Severity of Preoperative Anemia In Elective Intracranial Neurosurgical Procedures On Postoperative Outcomes

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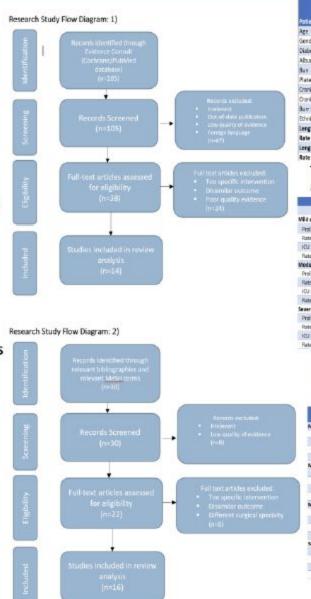
Background

Anemia is a highly prevalent disease that has been correlated to worsening outcomes. Anemia becomes increasingly concerning in the oxygenation and tissue repair of damaged tissue, such as after surgery, or in highly aerobic tissues, such as the heart and brain. In a wide range of different surgical patients and specialties, preoperative anemia has been associated with worsening outcomes of patient mortality and morbidity. Neurosurgical procedures, including both spine and intracranial, too have been associated with worsening postoperative outcomes related to preoperative anemia.

We seek out to find a dose-dependent relationship between differing preoperative anemia and worsening postoperative outcomes in elective intracranial neurosurgical procedures. Furthermore, we also seek out to find this same relationship as it differs between each procedure type.

Literature Review

Literature review flow diagram attached to the right. Records were identified through two methods, Cochrane/PubMed review and MeSH headers. Abstracts then screened and assessed for eligibility. Full-test articles were assessed and a total of 30 articles were included in literature review.



Patient Demographics		Mild Anemia(11.0-12.0 g/dt for mon and 11.0-12.0 g/dt for women)		Moderate Anemia(\$.0-11.0 Severe Anemia(<\$.0g/dLinmen a g/fLinmen and women) women)		
Age	55 √-14.6	59.4 4/- 12.3	P value < 0.05			
Gen der						
Olabetes						
Albumin						
3ut						
Platelet						
Craniatomy	48 (20.2%)	63 (35%)	Fivalue < 0.05			
Craniotmy he metorna						
Bur hole						
Ethylicity						
Length of postop stay (he	24 +/3	424/6	2 value < 0.05			
Rate of readmission	14 (5.2%)	22(9.5%)	Pivalue < 0.05			
Length in ICU						
Rate of blood transfusion	1					

Table 1: Mock Patient Demographics table with bivariate analysis of significant P value < 0.05

	Univariable Regression			Multivariable N	ariable Regression	
	Odds Ratio	95% Confidence Interval	P Value	Odds Ratio	95% Confidence Incorval	P.Value
Mild anemia						
Prolonged LOS		181423	<0.05		15 12 14	4.55
Rate of Rendmission						
ICU Stay						
Rate of Blood transfusi	ion					
Moderats anomia						
Prefenged LDS		141830	,0.05		11.625	-0.05
Rate of Readmission						
ICU Stay						
Rate of Blood translusi	on					
Severe anemia						
Prolonged LDS		122340	<0.05		23 25-15	425
Rate of Rendmentor						
1CU Stay						
Rate of Blood translusi	on					

Table 2: Mock Univariable/Multivariable Regression table expressing Odds Ratios of primary outcomes in differing anemia levels.

	Cranistony !	for turner minimie	n Crariiotes	my for hematoma	Burr Hole	Cranitomy
No anemia						
105	25+/-6		21+/-2		36+/-5	23+/-6
Rate of readmission	4(12%)		0(0%)		6(34%)	1(2%)
Dengili In ICU						
Rate of Blood Translation	10					
Mild anerria						
105	20-/-6	P value < 0.05	24+/-5	P value +0.05		
Rate of readmissions						
Length in ICU						
Rote of Blood Transfusion						
Moderate anemia						
LOS						
Rate of readmission						
Length in ICU						
Rate of Blood Translation	101					
Severe anemia						
1.05						
Rate of readmission						
Length in ICU						
Rate of Blood Transfusion						

Table 3: Mock Table comparing primary outcomes in anemic levels stratified against procedural type.

Methods

- A retrospective observational study including registry patients from an
 electronic health record database(PSHMC) of adult patients undergoing
 elective intracranial neurosurgical procedures from 2015-2019. Exclusion
 criteria: emergent/trauma related procedures, age <18 years, spinal
 procedures.
- Patients categorized into 4 groups: no anemia(<13.0g/dL for men and <12.0g/dL for women), mild anemia(Hgb levels of 11.0-13.0 g/dL for men and 11.0-12.0 g/dL for women), moderate anemia (Hgb levels of 8.0-11.0 g/dL in men and women), severe anemia (Hgb levels of <8.0g/dL in men and women).</p>
- Demographics and study variables undergoing univariate analysis, group differences explored using bivariate analysis. Confounding variables controlled via a multivariable regression model, using a forward-step wise approach, preoperative factors found in the literature or bivariate analysis were included.
- Stratification included categorizing anemic levels into different neurosurgical procedures.
- Sensitivity analysis performed excluding patients who receive perioperative RBC blood transfusion.
- Primary outcome is length of postoperative stay, strengthened by secondary outcomes of length of ICU stay, rate of readmission, and rate of blood transfusion

Expected Contribution

Currently, in the neurosurgical subspecialty, it is unknown what the relationship between differing severity of preoperative anemia is to postsurgical outcomes of to length of hospital and ICU stay, rate of readmission, and perioperative blood transfusion. This study expects to provide observational evidence on the relation between differing anemic levels and postoperative outcomes to inform clinical practice in regard to preoperative and postoperative treatment in patients with anemia.

**disclaimer: Unfortunately due to COVID and related circumstances, we are still gathering and completing the provisioning and collection of the data. This poster will instead break down literature review and future methods and design, including 'mock tables' for presentation purposes.