CLINICAL PHARMACIST INTERVENTIONS ON PARENTERAL NUTRITION APPROPRIATENESS IN A TEACHING HOSPITAL

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INTRODUCTION AND OBJECTIVE

- Malnutrition has been shown to be associated with higher mortality and morbidity, prolonged recovery from illness and length of stay (LOS).
- Total parenteral nutrition (TPN) isn't always prescribed according to international guidelines: nutritional screening is frequently lacking, the prescribed therapy is not always adapted accordingly and subsequent monitoring is often absent.
- Our objective was to assess the potential benefit of a clinical pharmacist evaluating the appropriateness of the TPN-prescriptions.

METHODS

Setting

- *prospective pre-post intervention study in a tertiary care teaching hospital*
- *Inclusion criteria: adult hospitalized patients (≥18 years) on TPN*

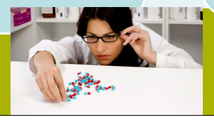
Collected data

- *presence of NRS2002*-screening*
- *total energy expenditure (TEE in kcal)*
- *indication*
- *therapy appropriateness and duration*
- *patient characteristics (gender, age, BMI)*
- *all data were obtained from the electronic patients files and by contacting the ward*

** Nutritional Risk Screening 2002*

Clinical pharmacist

- *therapy was assessed*
- *the ESPEN guidelines were taken as gold standard*
- *data were analyzed using SPSS 20.0 and collected in a personalized MS Access ® database*



Physician

- *feedback was provided to the physician and dietician in multidisciplinary collaboration (only during the intervention period)*

RESULTS

1. Patient characteristics

- We assessed 272 hospitalizations: 152 pre-interventional (10/2013 – 01/2014) and 120 during the intervention period (02/2014 – 04/2014).
- Both patient groups were comparable *(table 1).*

***Table 1.** Patient characteristics*

	Pre-interventional n = 152	Intervention period n = 120	p-value
Gender – male	94 (61.8%)	70 (58.3%)	0.56*
Average age (years)	64.9 (SD[1] = 15.7)	64.1 jaar (SD = 16.3)	0.77**
Average BMI (kg/m²)	25.0 (SD = 5.5)	24.7 (SD = 5.8)	0.68**
Average NRS-2002	3.9 (SD = 1.1)	4.1 (SD = 0.9)	0.46**
Average total energy expenditure (kcal/day)	1929.4 (SD = 395.1)	1913.0 (SD = 426.9)	0.75**

**Chi²-test ; **t-test; [1]standard deviation*

2. Type of interventions

- During the intervention period 176 interventions were proposed of which 168 (95.5%) were accepted *(table 2).*
- Avoidance of the preparation (46.0%), calculation of the energy requirement (17.6%) and completion of the NRS2002 (15.9%) were the most frequently proposed interventions.

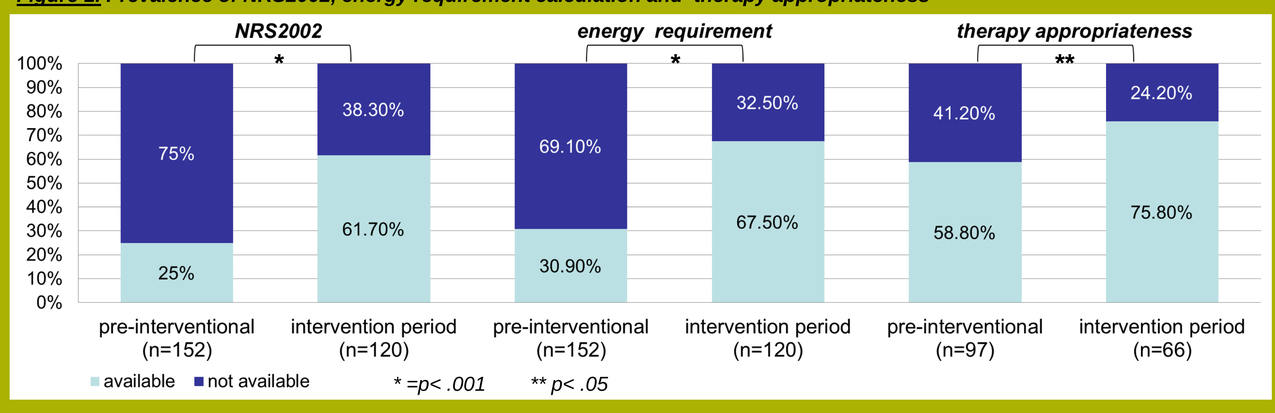
***Table 2.** Type of interventions*

Type of interventions	Number proposed (% of total)	Number not accepted
Avoidance of the preparation	81 (46.0%)	0
Calculation of the energy requirement	31 (17.6%)	1
Completion of the NRS2002	28 (15.9%)	1
Prescription of another TPN	21 (11.9%)	0
No correct indication	8 (4.5%)	6
Start of enteral nutrition (combination)	5 (2.8%)	0
Drug-drug interaction (Ceftriaxon®)	2 (1.1%)	0
Total	176	8

3. Impact on clinical practice

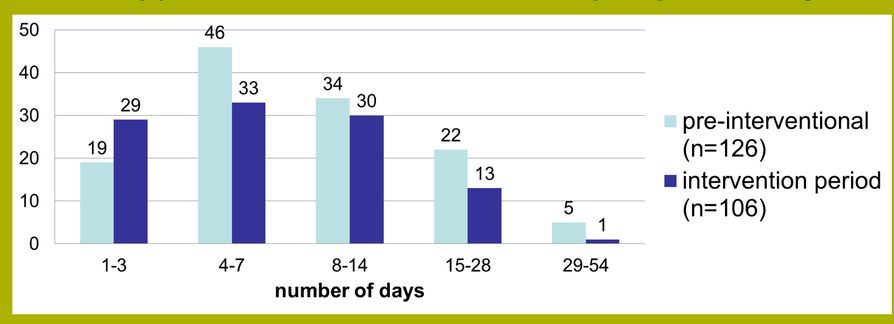
- Prevalence of NRS2002 increased from 25.0% to 61.7% as did energy requirement calculation (30.9% vs. 67.5%) during the intervention period (both $p<.001$) *(figure 1).*
- Therapy appropriateness increased from 58.8% to 75.8% ($p< .05$) *(figure 1).*

***Figure 1.** Prevalence of NRS2002, energy requirement calculation and therapy appropriateness*



- We saw a reduction of the median (7 vs. 6 days) and average duration (10.2 vs. 8.3 days) of the therapy but this wasn't statistically significant ($p= .36$) *(figure 2).*

***Figure 2.** Therapy duration*



4. Financial impact

- **Directly**, we could avoid the production of 81 TPN's by increased follow-up of TPN administration on the ward.
- **Additionally**, by increasing the use of enteral feeding and lowering therapy duration, due to the intensive monitoring by the clinical pharmacist, an estimated saving of at least 50.000 €/year could be obtained.
- **Finally**, a better registration of the patients nutritional status has a positive effect on the hospital financing by the Belgian government.

CONCLUSION

- The additional monitoring of the TPN appropriateness by a clinical pharmacist, in multidisciplinary collaboration, has a positive influence on therapy quality and healthcare costs and can help to reduce the complications of parenteral nutrition.
- Additionally, the pharmacist can also perform other tasks e.g. the facilitation and promotion of home-TPN, follow-up of concomitant drug therapies, the detection of interactions and incompatibilities, improvement of the (TPN-) prescribing system etc.
- The impact of the clinical pharmacist can be further enhanced by optimizing the electronic patient files and by developing and implementing clinical guidelines in the hospital.

REFERENCES

(1) ESPEN guidelines (http://www.espen.org/education/espen-guidelines)
(2) Nutrition support team UZ Brussel

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