Original Article

Outpatient Pain Predicts Subsequent One-Year Acute Health Care Utilization Among Adults With Sickle Cell Disease

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Abstract

Context. Patient demographic and clinical factors have known associations with acute health care utilization (AHCU) among patients with sickle cell disease (SCD), but it is unknown if pain measured predominantly in an outpatient setting is a predictor of future AHCU in patients with SCD.

Objectives. To determine whether multidimensional pain scores obtained predominantly in an outpatient setting predicted subsequent 1-year AHCU by 137 adults with SCD and whether the pain measured at a second visit also predicted AHCU.

Methods. Pain data included the Composite Pain Index (CPI), a single score representative of a multidimensional pain experience (number of pain sites, intensity, quality, and pattern). Based on the distribution of AHCU events, we divided patients into three groups: 1) zero events (zero), 2) 1 to 3 events (low), or 3) 4 to 23 events (high).

Results. The initial CPI scores differed significantly by the three groups ($F(2,134) = 7.38$, $P = 0.001$). Post hoc comparisons showed that the zero group had lower CPI scores than both the low ($P < 0.01$) and high ($P < 0.001$) groups. In multivariate overdispersed Poisson regression analyses, age and CPI scores (at both measurement times) were statistically significant predictors of utilization events. Pain intensity scores at both measurement times were significant predictors of utilization, but other pain scores (number of pain sites, quality, and pattern) were not.

Conclusion. Findings support use of outpatient CPI scores or pain intensity and age to identify at-risk young adults with SCD who are likely to benefit from

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Introduction

Patients with sickle cell disease (SCD) suffer from acute and chronic pain, but it is the severity and frequency of the acute pain episodes that constitute the major reason for their acute health care utilization (AHCU).[1] Risk for mortality increases in SCD for patients with higher rates of painful episodes.[2] AHCU (emergency department [ED], acute care center [ACC], hospitalization) for SCD presents a significant financial burden to the health care system—an annual cost of $2.4 billion.[3] Although SCD patient demographic and clinical factors are associated with AHCU,[1,3−5] studies in which these factors were systematically examined as predictors of future AHCU for SCD pain are scarce. To identify patients most at risk for AHCU and to develop strategies to improve their care, reduce suffering and mortality risk, and decrease cost associated with AHCU, it is imperative to identify predictors of AHCU in patients with SCD. The purpose of this study of adults with SCD was to determine if a patient-reported pain outcome measure that captures the multidimensional pain experience predominantly from an outpatient setting could predict pain-related AHCU during the subsequent 12 months.

Researchers established that patients with SCD have high utilization of acute health care resources.[4,6] The persistent use of AHCU poses a huge economic challenge to third-party payers, especially the government. In spite of the cost associated with high AHCU by patients with SCD, studies are scant in which investigators examine factors that predict AHCU.

Some research evidence suggests that patient demographics, such as age and gender, are related to AHCU for people with SCD. Younger patients with SCD (18−30 years) have higher AHCU than those who are older (31−45 years),[4] but inconsistent age groupings from study to study[4,7−9] prevent definitive

conclusions about ages most at risk. In one study, female patients with SCD used less ED services and had fewer hospital admissions than male patients with SCD.[5] Other researchers reported that ED charges were higher for female patients with SCD than their male counterparts.[3] In another epidemiological study,[1] unplanned health care utilization was similar for males and females. Taken together, these studies suggest, but are inconclusive, that patient demographic factors, such as age and gender, are associated with AHCU.

Pain is the most common clinical factor[6,10] associated with AHCU in adults with SCD. However, pain measured as a multidimensional experience, such as with the Composite Pain Index (CPI), has been reported for SCD[11,12] but has not been systematically studied as a predictor of AHCU. The CPI score represents the location, intensity, quality, and pattern dimensions of pain. The specific aim of this study was to determine whether CPI scores obtained predominantly at outpatient clinic visits, age, and gender predicted subsequent AHCU by adults with SCD and if CPI scores obtained about 3 months later produced similar findings. We hypothesized that utilization would not differ by gender but younger adults (18−30 years) and those who reported lower CPI scores at their clinic visit would have fewer AHCU events than older adults (older than 31 years) and those with higher pain scores. We also hypothesized that findings would be replicated for the second set of CPI scores and thereby show the robustness and reliability of AHCU prediction.

Methods

Design

This study was a longitudinal comparative investigation. The Institutional Review Board