Identification and Early Treatment of Dehydration in Home Parenteral Nutrition and Home Intravenous Fluid Patients Prevents Hospital Admissions

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Introduction: There are multiple methods to assess hydration status including changes in weight, labs, vital signs, fluid intake and output (I/O), and physical signs. Early identification and treatment of dehydration is prudent in patients requiring home parenteral nutrition (HPN) or home intravenous fluids (HIVF). Our home nutrition support service (HNS) developed a protocol to provide additional bags of HIVF to be kept on-hand for immediate use in those patients identified at risk of developing dehydration (e.g., high output ostomy, fistula, drain) to avoid emergency room (ER) treatment or hospital admission. Prior to discharge patients are instructed on signs and symptoms of dehydration and when to contact the HNS service if present. No studies have evaluated the frequency or patient characteristics associated with dehydration, or the effectiveness of treatment in the home setting in this population.
Methods: A retrospective review was performed on all HPN and HIVF patients from a clinical database who received additional HIVF during 2010. Data collected included demographics, primary diagnoses, HPN/HIVF indication, presence of a fistula or ostomy, labs (Na, Cl, BUN, Cr), patient or clinician identification of dehydration, vital signs, physical signs (e.g., decrease in weight, lightheadedness, decreased or darker in color urine, increased ostomy output, excessive thirst, cramping in extremities), I/O data, dates of ER visits or hospital admission for dehydration, and compliance with infusion orders. Dehydration was defined as having a negative fluid balance on I/O records with at least one physical symptom and/or alteration in labs compared to baseline. Descriptive statistics were computed for all factors. Standard treatment was 1000mL HIVF daily for 3 days in addition to prescribed infusions. Dehydration was considered resolved as determined by normal labs drawn at completion of HIVF infusions and/or resolution of physical symptoms.
Results: Of 308 HNS patients serviced during 2010**,** additional HIVFs were ordered in161 patients to be kept on hand for immediate use to treat dehydration. The most common diagnoses were Crohn's disease and cancer with malabsorption, fistula, or obstruction. 100% of HIVF and 65% of HPN patients had an ostomy. Of the 161 patients, 63% (n=102) required additional HIVF. Of the 102 patients treated with additional HIVF, 201 episodes of dehydration were recorded. Patients had between 1 to 8 episodes of dehydration; with a median of 1 episode (52% had 1 episode). For every five-year increase in age, the odds of having more than one dehydration episode increased 20% (OR 1.2). Increased ostomy output (p=0.021), negative I/O data (p=0.014), and age (0.021) were predictors of multiple dehydration episodes. Patients receiving HIVF were more likely than HPN patients to have increased ostomy output (73% vs. 32%, p=0.008) and become hypotensive (27% vs. 7%, p=0.022)**.** I/O data was consistent with signs and symptoms of dehydration 80% of the time. 170 episodes (84.5%) of dehydration were successfully treated at home compared to 9 ER admissions (4.5%) and 22 hospital admissions for dehydration (11%). Sixteen patients had 22 admissions for dehydration, with 1 patient having 4 dehydration admissions due to non-compliance.
Conclusion: Dehydration is common in HPN/HIVF patients, especially those with malabsorption and an ostomy. We show 84.5% of episodes of dehydration successfully treated in the home in patients initially identified at risk by our protocol. Education of patients at risk of dehydration prior to discharge and providing additional HIVFs on hand for immediate use can reduce the incidence of ER treatment or hospitalization and potentially save health care costs.