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Evaluating Buprenorphine as an Alternative to Opioids for Chronic Pain Management in Sickle Cell Disease: A Scoping Review

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Introduction

Chronic pain affects more than 50% of individuals with Sickle Cell Disease (SCD) and is a leading cause of inpatient treatment. Despite growing concerns about opioid side effects and tolerance, high doses of short-acting opioid agonists are still commonly prescribed for both inpatient and outpatient pain management. This standard approach often leads to opioid dependence, increased acute care utilization, and greater strain on healthcare resources. Buprenorphine, a partial opioid agonist, offers a promising alternative for managing chronic pain in SCD patients, particularly those with opioid use disorder. This scoping review aims to evaluate the application of buprenorphine in this patient population.

Materials and Methods

Following the registered protocol on OSF (doi.org/10.17605/OSF.IO/7D4GS), we conducted a scoping review in accordance with PRISMA guidelines to explore the use of partial opioid agonists, specifically buprenorphine, in managing SCD-related pain. We included English-language studies involving adults, reviewed up to March 2023. Two reviewers assessed data from multiple databases, focusing on study type, participant demographics, pain management strategies, and outcomes related to hospital admissions and acute care utilization. Quality assessment was performed using Murad et al.'s tool. Since only published data was used, IRB approval was not required.

Results/Case Report

Out of 70 manuscripts initially identified, 15 were selected for full data extraction, while 8 were excluded due to irrelevance (Figure 1). The remaining 7 studies included four retrospective analyses, one case report, one case series, and one interview study. These studies involved 473 patients, predominantly African American females (median 68%), with a mean age of 34.4 years. Pain intensity was consistently severe (>7/10 on pain scales), and described as tingling, aching, or throbbing.

Transition protocols often required complete discontinuation of full opioids before initiating buprenorphine, with some studies recommending a mild withdrawal phase (Table 1). Buprenorphine dosing ranged from 2-4mg sublingually initially, adjusted based on withdrawal symptoms, with higher doses (≥16mg daily) linked to improved adherence. While the microdosing approach and multimodal analgesia were explored, results were inconsistent. Adverse effects were generally manageable, including withdrawal symptoms, tongue numbness, and occasional worsening of asthma;

no fatalities were reported.
Buprenorphine use led to significant reductions in emergency department visits (from 9.1 to 4.2 per year) and hospital stays (from 5.8 to 2.8 days) (Table 2). Patient interviews revealed initial discomfort but noted improved mood and functionality over time, with a general preference for transitioning from full opioid agonists to buprenorphine.

Discussion

Buprenorphine appears to be a viable alternative to full opioid agonists for chronic pain management in SCD patients, potentially reducing opioid dependence and adverse effects. Its partial agonist properties, while associated with some withdrawal risk, result in less opioid tolerance compared to full agonists. The "ceiling effect" of buprenorphine may help mitigate its addictive potential and reduce adverse effects, potentially decreasing the need for acute care and inpatient resources. Further research is needed to confirm these findings and establish standardized treatment protocols.

References

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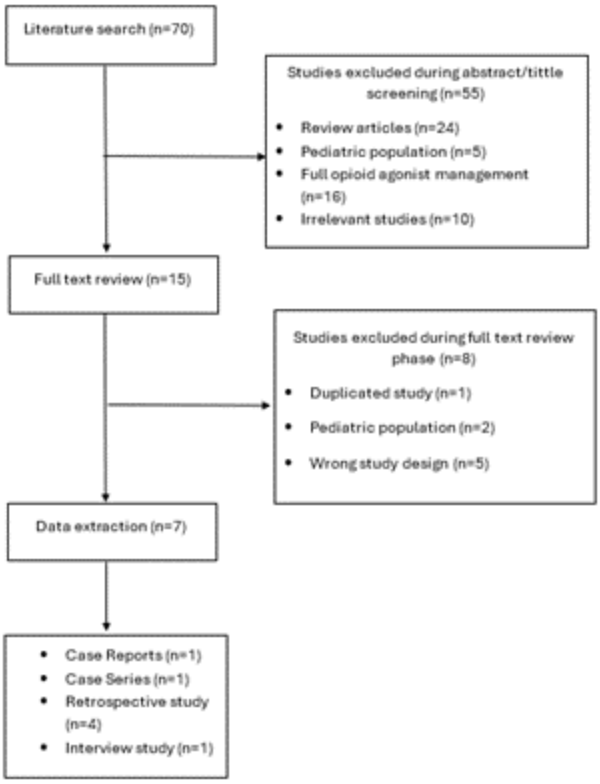
Disclosures

No

Tables / Images


Literature search (n=70)
Studies excluded during abstract/tittle screening (n=55)
Review articles (n=24)
Pediatric population (n=5)
Full opioid agonist management (n=16)
Irrelevant studies (n=10)
Full text review (n=15)
Studies excluded during full text review phase (n=8)
Duplicated study (n=1)
Pediatric population (n=2)
Wrong study design (n=5)
Data extraction (n=7)
Case Reports (n=1)
Case Series (n=1)
Retrospective study (n=4)
Interview study (n=1)