2021 ANNA NATIONAL SYMPOSIUM

Obtaining Hemoglobin S and Hematocrit Levels Post Red Blood Cell Exchange: Target and Actual Result

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Problem: Red blood cell exchange (RCE) is performed in various indications for sickle cell disease. Hemoglobin electrophoresis (HgbS) in conjunction with obtaining hematocrit (hct) levels post exchange via Complete Blood Count (CBC) has been used as a standard practice to determine the efficacy of the procedure without increasing blood viscosity. Our current unit policy requires obtaining pre HgbS and CBC but doesn't require the same labs to be drawn post red blood cell exchange. With only the targeted hgbS and hct levels available, absence of actual results questions the quality and efficacy of the exchange. There is no actual numerical data to compare with targeted levels having clinicians wonder if targeted goals are being met as part of the unit's quality indicators.

Objective: This Quality Improvement project seeks to determine if obtaining hgbS and hct levels post Red blood cell exchange provide accurate measurement of predicted levels and aid clinicians in assessing the efficacy of the exchange in correlation with improvement of symptoms.

Sample: The project comprised of 7 sickle cell disease patients, both male and female, 30 years and older requiring chronic red blood cell exchange as part of their treatment maintenance every 4-6 weeks in our outpatient apheresis unit.

Methods: Evidence review were conducted and various literatures support the practice of obtaining hgbS/hct levels post red blood cell exchange. After revision of our current policy, the Apheresis nurses tracked post hgbS levels and CBC of 7 outpatients to see if recommended targets are being attained for 5 months. Results were presented by using a bar graph.

Results: During 5 months, 35 RCE procedures were done on the selected patients and mean post hgbS levels and CBC were drawn every post RCE and results were tracked (See figure). Based on the results, all levels are within the targeted hgbS levels at <30% which is in compliance with the current treatment guidelines. By performing RCE, it can maintain a low hgbS%, and if hgbS% is maintained below 30% hemoglobin can safely be maintained at a higher level with less risk of hyperviscosity (Howard J, 2016).

Conclusion/Implications: The project gave way to change our current policy and apply it to our practice. By having an actual data on hand, apheresis nurses can optimize the use of RCE and patients can return for their next appointment as directed by their referring hematologist (usually between 4-6 weeks). The numerical data obtained post RCE aids clinicians in assessing the effectivity of exchange in correlation with symptom improvement experienced by the patient (Mandal et. al, 2014). The practice change will also be implemented to our inpatient sickle cell population requiring acute RCE.

Abstract selected for presentation at 2021 ANNA National Symposium