Clinical Nutrition ESPEN xxx (2017) e1–e5

Contents lists available at ScienceDirect

Clinical Nutrition ESPEN

journal homepage: http://www.clinicalnutritionespen.com

Original article

Appropriateness of peripheral parenteral nutrition use in adult patients at an academic medical center

David Sugrue [a, *], Andrew S. Jarrell [a], Rachel Kruer [a], Stephanie Davis [a], Dachelle Johnson [b], Evelyn Tsui [c], Sukyee Snyder [d], Jessica Crow [a]

[a] Department of Pharmacy, The Johns Hopkins Hospital, 600 North Wolfe Street, Carnegie Bldg Room 180, Baltimore, MD 21287, USA
[b] Clinical Center Pharmacy Department, National Institutes of Health, 10 Center Drive, Room 1C240, Bethesda, MD 20892, USA
[c] Department of Clinical Nutrition, The Johns Hopkins Hospital, 600 North Wolfe Street, Baltimore, MD 21287, USA
[d] Department of Nutrition, Holy Cross Hospital, 1500 Forest Glen Rd, Silver Spring, MD 20910, USA

ARTICLE INFO

Article history:
Received 10 November 2017
Accepted 20 November 2017

Keywords:
Parenteral nutrition
Peripheral
Utilization
Appropriateness

SUMMARY

Background & aims: Current evidence and guidelines identify patient populations who may benefit from parenteral nutrition. Peripheral parenteral nutrition (PPN) may be indicated for a subset of patients; however, PPN therapy carries a risk of associated adverse effects. The purpose of this project was to assess appropriateness of current PPN prescribing practices at an academic medical center to determine whether additional guidance and oversight may be beneficial.
Methods: Adult patients admitted from August 1, 2015 to November 30, 2015 with at least one order of PPN administered were included. PPN use was evaluated for appropriateness using definitions derived from clinical practice guidelines and standard of practice. Adverse events, including phlebitis and bacteremia, were also examined.
Results: Of the 159 patients included, 51 (32.1%) received appropriate PPN therapy, in which all four criteria for appropriateness were met. In regards to the criteria for appropriateness, 128 (80.5%) had an appropriate indication, 85 (53.5%) had appropriate time to PPN initiation, 157 (98.7%) had an appropriate duration of therapy, and 112 (70.4%) achieved an appropriate percentage of goal daily calories. In terms of complications associated with PPN therapy, 69 (43.4%) patients had documented phlebitis and bacteremia occurred in 5 (3.1%) of the patients.
Conclusion: During the study period, PPN was appropriately utilized in only one-third of patients and phlebitis occurred in almost half of all patients. Restrictions on PPN prescribing may allow nutrition support clinicians to prospectively evaluate patients to optimize nutrition therapy and minimize the incidence of inappropriate PPN use.
Published by Elsevier Ltd on behalf of European Society for Clinical Nutrition and Metabolism.

1. Introduction

Acute illness is associated with a catabolic stress state in which patients demonstrate a systemic inflammatory response [1]. Nutrition therapy attenuates the metabolic response to stress, prevents oxidative cellular injury, and favorably modulates the immune response. Protein-calorie malnutrition before and during hospitalization has been associated with increased morbidity and mortality and the incidence of malnutrition worsens over time for patients who require prolonged hospitalization [2].

When feasible, enteral nutrition (EN) is preferred over parenteral nutrition (PN) due to decreased cost, physiologic delivery of nutrients, and an association with fewer infections [3]. However, adequate EN provision is not always feasible. Conditions in which EN may be contraindicated include massive small-bowel resection affecting nutrient absorption, proximal high-output fistulae, partial or complete small bowel obstruction, and severe gastrointestinal bleeding [4]. Recent consensus recommendations from the American Society of Parenteral Nutrition (ASPEN) and joint guidelines from the Society of Critical Care Medicine (SCCM) and ASPEN have identified patient populations who clinically benefit from PN [3,5].

* Corresponding author. Carilion Roanoke Memorial Hospital, Department of Pharmacy, 1906 Belleview Avenue, Roanoke, VA 24014, USA.
E-mail addresses: dsugrue09@gmail.com (D. Sugrue), andrewj@jhmi.edu (A.S. Jarrell), rkruer1@jhmi.edu (R. Kruer), sdavis87@jhmi.edu (S. Davis), dachelle.johnson@nih.gov (D. Johnson), evelynotsui@gmail.com (E. Tsui), sukyee.or@gmail.com (S. Snyder), jcrow3@jhmi.edu (J. Crow).

https://doi.org/10.1016/j.clnesp.2017.11.004
2405-4577/Published by Elsevier Ltd on behalf of European Society for Clinical Nutrition and Metabolism.

While the appropriate time to initiate PN remains controversial, these documents provide recommendations on the timing of initiation of PN in patients unable to receive adequate EN based on the presence of malnutrition and whether patients are undergoing major upper gastrointestinal surgery [3,5].

PN can be provided via a central or peripheral vein. Peripheral parenteral nutrition (PPN) is often used when central venous access is not possible or has not yet been obtained. The use of PPN may prevent delays in establishing nutrition support since access is relatively simple to obtain with no need for radiographic confirmation of a catheter tip. Other potential benefits of PPN include the avoidance of the associated costs for central venous catheter (CVC) device placement and maintenance of the indwelling catheter [6].

PPN may be indicated for a subset of patients, but must be weighed against the risk of associated adverse effects. Due to the hyperosmolar nature of PN formulations, use of PPN requires careful consideration of solution osmolarity and monitoring for signs of phlebitis [7]. Since PPN solutions cannot be highly concentrated, large volumes are often required to meet nutrient goals. Patients with cardiac, renal, or hepatic dysfunction often are fluid-restricted and may be unable to reach caloric goals with PPN. The amount of electrolytes added to PPN must also be limited in order to maintain acceptable osmolarity, which can lead to electrolyte disorders and the need to administer electrolytes separately from the PPN infusion [7].

At The Johns Hopkins Hospital, central parenteral nutrition (CPN) requires approval from the nutrition support service in the adult non-oncology population. This process allows the opportunity for a dietitian to prospectively evaluate appropriateness of CPN, determine macronutrient goals, and provide recommendations for micronutrients and electrolytes. This process currently does not exist for PPN. The purpose of this project was to assess the appropriateness of current institutional PPN prescribing practices and to determine whether additional oversight of PPN use by nutrition support clinicians may be necessary.

2. Materials & methods

This was a single-center, retrospective cohort study approved by the institutional review board at The Johns Hopkins Hospital in Baltimore, MD. Patients were included if they were adults who were admitted to The Johns Hopkins Hospital and received PPN between August 1, 2015 and November 31, 2015. Medical oncology patients were excluded as PPN orders are prospectively evaluated by a dietitian in this population.

Patients who received PPN therapy during their admission were identified by reports generated in the Central Admixture Pharmacy Services (CAPS®) database. Administration of the ordered PPN was confirmed via the electronic medication administration record. Medical records were reviewed for demographic data, medical service, location of patient at the time PPN was initiated, duration of PPN therapy, indication for PPN therapy, and timing of PPN initiation. Malnutrition and daily goal calories were collected as documented by dietitian assessment. When documentation was lacking, two study team members independently reviewed patients to determine indication and nutritional status. Cases in which the independent reviewers did not agree on indication and nutritional status were adjudicated by the entire study team for consensus. Patients received individualized PPN 3-in-1 admixtures with added micronutrients as allowed to maintain an osmolarity less than or equal to 900 mOsm.

Four criteria were used to determine appropriateness of PPN use: indication, time to initiation, duration of therapy, and percent of goal calories achieved. Details of these criteria are listed in Table 1. Definitions for appropriateness were derived from clinical practice guidelines and standard of practice. If the patient was not assessed by a dietitian during the hospitalization, nutritional status and daily goal calories were determined retrospectively utilizing the NUTRIC Score [11]. Body mass index (BMI) was utilized to assess for malnutrition; both BMI and intensive care unit (ICU) admission status were taken into consideration when calculating daily goal nutrition calories.

The presence of phlebitis was determined by nursing staff documentation in the electronic medical record. Bacteremia was defined as any new positive blood culture resulting after PPN initiation or up to three days after discontinuation. If the pathogen was identified as coagulase-negative staphylococci, two positive blood cultures were required to confirm diagnosis.

The primary endpoint was appropriateness of PPN as defined by the ASPEN-SCCM guidelines and standard of practice [3]. Secondary endpoints included rate of aforementioned appropriateness for each criterion of PPN use, prescribing patterns of PPN therapy, and adverse effects and complications of PPN use.

Descriptive statistics were used to represent the primary and secondary objectives. The Wilcoxon Rank–Sum test was used for continuous variables and chi square test for categorical data. All analyses were performed using STATA Statistical Software, version 13 (Stata Corp LP, College Station TX, USA).

3. Results

We identified 159 patients during the study period that received at least one infusion of PPN. The characteristics of the study population, including a comparison of patients with appropriate vs. inappropriate PPN use, are described in Table 2. Overall, patients had a median age of 63 (IQR 19) years, 58.5% were male, and the majority were surgical patients (66.7%).

Table 1
Criteria for appropriate PPN use.

Indication	Documented acceptable contraindication to enteral nutrition, including: • Ileus • Delayed gastric emptying • Severe gastrointestinal bleed • Intractable vomiting and/or diarrhea refractory to medical management • Anastomotic leak • Chyle leak • Fistula • Bowel ischemia • Small bowel obstruction • High ostomy output • Severe short-bowel syndrome (<100 cm of small bowel remaining) • Pancreatitis • Hemodynamic instability requiring vasopressors • Unable to obtain enteral access
Time to initiation	• Patients with no evidence of malnutrition: PN initiated no sooner than day 7 of being NPO • Patients undergoing major upper GI surgery, with no evidence of malnutrition: PN initiated no sooner than POD 5 • Patients with documented malnutrition: PN could be initiated as soon as EN not feasible
Duration	Duration of PPN therapy < 14 days
Calories Achieved	• Patients receiving PN ≥ 3 days able to achieve > 60% of goal daily calories • If PN use < 3 days, calories achieved on last day of PN therapy were collected

EN, enteral nutrition; GI, gastrointestinal; NPO, nothing by mouth; PN, parenteral nutrition; PPN, peripheral parenteral nutrition; POD, post-op day.

Please cite this article in press as: Sugrue D, et al., Appropriateness of peripheral parenteral nutrition use in adult patients at an academic medical center, Clinical Nutrition ESPEN (2017), https://doi.org/10.1016/j.clnesp.2017.11.004

Download English Version:

https://daneshyari.com/en/article/8587484

Download Persian Version:

https://daneshyari.com/article/8587484

Daneshyari.com