da perda da sonda de alimentação e analisar as ações que tiveram impacto para a redução desta intercorrência.

Métodos: Trata-se de um estudo transversal com dados secundários provenientes de 4228 pacientes/dia com sonda de alimentação.

Resultados: As causas da perda da sonda foram: a retirada pelo paciente (50%) e obstrução da sonda (36%). Observadas a correlação da perda da sonda enteral com alterações da cognição dos pacientes (delirium e demência) e a incrustação de resíduos no lúmen da sonda.

Conclusão: As principais causas de retirada da sonda de alimentação foram relacionadas ao paciente e à obstrução. As medidas proativas para evitar a obstrução da sonda foram impactantes no período em que foram aplicadas as demais medidas tiveram baixo impacto.

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Introduction

The incidence of the loss of the nasoenteral feeding tube due to unplanned dislodgment and obstruction is considered an indicator of result, and the maintenance of its permeability, fixation, administration of diets and medications is related to the nursing care.

It is worth highlighting that several terms are adopted to evaluate this incident involving the feeding tube, such as loss of the enteral tube, unplanned removal, inadvertent removal, unscheduled removal, accidental removal, among others.

The enteral access allows both the infusion of nutrients and the administration of medications in the gastrointestinal tract of patients who cannot maintain their needs through oral ingestion.⁽¹⁾

Enteral nutrition is common in intensive care, mainly in association with the use of feeding tubes. Naso/oro enteral feeding tubes remain in place for 30 days, while enterostomies are indicated for longer periods of enteral nutrition.

Despite the benefits of enteral nutrition, its application involves risks and potential adverse events.⁽²⁾ Several terminologies exist regarding hospital patient safety, posing challenges in the categorization of occurrences and in the comparison of study results. The World Health Organization considers that an incident is an event or circumstance that resulted, or could have resulted, in unnecessary harm to the patient, with this particular harm being considered an adverse event.⁽³⁾

In intensive care there is a high frequency of tube and catheter loss, which results from the deliberate dislodgment of these devices by the patient, as well as during nursing care procedures.⁽⁴⁾ There are several factors related to the loss of the feeding tube, with consequent iatrogenic malnutrition and the need to reinstall the feeding device.

The causes for the loss of the enteral tube are related to the obstruction of the internal lumen due to the incrustation of medications and/or diets, ineffective fixation with its partial or total loss, medical and nursing procedures (extubation, intubation, transesophageal echocardiography and installation of other tube) that condition the traction and need

for repositioning, vomiting and coughing that lead to accidental dislodgments, besides the absence of records on the reason for the loss, among others.

Several studies have explored the incidents related to the loss of tubes, catheters and drains during hospitalization.⁽⁴⁻⁷⁾ Nevertheless, there is still a need for studies that may ground action plans for the reduction of this adverse event, in addition to determining the risks affecting these patients regarding the loss of these devices, particularly the feeding tube, which is broadly used in hospital units.

Patients who remove these devices stay longer in intensive care, present persistent agitation and greater daily needs for boluses of sedation and analgesic than those who do not face this incident,⁽⁵⁾ besides the family dissatisfaction and damages resulting from these situations.⁽⁶⁾ Allied to these facts, the total cost estimated for removed devices (tubes, drains and catheters) is approximately U\$7.606 and the cost/event is U\$181.⁽⁵⁾

The authors of a study developed in the hospitalization, intensive and semi-intensive care units of a private hospital in São Paulo, in Southeast Brazil, concluded that the adverse events that occurred were related to gastrointestinal tubes, with the unscheduled removal of the tube and its obstruction being the most frequent events.⁽⁷⁾ This fact agrees with the main incidents observed in the intensive care unit of a private hospital in the city of Rio de Janeiro, which is the setting of the present study.

Indicators are measures used both to describe an existing situation and to subsidize changes and tendencies of the practice, qualitative and quantitatively during a period of time.⁽⁸⁾

The objectives of this study were to describe the main causes for the unplanned removal of the feeding tube in patients in an intensive care unit and to analyze the actions that had an impact towards the reduction of this adverse event, based on improvement plans developed in the studied period.

Methods

In order to achieve the objectives proposed, a retrospective cross-sectional study was developed in

2010, in the intensive care unit of a private hospital in Rio de Janeiro, Southeast Brazil, where there are records of a long-term use of enteral feeding tubes.

Data were collected using the reports elaborated by the nurse in charge of registering events related to the nutritional therapy in the intensive care unit.

The term used in the studied hospital is rate of unplanned removal of feeding tube; this information was collected through the direct observation of the medical records and the data provided by the nursing team regarding the number of patients whose removal of the feeding tube (gastrostomy, jejunostomy, naso or oro-enteral tube) was not planned by the health care team or resulted from several causes. Several causes are understood as the removal resulting from: obstruction (including medication and diet), accidental removal by the caregiver or the patient, extubation, procedures, among others.

Data were processed statistically through percentage and relative frequencies, using as numerator the total number of patients with records of unplanned removal of the feeding tube x 1000 and as denominator the total number of patients-day using a feeding tube. The analysis of the factors involved in the unplanned removal of the device was performed using as numerator the causes for the unplanned removal x 100 / total number of feeding tubes removed in an unplanned manner.

The evaluation of this care indicator occurred on a monthly basis, with a trimestrial periodicity

of critical analysis. The framework analysis considered a historical series of the hospital comprising 30 events/1000 patients-day, as of the beginning of the monitoring, aimed at a trimestrial gradual reduction in 20%.

After the analysis of the percentages, graphic data and actions plans used in the studied period in the intensive care unit; data were analyzed by reviewing all incidents related to the unplanned removal of the feeding tube, the rates found and the results that favored the reduction of the reported incidents.

The development of the present study complied with national and international ethical guidelines for studies involving human beings.

Results

Records indicated a total of 4228 patients/day using a feeding tube in 2010 (256 to 452 patients-day/month), presenting a total of 141 unplanned removals, with a mean observed rate of 33/1000 patients-day in that year. Study participants were 253 patients. Out of these, 67% (169/253) used an enteral tube; 33% (84/253) used feeding ostomies (gastrostomies and jejunostomies) and other feeding tubes (double-lumen tube).

Figure 1 shows that the unplanned removal of the feeding tube presented lower values than the historical series recommended by the MNST (Multidis-

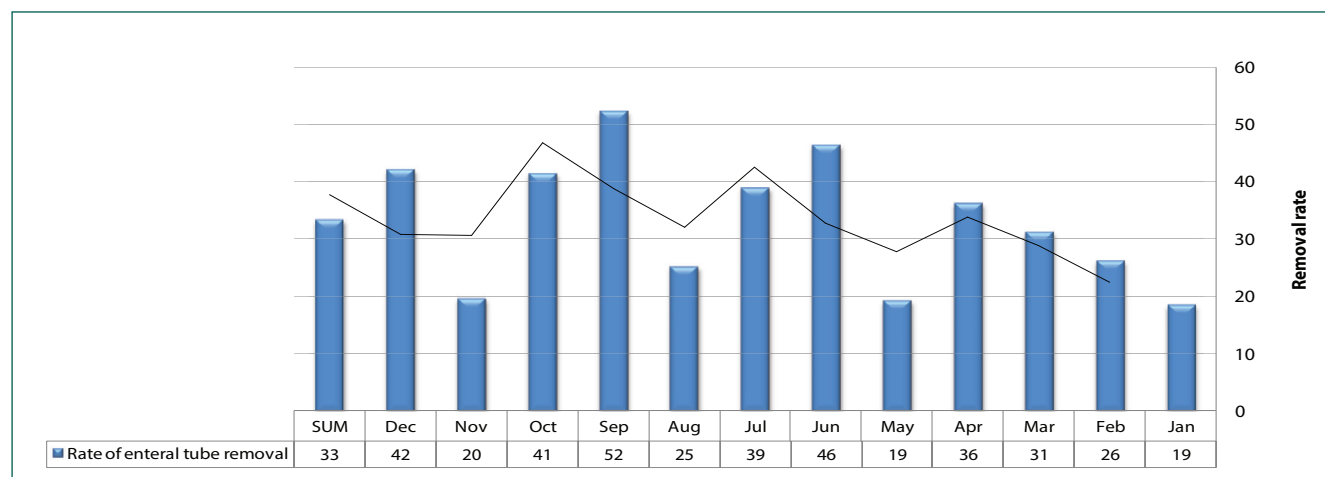


Figure 1. Distribution of the monthly rates of unplanned removal of the enteral tube

ciplinary Nutritional Support Team) in the months of January, February, May, August and November of 2010, that is, under 30/1000 patients days. Among the 121 occurrences, a mean rate of 33/1000 patients days was obtained, with an irregular tendency. The months of June, September, October and December demonstrated the highest rates.

It is worth highlighting that the critical analysis of the results and the development of the action plan were conditioned, at the time, to the trimestrial evaluation of the total of incidents and the rate of the events occurred, as presented in table 1.

Table 1. Variables of study per trimester

Variables	Trimester				Total
	First	Second	Third	Fourth	
Number of patients days with enteral tube	900	1101	1081	1146	4228
Events of unplanned tube removal	22	37	42	40	141
Rate of unplanned removal /1000 patients day	24	33	39	35	33

According to the data in table 1, a gradual increase is observed in the number of patients/day with enteral feeding tube from the third to the fourth trimester, however there was no decrease in the incidents related to the feeding tube, with poor effect in the values of excellence adopted by the MNST (30/1000).

The need to stratify the main causes for the incidents of unplanned removal of the enteral tube lead to the definition of improvement plans focused on the main incidents registered, which is presented in figure 2, as follows.

The removal of the tube by the patient occurred in 50% (71/141), followed by 36% (51/141) due to obstruction and 14% (19/141) due to other factors, such as: unknown causes, vomiting, coughing, rupture and knot in the tube, and burial of the gastrostomy tube.

The graphic analysis of the unplanned removal by the patient shows an irregular tendency, with

impact on the preventive measures in the period between July and October, with the implementation of the action plan and involvement of the team. The main factor related to this event was the presence of delirium and dementia, with recurrences in the same patient, in different periods.

The measures implemented for the reduction of the tube removal by the patients involve the evaluation of the presence of delirium and dementia, information to the team/relatives and companions regarding the risks, encouragement for the participation of the relatives/companions in the non-pharmacological measures to prevent delirium, communicating the medical team to evaluate the need for non-pharmacological measures in the treatment of delirium, greater surveillance of the team and measures of mechanical containment for a period under 12 hours until the resolution of the scenario of alteration of the cognition and/or stay of relatives.

The graphic analysis of the obstruction of the feeding tube permitted to observe a softening in the period between April and July (30%, 25%, 11% and 0%), with effect on the preventive measures developed in the second trimester.

Several observations were registered as for the possible causes for this adverse event: correlation of obstruction of the feeding tube by diets with fibers, use of coated medications with an increased potential of obstruction, irregular washing and reduced distal orifices. The action plans were based on the evaluation of medical prescriptions for medications through the tube by the pharmacist, follow-up and record of the regular preventive washing, immediate communication of any resistance during routine procedures, reduction in the use of fibers in diets, weekly washing of the enteral tube with warm water and use of a guide brush for internal washing, in case any resistance was reported.

Other causes for the unplanned removal of the tube comprised a total of 19 (14%) occurrences, namely: unknown causes (5), vomiting (2), buried bumper syndrome (3), coughing (2), tube wrapped in the mouth (2), rupture of the connection of the enteral tube (1), during upper digestive endoscopy (1), knot in the enteral tube (1), body hygiene (1), internal contraction of the jejunal tube in the group PEG/J (1).

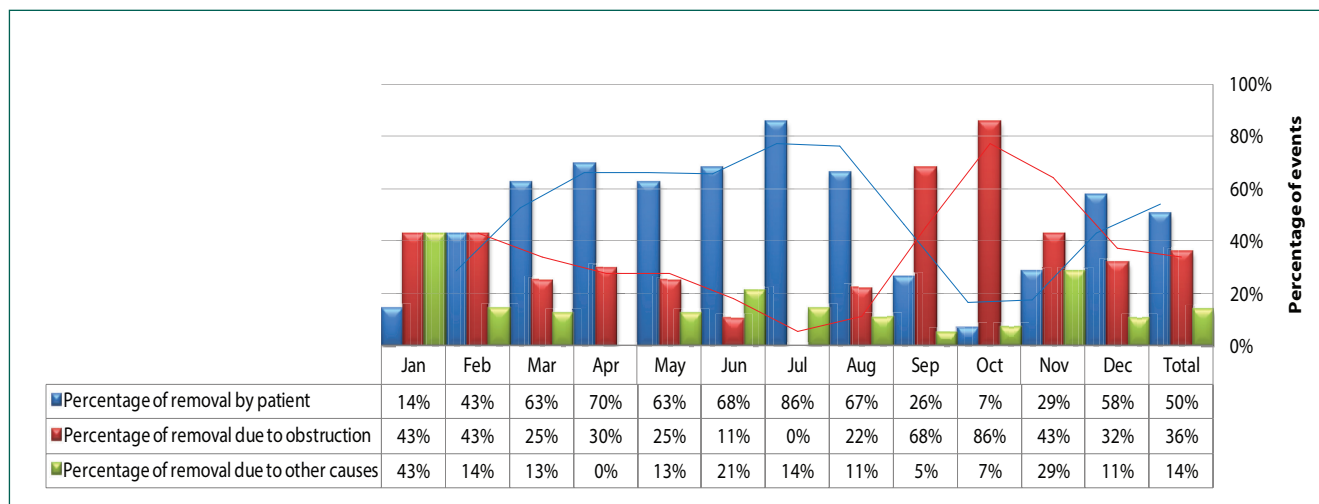


Figure 2. Incidents of unplanned removal of the feeding tube

Discussion

The limitations of the present study results include its cross-sectional design, which does not allow the establishment of cause and effect. The loss of the enteral tube was considered a pertinent and/or very pertinent indicator of the nursing care quality by 96% of the nurses from a hospital in the interior of São Paulo in 2010.⁽⁹⁾

Studies demonstrate increased incidences of losses of feeding tubes in intensive care, when compared to vascular catheters and tracheal tubes, with percentages around 40%-69.6% and rates of 44-73/1000 patients/day.^(4,7,10)

The data of the present study represented close values when compared to the literature, with an annual rate of 33 events by 1000 patients/day with feeding tube and incidence of 56% (141/253) of unplanned removal of the feeding tube.

The isolated determination of the rates of incidents that occurred during care does not provide substantial elements for the elaboration of the planning and care plans for the prevention of undesired incidents. This fact is not always found in studies of care indicators.

The identification of factors correlated to the incidents not only elucidates the preponderant causes related to the care indicators but also leads to several questions regarding situations that are not always expected, with difficulties of analysis of the real fact involved.

Nurses perform several procedures to prevent failures in the system, such as replacing damaged devices, searching for prescriptions, correcting deficits of laundry, maintenance, nutrition and pharmacy, which drift them away from evidences, from the direct care of patients as well as the supervision of nursing technicians and assistants.⁽¹¹⁾ This fact is observed in face of the demands in the implementation of care improvement actions, in the analysis of the causes for the incidents and in the implementation of actions of practice transformation.

Concerning the removal of the feeding tube by the patient, the greatest factor of impact involved alterations in cognition, especially delirium and dementia. No impact was observed in the measures of prevention and control of this situation resulting from the oscillation of the results, mainly from the difficulties to implement pharmacological and non-pharmacological measures to control delirium, involvement of the companion/relative in the surveillance, besides the use of mechanical containment that did not allow the supported reduction of the events. Mechanical containment was only implemented after medical prescription and holding approximately 10-20 cm of the upper limbs of the patient, which did not prevent the removal of the device.

Regarding the obstruction of the tube, there was a linear decrease in the occurrences in four consecutive months. The measures of impact were washing the feeding tube in 4/4 hours with a

minimum volume of 20 ml, record of permeability of the device and immediate communication of any resistance in the tube to the nurse of the unit. In face of this communication, the tube was washed with warm water and the use of a guide brush provided by the upper digestive endoscopy team for the occasional removal of residues from the feeding tube.

Provided with this measure, it was possible to verify a significant incrustation of diet/medications in the enteral feeding tube and the need to evaluate tubes in the market that would allow a lesser accumulation of residues and, consequently, a reduced risk for obstruction. The measure of washing the feeding tube cannot be continued due to the lack of a guide brush and the impossibility of only one professional developing the procedure.

Other strategies were evaluated as having a low impact, as they could not reach a totality of patients in the period, such as: reduction of the number of medications administered through the tube and reduction in the use of fibers by the patients.

It is worth highlighting that in the incidents of buried bumper syndrome, there was a need for evaluation on the part of the upper digestive endoscopy team and the installation of the enteral feeding tube, after the removal of the buried tube, being considered an adverse event that needed to be reported to the risk management group. The causes for the buried bumper were not elucidated, but the action plan was based on the general care of gastro/jejunostomy tubes, with a shared analysis by the quality group.

Since the patient is the main purpose of the nursing care, feeding tubes are a common device in intensive care, and the care of the tube is an exclusive function of nursing, the nursing team becomes the most susceptible to evaluate the main factors involved in the incidents registered and to define preventive strategies.

Regarding the impact of the measures presented, there are still barriers in the implementation, evaluation and maintenance of effective preventive measures in the unplanned removal of the feeding tube, mainly in relation to the neurological condition of the patients.

Conclusion

The main causes for the removal of the feeding tube were related to the patient and the obstruction. Proactive measures to prevent the obstruction of the tube had a good impact during the period in which they were applied, whereas other measures had low impact.

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Collaborations

Pereira SEM; Coelho MJ; Mesquita AMF; Teixeira AO and Graciano SA contributed to the project design, analysis and interpretation of data, making a critical and relevant review of the intellectual content, and to the approval of the final version to be published.

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