Implementing a Clinical Practice Guideline for the Treatment of Bronchiolitis in a High-Risk Hispanic Pediatric Population

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ABSTRACT

Introduction: Bronchiolitis is the leading cause of hospitalization among infants and young children. Because of its frequency, a clinical practice guideline for bronchiolitis was implemented in this population in an effort to decrease costs and the number of diagnostic evaluations performed and medications used without increasing length of stay or transfers to the pediatric intensive care unit.

Methods: A retrospective chart review of 322 pediatric admissions to a rural community hospital was conducted (169 before guideline implementation and 153 after guideline implementation), and data were categorically stratified into three groups for comparison purposes. Descriptive statistics were used to analyze the data, with a p value < .05 defining significance.

Results: During the project period, patients with a mean age of 9.6 months were admitted to the hospital with bronchiolitis. Statistically significant decreases in cost per day and decreases in use of antibiotics and chest radiographs were achieved without increasing length of stay or pediatric intensive care unit transfers.

Discussion: This project demonstrated feasibility in implementing an evidence-based clinical practice guideline in a rural hospital to improve patient outcomes. J Pediatr Health Care. (2015) *29*, 169-180.

KEY WORDS

Bronchiolitis, RSV, high-risk populations, implementation, clinical practice guidelines

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The data collection and evaluation portions of this project were supported by a grant from the University of Texas Health Science Center–Houston School of Nursing.

Conflicts of interest: None to report.

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0891-5245/$36.00

Published online November 22, 2014.

http://dx.doi.org/10.1016/j.pedhc.2014.10.002

Bronchiolitis is the leading cause of infant hospitalization in the United States (Zorc & Hall, 2010) but also occurs frequently in toddlers, especially those younger than 24 months (American Academy of Pediatrics [AAP], 2006). Nationally, total direct costs related to hospitalizations for bronchiolitis in infants and young children are estimated at $545 million per year (Hasegawa, Tsugawa, Brown, Mansbach, & Camargo, 2013).

Bronchiolitis is a disorder of the lower respiratory tract that is caused by infection with contagious seasonal viruses such as respiratory syncytial virus (RSV; Flaherman et al., 2010; Plint et al., 2009) and is characterized by acute inflammation, edema, necrosis of the epithelial cells lining the small airways, and increased mucus production (AAP, 2006). The infectious process can lead to symptoms that range from mild rhinorrhea and cough to more severe symptoms such as wheezing, respiratory distress, apnea, and hypoxemia (AAP, 2006). Most cases commonly occur from December to March, and 44% of infants in the United States are treated for RSV bronchiolitis in their first year of life (Petruzella & Gorelick, 2010). Although 95% of these infants will be treated as outpatients or in emergency departments (EDs), hospital admissions for bronchiolitis have almost doubled during the past 10 to 15 years (Petruzella & Gorelick, 2010; Plint et al., 2009). More than 70% of infants and children with bronchiolitis are seen at community hospitals with availability of varying degrees of pediatric expertise (Parikh, Hall, & Teach, 2014).

In 2006, the AAP published a treatment guideline for bronchiolitis that remains the standard of care today. However, some clinicians believe the AAP guideline does not reflect routine practice, and implementation of the guideline remains highly variable (Christakis et al., 2005; Johnson et al., 2013; McCulloh et al., 2012). Provider treatment preference, rather than evidence-based practice, continues to be common (Mittal, et al., 2014; Sangrador, Gonzalos de Dios, & Research Group of the aBREVIADo Project, 2013). Zentz (2011) noted that in applying the Appraisal of Guidelines for Research and Evaluation (AGREE) instrument to evaluate the AAP 2006 treatment guideline for bronchiolitis, the guideline lacked an implementation plan. Although use of the AAP's 2006 treatment guideline for bronchiolitis has demonstrated a significant reduction in the utilization of diagnostic and therapeutic resources (Parikh et al., 2014), standardizing treatment requires changing provider behavior, which is still a challenge.

The AAP 2006 guideline reports that neither bronchodilators nor corticosteroids have significant efficacy in the treatment of bronchiolitis, which is supported by the current literature (Clavenna et al., 2014; Gadomski & Scribani, 2014). One prior study conducted in 2004, before the publication of the AAP 2006 guideline, demonstrated a synergistic effect of nebulized bronchodilators and systemic corticosteroids when used concurrently (Kuyucu, Unal, & Yilgor, 2004). The findings of this study were subsequently supported by Plint and colleagues (2009), who reported that while nebulized bronchodilators or systemic corticosteroids given alone did not alter clinical outcomes, the concurrent use of both resulted in slightly decreased rates of hospitalization and respiratory distress, although the findings were no longer significant after adjustment for multiple comparison groups.

Studies published after the AAP guidelines were issued have analyzed the impact of the guidelines, as well as compliance with the guidelines. The author of one study found that hospitalists discontinued unnecessary systemic corticosteroid therapy and antibiotic therapy more frequently than did nonhospitalists (McCulloh, 2012). A study of patients with bronchiolitis in the ED found that although use of chest radiographs significantly decreased after publication of the AAP guidelines, there has not been a decrease in use of nonrecommended therapies such as antibiotics, bronchodilators, and systemic corticosteroids (Johnson et al., 2013).

According to the AAP, an evidence-based approach to practice guideline development requires that an explicit link between evidence and recommendations be defined (AAP, 2006). A current lack of evidence supporting traditional treatments partially explains why the current AAP guideline does not specifically address how to care for hospitalized pediatric patients with bronchiolitis and instead focuses on what treatments are not routinely recommended (e.g., use of bronchodilators, corticosteroid medications, ribavirin, antibacterial agents, and chest physiotherapy). The specific AAP recommendations for treatment include intravenous fluids for hydration, supplemental oxygen if saturations consistently remain below 90%, and suctioning of nasal secretions (AAP, 2006). The need for an evidence-based clinical practice guideline (CPG) for the effective treatment of bronchiolitis in pediatric patients in everyday practice remains apparent (especially for patients who are considered high risk).

PURPOSE OF PROJECT

The stakeholders for this project determined that wide variability existed in the treatment of bronchiolitis even within their own hospitalist group in a rural setting, and a consensus was reached that the care provided to patients with bronchiolitis should be standardized across providers. A systematic review was conducted to identify the factors that contribute to variations in management and noncompliance with the AAP clinical guidelines in treating infants and young children with bronchiolitis and to determine if there were any inherent risks for a predominantly low-socioeconomic, Hispanic, infant population of a South Texas county that would warrant caution in implementing a specific CPG. Search terms for the systematic review of the literature included "minority," "Hispanic," "Medicaid," "bronchiolitis," and "RSV."

The purpose of the practice improvement project was to implement a bronchiolitis CPG for infants and young children in a South Texas population utilizing AAP recommendations as a foundation, but also including additional risk factors for severe