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Detection and management of hospital malnutrition: general guidelines versus "on the ward" sensitization as part of person-centered healthcare

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Abstract

Background and aims: This study aims to evaluate impact of a clinical pharmacist on detection and management of malnutrition in hospitalised patients as part of the development of person-centered healthcare.

Methods: A cluster-randomized controlled study. Six care units were randomised into two groups, each including one medical, one surgical and one mixed unit. In the intervention group a clinical pharmacist worked with other healthcare professionals to improve the screening and management of malnutrition. Predefined quality indicators were collected during a baseline period (two months) and an experimental period (6 months). The pharmacist was unaware of them.

Results: The percentage of patients with a complete malnutrition screening was significantly higher in the intervention group (48.2% versus 27.0%). The percentage of patients with enteral nutrition prescribed did not differ, but there were significantly more prescriptions for parenteral nutrition in the intervention group (17.4 vs 6.6%). During parenteral nutrition, triglycerides, glycemia and extended serum electrolytes were significantly more frequently measured in the intervention group.

Conclusions: Moving from a passive to a more active approach contributed to better sensitization of the hospital front professionals resulting in a better screening at admission within the 72 hours and the higher number of admitting weight and heights. Parenteral nutrition was more frequently prescribed, which may question the appropriateness of the route of artificial nutrition. The biochemical monitoring remained suboptimal.

Keywords

Clinical pharmacist, enteral nutrition, multidisciplinary nutrition committee, nutritional screening, parenteral nutrition, person-centered healthcare

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Accepted for publication: 21 May 2012

Introduction

Malnutrition has a detrimental effect on physical health which may lead to a prolonged hospital stay and increased costs for patient and society. Recently, the overall national-wide prevalence of malnutrition was estimated at 23.8% in the Netherlands and at 27.4% in Germany [1-3].

Despite its high prevalence, different studies have shown that nutritional screening and implementing adequate nutritional treatment are still not sufficiently applied by any healthcare professionals at any stage of the hospitalization period. Only 50% of malnourished patients are identified by the medical and nursing staff. Moreover, evidence demonstrates that physicians have minimal training and experience in this area of nutrition support [4-7].

Even if there are less literature data describing the function, structure and organisation of a Nutrition Support Team (NST), a recent European survey showed that NSTs

Figure 1 Outline of the study design

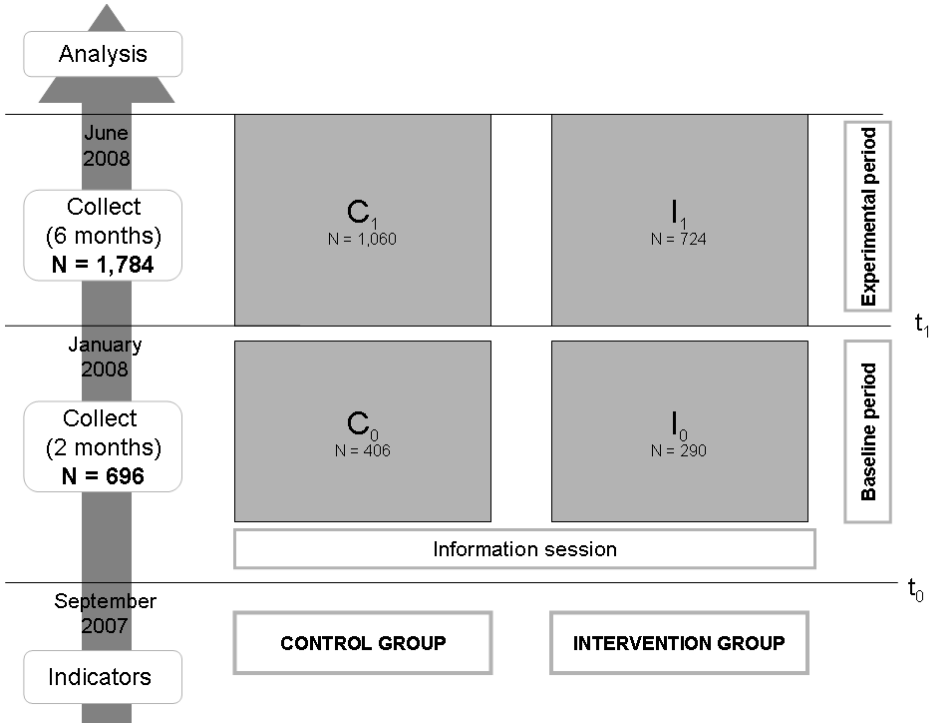

Table 1 Outcome measures. For explanation, see text

A. Basic screening and detection of malnutrition
- % of patients with complete malnutrition screening within 72h after admission*
- % of patients with weight recorded within 72h after admission
- % of patients with albumin and prealbumin checked at least once during hospital stay
- % of patients weighted at least once a week during hospital stay
B. Prescription of artificial nutrition
- % of patients receiving enteral nutrition during hospital stay
- % of patients receiving parenteral nutrition during hospital stay
C. Biochemical monitoring during parenteral nutrition
- % of patients with glycaemia measured daily during the first 3 days of parenteral nutrition
- % of patients with ≥1 extended dosage of serum electrolytes per week, including magnesium and phosphorus
- % of patients with ≥1 dosage of hepatic enzymes (AST and ALT) per week
- % of patient with ≥1 dosage of triglycerides per week

* Includes: admitted weight and height recorded and changes in weight and appetite before admission reported

have been established in 98 out of 3071 hospitals (3.2%). The authors conditioned the inclusion to at minimum one physician plus one staff (nurse, dietician or pharmacist). Their main activities were creating nutritional regimes (100%), education (87%) and monitoring nutrition therapy (92%) [8]. Although nutrition support teams (NSTs) showed their worth in clinical care as well as within the scope of medical nutrition education, the presence in European hospitals is limited, mainly due to shortages in funding. As a consequence, most hospitals (including our own hospital) are only provided with a multidisciplinary nutrition committee (MNC), aiming to sensitize hospital frontline professionals on nutritional guidelines and increasing the collaboration in nutrition field. This committee does not offer patient-specific advice on the wards. Recently, our hospital received a public funding for evaluating a more active approach on malnutrition screening and management in order to develop the person-centeredness of clinical services.

In this study we assessed the impact of a sensitization action on the ward by a clinical pharmacist as compared to our conventional passive approach.

Materials and Methods

Study design

The study was a two-armed cluster-randomized controlled prospective 6-month study in a 450-bed teaching hospital (January – June 2008). After a hospital-wide information session on malnutrition and a baseline observation of 2 months, six care units were randomised into two groups, each including a medical, a surgical and a mixed ward. All patients who were admitted to these wards and with a length of stay of more than 6 days were consecutively included in the study.

The intervention was designed by the MNC and implemented by one of its members, in this case a clinical pharmacist with specific education and training in artificial nutrition. The MNC had defined the content and objectives of the intervention and the clinical pharmacist worked in collaboration with healthcare professionals on the wards to improve the detection and the management of malnutrition, according to the hospital guidelines. The intervention consisted of the encouragements of healthcare professionals by the clinical pharmacist on nutritional screening of at-risk patients, the reduction of the fasting period, as well as the appropriate prescription and biological monitoring of parenteral nutrition. On a regular basis, the pharmacist reviewed the patient charts with the dieticians and once a week she took part to the medical round in each care unit of the intervention group.

The medical and nurse staff were informed about the conduct and purpose of the study, but were not aware of the outcome measures. Quality indicators were continuously collected at a baseline assessment period (2 months), as well as during the experimental period (6 months), as outlined in Figure 1. The clinical pharmacist was unaware of these variables. The study protocol was approved by the ethics committee of our hospital.

Outcome measures

Selected quality indicators, derived from commonly accepted international recommendations, were retrieved from the electronic medical, nurse and laboratory files by an independent observer, after discharge of the patients [9-11]. These included: (a) some quality indicators relative to malnutrition basic screening and detection; (b) data relative to the prescription of artificial nutrition and (c) data relative to the biochemical monitoring of parenteral nutrition (Table 1).

Statistical analysis

Numerical variables are expressed as means +/- standard deviations and were compared between intervention and control group by Wilcoxon rank sum test. Categorical variables were compared by chi-square test. To show the impact of the pharmacist, we used relative benefit framework by comparing the ratio differences between the intervention (I_1/I_0) and the control groups (C_1/C_0) during the baseline and the experimental period. All statistical tests are two tailed and were performed using SPSS 15.0 (SPSS Inc., Chicago, IL, USA).

Results

In total, 1,784 patients were included in the 6 months experimental period with respectively 724 patients in the intervention and 1,060 in the control group. The baseline population (696 patients) was based on a 2 month observation period with 290 patients in the intervention and 406 in the control wards, respectively. There were no statistical differences in gender, age or mean weight, as well as in length of stay between both groups during the baseline and experimental period. The patient characteristics are presented in Table 2. The results are presented in Table 3 and Table 4.

During the experimental period, the percentage of patients with a complete malnutrition screening at admission within the 72 hours (weight (measured or estimated), height, as well as appetite or weight loss) was significantly higher in the intervention group (48.2% versus 27.0%). As shown by the relative benefit assessment between the baseline and the experimental period, the relative benefit ratio (R) was 2.13 for the complete admission screening. The weight was measured within 72 hours of admission for 69.4% of patients in the intervention group versus 58.7% in the control group (R1.60; p<0.001).

During the experimental period, patients of the intervention group received more artificial nutrition (enteral or parenteral) compared with the control group (17.4 vs 6.6%; p<0.001). Neither the mean number of parenteral nutrition days or parenteral nutrition bags per patient did differ significantly between both groups. A significant difference (p=0.004) was already present during the baseline period; nevertheless the difference was even more evident in the experimental period (R1.96).

The data of the artificial nutrition treatment are detailed in Table 4a. The percentage of patients with enteral nutrition prescribed did not differ between both groups during the baseline and the experimental period (3.1% vs 1.2% and 4.3% vs 4.2% respectively). In contrast, there were significantly more prescriptions for parenteral nutrition in the intervention group during the experimental period (13.5 versus 3.7%, p<0.001).

In 7% of the study population (137 patients), parenteral nutrition was administrated in the experimental period with respectively 98 patients in the intervention and 39 in the control group. Due to small features during baseline period, we limited the comparison of the biochemical monitoring to the experimental period. Triglycerides were measured at least once a week for 18.4% of patients of the intervention group vs 5.1% of the control group (p = 0.048), glycemia and extended serum electrolytes were more frequently measured in intervention group (77.6 vs 25.6%, p<0.001and 69.1 vs 41.0% , p= 0.002 respectively).

Table 2 Patient characteristics of the baseline and the experimental period

	Intervention group		Control group	
Total number of patients	N=290 (I0)	N=724 (I1)	N=406 (C0)	N=1060 (C1)
% male	58	56	59	65
% medical ward	34	36	46	47
% surgical ward	35	38	30	30
% mixed ward	31	26	24	23
Mean age (+/-SD)	64 +/-16	64+/-16	66+/13	65+/-14
Length of stay (+/- SD)	19 +/- 23	16+/-14	16+/18	15+/-13

Table 3 Results

Indicators	Baseline Period (%)			Experimental period (%)			Relative Benefit		
	C_0	I_0	p value	C_1	I_1	p value	C_1 / C_0	I_1 / I_0	R
Admission complete malnutrition screening	45.8	38.4	NS	27.0	48.2	<0.001	0.59	1.26	2.13
Admission weight (within 72 hours)	36.2	26.8	0.02	58.7	69.4	<0.001	1.62	2.59	1.60
Albumin dosage	45.6	68.4	<0.001	44.1	72.3	<0.001	0.97	1.06	1.10
Prealbumin dosage	11.7	22.2	<0.001	13.4	22.3	<0.001	1.14	1.00	0.87
Weight measure (performed at least once a week)	78.3	42.6	<0.001	78.0	45.9	<0.001	1.00	1.08	1.08
Artificial nutrition treatment	4.9	10.7	0.004	6.6	17.4	<0.001			
Enteral nutrition prescription	1.2	3.1	NS	4.2	4.3	NS			
Parenteral nutrition prescription	4.4	7.6	NS	3.7	13.5	<0.001			

* Numerical variables are expressed as means +/- standard deviations and were compared between intervention and control group by Wilcoxon rank sum test. Categorical variables were compared by chi-square test. We used relative benefit framework by comparing the ratio differences between the intervention (I1/I0) and the control groups (C1/C0) during the baseline and the experimental period.

Table 4a Artificial nutrition

	Baseline period			Experimental period		
	C_0	E_0		C_1	E_1	
Enteral nutrition	5 (1.2 %)	9 (3.1%)	0.004	44 (4.2%)	31(4.3%)	<0.001
Parenteral nutrition	18 (4.4%)	22 (7.6%)	NS	39 (3.7%)	98 (13.5%)	NS
Enteral and parenteral nutrition	3 (0.7%)	0 (0.0%)	NS	13 (1.2%)	3 (0.4%)	<0.001

Table 4b Quality of monitoring of parenteral nutrition

	Experimental period		
	$C_{1\ (n=39)}$	$E_{1\ (n=98)}$	p value
Triglycerides dosage (> or = once a week)	5.1%	18.4%	0.048
GOT dosage (> or = once a week)	59.0%	93.9%	<0.001
Glycaemia (during 3 first days of parenteral nutrition)	25.6%	77.6%	<0.001
Extended serum electrolytes including magnesium and phosphorus (> or = once a week)	41.0%	69.1%	0.002

Discussion

Despite the presence of a multidisciplinary nutrition committee for many years in our hospital, only one third of the inpatients were screened for malnutrition before the intervention was initiated. These observations have also been made by other authors, which is probably due to lack of awareness and a clear definition on responsibilities about organisation of clinical nutrition activities [6,12,13].

Despite an increased awareness over the last years in our hospital, height and weight measurements remained difficult. Similarly to other large surveys, one third of the patients could be weighed during this baseline period, although we observed that the estimated weights were higher than the measured ones [6,12,17]. Until guidelines were introduced in our hospital, the parental route seemed preferentially used for the administration of artificial nutrition and a lack of monitoring could be observed.

As clinical nutrition is often overlooked by physicians and nurses, we believe that patient-centred approaches on the ward are needed in addition to passive educational approaches. This proactive approach for the clinical pharmacist showed a significant increase of malnutrition screening at admission within the 72 hours and in the number of weights recorded. The relative benefit ratio (R) was respectively 2.13 for the screening fulfilled and 1.60 for the number of weights recorded.

In the experimental period, we observed an increase in the prescription of artificial nutrition in the intervention group. The intervention of the clinical pharmacist resulted in a significantly higher prescription of parenteral nutrition (Relative Benefit 2.11), while there was no change in the rate of prescription of enteral nutrition (Relative Benefit 0.4). The parenteral route might, however, have been overused.

Where some biochemical indices (e.g. extended electrolytes) were more monitored in the intervention group, the evidence about the benefit remains uncertain, as some of these indices could be monitored for other purposes (e.g. hepatic enzymes and glycaemia). In addition, the power to detect significant differences was probably insufficient due to the short length of follow-up. The compliance to guidelines on biochemical monitoring should be considered suboptimal, even in the intervention group.

Where a proactive approach on the ward will probably sensitize hospital frontline professionals, the presence of a nutrition team will probably be mandatory for a more specific education on the appropriateness and the prescription of artificial nutrition as well as to monitor the nutrition therapy to reduce the gap between evidence and clinical practice.

The present study has several limitations. First, the study was conducted in one centre and implemented by one healthcare professional, which may well limit the generalizability of the current findings. Second, there were important differences between the groups already after the baseline period. Randomisation at patient level, rather than at ward level, could have prevented this, but would have increased the risk of contamination bias. Third, the appropriateness of prescription of artificial nutrition could not be evaluated.

Conclusion

In conclusion, moving from a passive to a more active approach contributed to better sensitization of the hospital frontline professionals resulting in a better screening at admission within the 72 hours and the increased recording of weight and heights. Parenteral nutrition was more frequently prescribed, which may question the appropriateness of the route of artificial nutrition. Biochemical monitoring remained suboptimal. Even if this more proactive approach increases the awareness of the hospital frontline professionals, there is a need for a more tailored approach with specific service level agreements as well as the availability of Nutrition Support Teams providing specific advice on the wards. The latter will also increase the appropriateness of the prescription and route (enteral versus parenteral) of the artificial nutrition and provide a more efficient biochemical monitoring. The current study is advanced as a direct initial contribution to the development of more person-centered approaches in the prevention and management of hospital malnutrition.

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