Title:
Use of Spirometry to Measure Asthma Control in Patients With Sickle Cell Disease

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Session Title:
Health Promotion in Asthma Patients

Slot:
L 13: Sunday, 30 July 2017: 8:30 AM-9:45 AM
Scheduled Time:
9:10 AM

Keywords:
Acute chest syndrome, Sickle cell disease and asthma

References:


Abstract Summary:
Patients with sickle cell disease who also have asthma are at greater risk for developing acute chest syndrome. These patients should receive pulmonary function testing (spirometry) to diagnose, evaluate, and manage their asthma symptoms. This study examined variations in practice among four large academic medical centers.

Learning Activity:
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<th>LEARNING OBJECTIVES</th>
<th>EXPANDED CONTENT OUTLINE</th>
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<td>The learner will be able to describe the variation in practice as it relates to spirometry testing in patients with Sickle Cell Disease, Acute Chest Syndrome, and Asthma.</td>
<td>Review literature that reports underdiagnosing of asthma in SCD population and under treatment when identified. Review in detail the data and results from data repository for 4 Academic Medical Centers. Identify for each Academic Medical Center the percentage of patients with SCD+ACS+Asthma who have received spirometry testing. Discuss the variation in percentage of patients with SCD+ACS+Asthma who have received spirometry testing among the Academic Medical Centers</td>
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<td>The learner will be able to understand the significance of Asthma as a risk factor for Acute Chest Syndrome in patients with Sickle cell Disease.</td>
<td>Review recent findings in the literature that address the significance of co-morbid asthma, SCD, and ACS. Discuss increased mortality rate in patients with SCD and asthma. Discuss findings that suggest ACS episodes occurring early in life are a significant predictor for future events.</td>
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Abstract Text:

Purpose:

Purpose: The purpose of this study is to determine the use of spirometry testing to monitor and evaluate asthma control in patients with asthma, sickle cell disease and acute chest syndrome, ages 5 to 34 years.

Sickle Cell Disease (SCD) is a common inherited genetic disorder and affects approximately 100,000 people in the United States annually and one in 400 African American births (CDC, 2016). Asthma affects 23 million people in the US alone. African American children are disproportionately affected having a greater prevalence rate for asthma compared to Caucasians, in addition to a higher rate of hospitalization and higher mortality rate. SCD, when combined with a diagnosis of asthma, increases the risk of Acute Chest Syndrome (ACS), which can lead to significant morbidity and mortality. Findings from The National Heart Lung and Blood Institute (NHLBI) funded Sickie Asthma Cohort (SAC) study confirm that asthma is a risk factor for ACS in patients with SCD and that one early life ACS episode was a significant predictor for future ACS events (DeBaun et al., 2014). It has been reported that as many as 28% of children with SCD may have asthma (Strunk et al., 2014). While there seems to be increasing recognition of the importance of co-morbid asthma and SCD, asthma continues to be underdiagnosed and undertreated (DeBaun, Strunk, 2016). NHLBI Guidelines for the Diagnosis and Management of Asthma should be followed for patients with SCD and asthma (EPR 3, 2007). This would include routine follow up by a pulmonology provider to ensure proper management of asthma. Part of this routine care would include Spirometry testing to evaluate effectiveness of asthma medications and subtle changes in pulmonary function. Early detection of a decrease in pulmonary function may lead to changes in management, which may decrease the incidence of an asthma exacerbation and possibly prevent an occurrence of ACS. The number of spirometry procedures conducted may be indicative of how many patients with Asthma and SCD are receiving routine pulmonology management. Data gleaned from the EMR database may show that although a significant number of patients with SCD and ACS carry the diagnosis of asthma, very few have spirometry testing to evaluate the effectiveness of asthma treatment or to provide early detection of worsening lung function.
Methods:

A descriptive cross-sectional study design was utilized to identify the number of patients with SCD, ACS, Asthma and the number of spirometry procedures performed. The Electronic Medical Record (EMR) using i2b2, a de-identified data repository for 4 Academic Medical Centers (AMC) was queried for the count of patients 5-34 years of age seen between 12/01/2010 and 12/01/2015 having co-morbid diagnoses of Asthma, Sickle Cell Disease and Acute Chest Syndrome. Queries to cross-reference those patients with the CPT code for spirometry was then performed. The i2b2 query included: (1) Number of patients with SCD + ACS + Asthma + Spirometry, (2) Number of patients with SCD, (3) Number of patients with SCD + Asthma, (4) Number of patients with SCD + ACS, and (5) Number of patients with SCD + ACS + Asthma. The percentage of SCD + ACS+ Asthma patients having spirometry testing was calculated by dividing SCD + ACS + Asthma + Spirometry by the number of patients with SCD + ACS + Asthma. The four AMC’s were labeled as A, B, C, D.

Results: The combined total number of patients for 4 AMC (A,B,C,D) for categories (1) SCD+ACS+Asthma+Spirometry, (2) SCD, (3) SCD+Asthma, (4) SCD+ACS, (5) SCD+ACS+Asthma are respectively; (1)77, (2)2749, (3) 577, (4) 409, and (5) 249. Number of patients for each AMC for these five categories; (1) Number of patients with SCD + ACS + Asthma + Spirometry, A =<10, B = 18, C = 52, D = <10. (2) Number of patients with SCD, A=428, B=378, C=1202, D=741. (3) Number of patients with SCD+Asthma, A=79 (18.4%), B=57 (15.0%), C=377 (31.3%), D=64 (8.6%). (4) Number of patients with SCD+ACS, A=72 (16.8%), B=78 (20.6%), C=142 (11.8%), D=117 (15.7%). (5) SCD+ACS+Asthma, A=37 (8.6%), B=43 (11.4%), C=146 (12.1%), D=23(3.1%). The percent of patients with SCD+ACS+Asthma who also had spirometry performed for each AMC was calculated (SCD+ACS+Asthma+Spiro/SCD+ACS+Asthma = %); A=<10%, B=41.8%, C=35.6%, D=26%. The total number of patients with SCD+ACS+Asthma for all 4 AMC= 249, those having spirometry = 77, thus (77/249) 30.9% of patients with SCD+ACS+Asthma had spirometry performed.

Conclusion:

Asthma is prevalent in children with SCD and may result in episodes of ACS. Across 4 AMC only 30.9% of patients with SCD, ACS, and asthma received spirometry testing. In addition there is considerable variation among the 4 AMC ranging from <10% to 41.8% receiving spirometry. Despite the NHLBI recommendations for children with asthma it appears that only a third of these patients with co-morbid SCD, ACS, and Asthma receive this procedure. Very few are being routinely tested for changes in pulmonary function, or those tests are not being coded and documented appropriately. Better coding and documentation practices for spirometry testing in those with sickle cell disease and asthma will allow better access for providers to utilize those test results for asthma management. If the testing is not being done routinely, further research should be done to determine if there are barriers to obtaining appropriate pulmonology evaluation and management.