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**Bleeding Disorder Referrals to Hematology Clinic: A Single Institution Experience**

Zuri Hudson

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Bleeding Disorder Referrals to Hematology Clinic: A Single Institution Experience

Zuri Hudson, DO PGY2
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Bleeding Disorder Referrals

• Retrospective chart review was utilized to characterize hematology referrals for bleeding disorder evaluation
• Of 373 subjects, 40 (11%) were diagnosed with a bleeding disorder with 21 (6%) being diagnosed with von Willebrand disease
• 9% of Otolaryngology referrals compared with 15% of Primary Care resulted in a bleeding disorder diagnosis
Outline

• Background
• Objectives
• Methods/Design
• Results
• Conclusion
• Summary
Bleeding Disorder Diagnosis

• A 2014 study showed that 4% of patients referred to hematology based on a preoperative coagulation evaluation had a clinically relevant bleeding disorder
Bleeding Disorder Evaluation

- Mild bleeding symptoms are common in the general population and have been reported in 25-40% of healthy individuals.
- Evaluations can be time consuming and costly, often requiring multiple visits for stepwise laboratory testing.
Pre-Operative Screening

• Various studies of routine preoperative testing in the prediction of operative hemorrhage in adenotonsillectomy have shown abnormal screening labs are common in the healthy population, ranging from 2% to 4%

• Burk et al prospectively evaluated 1603 children undergoing tonsillectomy; 31 children had initial laboratory abnormalities with 2% of the population had post-operative bleeding
Standardized Bleeding Assessment Tools

• International Society on Thrombosis and Haemostasis bleeding assessment tool ISTH BAT has high sensitivity and negative predictive value for bleeding disorders that makes it suitable as a screening tool, but it has not been shown to be able to predict future bleeding events
Purpose

- To characterize our hematology referrals for bleeding disorder work up
- To describe the diagnostic outcomes from these referrals
- To estimate the proportion of bleeding disorders diagnosed from these referrals
- To identify referral factors that are associated with being diagnosed with a bleeding disorder
Design

• Patients referred and/or seen for a bleeding disorder evaluation at Children’s Mercy Hospital from 07/1/2018 until 06/30/19 were evaluated for demographics, reason for consultation, referring provider, and outcome of referral.

• Each eligible subject’s electronic health record (EHR) was accessed and reviewed to collect study-related information compiled within RedCap.
### Population Characteristics

**Total n = 373**

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Count (Percentage)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age (years) mean (SD)</strong></td>
<td>8.3 (8.4)</td>
</tr>
<tr>
<td><strong>Gender, n (%)</strong></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>210 (56.3)</td>
</tr>
<tr>
<td><strong>Race/Ethnicity, n (%)</strong></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>256 (68.6)</td>
</tr>
<tr>
<td>Black</td>
<td>69 (18.5)</td>
</tr>
<tr>
<td>Hispanic</td>
<td>52 (13.9)</td>
</tr>
<tr>
<td>Other/Unknown Race</td>
<td>4 (1.1)</td>
</tr>
<tr>
<td>Native American</td>
<td>4 (1.1)</td>
</tr>
<tr>
<td>Asian</td>
<td>4 (1.1)</td>
</tr>
<tr>
<td>Pacific Islander</td>
<td>2 (0.5)</td>
</tr>
</tbody>
</table>

- 20 subjects had work up still in progress at the time of data collection
- 7 subjects were seen but lost to follow up prior to diagnosis
- 29 cancelled or did not show for appointments
Symptoms (Bleeding or bruising) 38%
Pre-Operative Clearance 27%
Family History 24%
Abnormal Lab Values 11%
REFERRAL REASON
Referring Specialties

- Dentist: 0
- Emergency/Urgent Care: 5
- ENT: 16
- Gynecology: 16
- Hospitalist/Inpatient: 8
- Neonatology: 8
- Neurology: 2
- Neonatologist: 8
- Primary Care: 94
- Surgery: 48
- Other Sub-specialty: 12
- Self/Family Referral: 12
- Other Sub-specialties: 48
Bleeding Disorder Diagnosis: Referring Specialties

• 40% (164/373) of the referrals were from Otolaryngology (ENT), 30% (112/373) from primary care, and 27% from other specialties

• Of those referred from Otolaryngology and Primary Care (Adolescent Medicine and Gynecology):
  • 9% (15/164) were diagnosed from ENT
  • 15% (17/112) were diagnosed from primary care
Bleeding Disorder Diagnosis

• Of our referred patient sample:
  • 6% (21/373) were diagnosed with von Willebrand disease
  • 4% (14/373) were diagnosed with a platelet function disorder
  • 1.3% (4/373) were diagnosed with a factor deficiency

• The median number of days between referral and appointment was 31.5 days with a median of 2 [1-5] total visits including clinic and laboratory visit for a clinical diagnosis
## Logistic Regression

<table>
<thead>
<tr>
<th>Predictors</th>
<th>Odds Ratio</th>
<th>95% CI</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>0.92</td>
<td>0.85 – 0.99</td>
<td>0.038</td>
</tr>
<tr>
<td>Gender [Male vs. female]</td>
<td>1.75</td>
<td>0.82 – 3.83</td>
<td>0.151</td>
</tr>
<tr>
<td>Ref Reason: Pre-operative clearance [Yes vs. No]</td>
<td>0.51</td>
<td>0.23 – 1.09</td>
<td>0.088</td>
</tr>
<tr>
<td>Referral Reason: Abnormal Labs [Yes vs. No]</td>
<td>3.03</td>
<td>1.29 – 6.98</td>
<td>0.010</td>
</tr>
<tr>
<td>Treatment: Nasal Cauterization [Yes vs. No]</td>
<td>2.86</td>
<td>0.82 – 8.82</td>
<td>0.078</td>
</tr>
</tbody>
</table>
Bleeding Disorder Diagnosis: Referral Patterns

• 11% of subjects in this study were diagnosed with a bleeding disorder
• This coincides with rates of bleeding disorders within the general population
  • 1 in 1,000 people have von Willebrand disease
  • With this prevalence, our study’s 21 out of 373 subjects (6%) is reasonable
Bleeding Disorder Diagnosis: Referral Factors

• Certain referral factors including age and abnormal laboratory values had a significant p value
• 35% (14/40) were diagnosed with a bleeding disorder with at least one abnormal coagulation test
  • Shaw et al demonstrated 19% (9/48) prevalence of a bleeding disorder in pediatric patients with abnormal screening coagulations tests.
Bleeding Disorder: Referring Specialties

• 9% of Otolaryngology referrals compared with 15% of Primary Care resulted in a bleeding disorder diagnosis indicating higher screening positivity from primary care.

• The utility of bleeding histories has previously been demonstrated and this study highlights that as primary care tended to refer for bleeding symptoms including menorrhagia and epistaxis.
Limitations

• Small number of subjects with confirmed diagnosis
• Conducted at a single center
• 25% of the referred population did not have a complete work up at the time of data collection with an 8% (n = 29) no show or cancellation rate
Bleeding Disorder Referrals

- Age and abnormal laboratory values can predict the diagnosis of a bleeding disorder.
- Most diagnoses were von Willebrand’s disease (6%), coinciding with the general population having the highest rate of diagnosis within bleeding disorders.
- Primary care has a higher screening positivity than Otolaryngology who likely refer more for the higher risk of immediate bleeding.
Acknowledgments

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• Shannon Carpenter, MD
• Oluwaseun Olaiya, DO
• Hung-Wen Yeh, PhD
• Pediatric Institutional Review Board at The Children’s Mercy Hospital & Clinics
References


• Mahdi Shahriari, Mehran Karimi; Are Bleeding Scores Predicting Severity and Outcome in Hemophilia and Rare Bleeding Disorders?. Blood 2016; 128 (22): 4801.


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