Short Communication

Impact of Pharmacist Intervention in the Management of Intravenous to Subcutaneous Insulin Transition

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ABOUT THE STUDY

Glycemic management is a critical aspect of patient care, and numerous studies suggest that hyperglycemia has been linked to poor inpatient outcomes such as infection, prolonged hospital stay, disability after discharge, and death [1]. Patients with Blood Glucose (BG) levels >198 mg/dL at admission were associated with higher risk of mortality. Currently, the American Diabetes Association (ADA) recommends a glycemic target of 140-180 mg/dL in the majority of non-critically ill patients with a more stringent goal of 110-140 mg/dL as an option in selected patients without significant hypoglycemic risks. Computer based algorithms for delivery of intravenous insulin such as the Glucommander® program support beneficial outcomes associated with reducing BG variability and episodes of hypoglycemia, especially during hyperglycemic crises such as diabetic ketoacidosis or hyperosmolar hyperglycemic state when strict glycemic control is desired [2].

Insulin infusion can be used for hospitalized patients with or without diabetes for the management of uncontrolled hyperglycemia, enabling safe and adjustable doses to be administered continuously with the ultimate goal of transitioning to subcutaneous insulin based on the institutions recommended protocol. The intravenous to subcutaneous transition is a critical time to frequently assess insulin requirements that can change based on clinical factors such as stress, infection, diet, and medication [3]. In order to prevent hypoglycemia or hyperglycemia, close monitoring of BG with appropriate dose adjustments of subcutaneous insulin is warranted.

Although computer based insulin infusion algorithms have many benefits, there are also potential challenges. During the transition of intravenous to subcutaneous insulin, healthcare providers may be uncertain how to leverage the technology and institutional guidance when selecting an appropriate insulin regimen. To help prevent errors, clinical pharmacists can play a key role in providing education and serving as a resource to providers and nurses [4]. One study found that a pharmacist-led glycemic control team for surgical inpatients admitted to the post-anesthesia care unit increased the rate of goal BG 70-180 mg/dL, decreased hypoglycemia defined as BG <70 mg/dL, and reduced post discharge medical costs. These findings suggest that a clinical pharmacist's expanded scope of practice in glycemic management may contribute to improved outcomes. Methods of transitioning intravenous insulin infusion algorithms to subcutaneous regimens have not been validated in non-critically ill patients. Additionally, some research suggests improved outcomes with clinical pharmacist-led multidisciplinary approach in glycemic management.

Glucommander® insulin infusion is being utilized in an effort to increase the rate of BG within target ranges in both critically and non-critically ill patients due to its simplicity, safety, and efficacy [5]. However, a definitive and universal method for intravenous to subcutaneous insulin transition does not exist, especially for non-critically ill patients due to limited literature. Although transition protocols may be institution specific, the results of this study indicate the positive impact of proactive and real-time pharmacist review of transitions as evidenced by the higher percent of BG within the goal range in the post intervention group. The most common pharmacist interventions were recommending subcutaneous insulin regimen and or facilitating the 2-hour overlap of continuing intravenous insulin after the first dose of subcutaneous long-acting insulin.

CONCLUSION

The rates of BG values within goal range also indicate the need for further improvement, which could be addressed by expanded clinical pharmacists scope of practice for glycemic management during and following the transition period. Similar protocol driven programs could be incorporated in other clinical settings and institutions to improve glycemic control. Furthermore, follow-up studies reviewing the most effective intravenous to subcutaneous insulin transition method may also be beneficial.

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