



## ORIGINAL ARTICLE

# Hospitalizations of children with sickle cell disease in the Brazilian Unified Health System in the state of Minas Gerais ☆,☆☆

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**KEYWORDS**

Sickle cell disease;  
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Epidemiology;  
Health system;  
Newborn screening;  
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**Abstract**

**Objective:** To identify and characterize hospital admissions and readmissions in the Brazilian Unified Public Health System (Sistema Único de Saúde [SUS]) in children with sickle cell disease diagnosed by the Minas Gerais Newborn Screening Program between 1999 and 2012.

**Methods:** Hospital Admission Authorizations with the D57 (International Classification of Diseases-10) code in the fields of primary or secondary diagnosis were retrieved from the SUS Databank (1999–2012). There were 2991 hospitalizations for 969 children.

**Results:** 73.2% of children had hemoglobin SS/Sβ<sup>0</sup>-thalassemia and 48% were girls. The mean age was 4.3 ± 3.2 years, the mean number of hospitalizations, 3.1 ± 3.3, and the hospital length of stay, 5 ± 3.9 days. Hospital readmissions occurred for 16.7% of children; 10% of admissions were associated with readmission within 30 days after discharge; 33% of readmissions occurred within seven days post-discharge. There were 41 deaths, 95% of which were in-hospital. Secondary diagnoses were not recorded in 96% of admissions, making it impossible to know the reason for admission. In 62% of cases, hospitalizations occurred in the child's county of residence. The total number of hospitalizations of children under 14 with sickle cell disease relative to the total of pediatric hospitalizations increased from 0.12% in 1999 to 0.37% in 2012.

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☆☆ Study carried out at Universidade Federal de Minas Gerais (UFMG), Belo Horizonte, MG, Brazil.

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**PALAVRAS-CHAVE**

Doença falciforme;  
Serviço Hospitalar de  
Admissão de  
Pacientes;  
Epidemiologia;  
Sistema Único de  
Saúde;  
Triagem neonatal;  
Brasil

**Conclusions:** A high demand for hospital care in children with sickle cell disease was evident. The number of hospitalizations increased from 1999 to 2012, suggesting that the disease has become more “visible.” Knowledge of the characteristics of these admissions can help in the planning of care for these children in the SUS.

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## Internações de crianças com doença falciforme no Sistema Único de Saúde no Estado de Minas Gerais

**Resumo**

**Objetivo:** Identificar e caracterizar as internações e reinternações hospitalares no Sistema Único de Saúde (SUS) de crianças com doença falciforme, diagnosticadas pelo Programa de Triagem Neonatal de Minas Gerais entre 1999 e 2012.

**Métodos:** Extraíram-se do banco de dados do SUS as Autorizações de Internação Hospitalar com o código D57 (Classificação Internacional de Doenças10) nos campos de diagnóstico primário ou secundário (1999-2012). Identificaram-se 969 crianças, totalizando 2.991 internações.

**Resultados:** 73,2% das crianças tinham hemoglobina SS/Sβ<sup>0</sup>- talassemia e 48% eram meninas. A média de idade foi de 4,3 ± 3,2 anos, a do número de internações, 3,1 ± 3,3 e a do tempo de permanência, 5 ± 3,9 dias. As readmissões hospitalares ocorreram em 16,7% das crianças; 10% das internações se associaram à readmissão em até 30 dias pós-alta; 33% das readmissões ocorreram em até 7 dias pós-alta. Ocorreram 41 óbitos, 95% em ambiente hospitalar. O diagnóstico secundário não foi registrado em 96% das internações, impossibilitando conhecer o motivo da internação. Em 62% dos casos, as internações ocorreram no município de residência da criança. O total de internações de crianças até 14 anos com doença falciforme em relação ao total das internações pediátricas passou de 0,12% em 1999 para 0,37% em 2012.

**Conclusões:** Constatou-se elevada demanda por cuidados hospitalares, cujo aumento relativo entre 1999 e 2012 sugere incremento da “visibilidade” da doença falciforme. O conhecimento das características dessas internações pode contribuir no planejamento do cuidado na rede assistencial do SUS.

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**Introduction**

According to the World Health Organization (WHO) publications, it is believed that 270 million people worldwide (7% of the world's population) carry genes that determine the presence of abnormal hemoglobins (Hb).<sup>1-3</sup> Sickle cell disease (SCD) is a genetic disorder of great clinical and epidemiological importance, whose basic etiology is the inheritance of the beta S-globin gene, either in the homozygous state or combined with another mutant allele that pathologically interacts with hemoglobin S. In Brazil, the number of people with SCD is estimated at 25,000–30,000 and the number of newborns is estimated at 3500 a year.<sup>4</sup> According to the Neonatal Screening Program of the state of Minas Gerais (PTN-MG), the incidence of the sickle cell trait is 3.3% in a total of approximately 250,000 newborns a year; the SCD rate is approximately 1:1400.<sup>5</sup>

The onset of the disease's clinical manifestations usually occurs after the age of 3 months and lasts throughout life, with a marked variation in severity between the affected individuals. They can be grouped according to two basic pathophysiological events: vasoconstriction and chronic hemolysis.<sup>6-8</sup> Clinical events such as painful crises,<sup>9</sup>

bacterial infections, acute chest syndrome, and chronic complications lead to several hospital admissions and high morbidity. Although most of the health problems of individuals with SCD can be cared for in primary care services, some acute events, including severe vaso-occlusive crises, require repeated hospital admissions.<sup>10</sup>

There are few national bibliographical references on the epidemiological aspects of hospital admissions by SCD. The aim of this study was to describe the hospital admissions of children with SCD that were screened by the State Neonatal Screening Program, in hospital units of the Brazilian Unified Health System (SUS), in Minas Gerais, based on information contained in the database of the SUS Hospital Information System (SIH). Associations between hospital admissions and clinical and epidemiological variables were also investigated.

**Methods**

The descriptive and cross-sectional study was based on secondary data from the hospital admission system (SIH-SUS) for the state of Minas Gerais. Data related to all children

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