

# Multidrug toxicity during acute painful crises in sickle cell diseases

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## Abstract

**Background:** Hydroxyurea and red blood cells (RBC) transfusions prolong survival in sickle cell diseases (SCD).

**Methods:** All patients were included.

**Results:** We studied 222 males and 212 females (30.8 vs 30.3 years,  $p > 0.05$ ). Smoking (23.8% vs 6.1%,  $p < 0.001$ ), alcohol (4.9% vs 0.4%,  $p < 0.001$ ), transfused RBC in their lives (48.1 vs 28.5 units,  $p = 0.000$ ), autoimmune hemolytic anemia (AIHA) (4.0% vs 1.8%,  $p < 0.05$ ), multidrug toxicity during acute painful crises (APC) (1.3% vs 0.4%,  $p < 0.05$ ), disseminated teeth losses (5.4% vs 1.4%,  $p < 0.001$ ), ileus (7.2% vs 1.4%,  $p < 0.001$ ), stroke (12.1% vs 7.5%,  $p < 0.05$ ), cirrhosis (8.1% vs 1.8%,  $p < 0.001$ ), chronic renal disease (9.9% vs 6.1%,  $p < 0.05$ ), chronic obstructive pulmonary disease (25.2% vs 7.0%,  $p < 0.001$ ), coronary heart disease (18.0% vs 13.2%,  $p < 0.05$ ), leg ulcers (19.8% vs 7.0%,  $p < 0.001$ ), and clubbing (14.8% vs 6.6%,  $p < 0.001$ ) were higher in males.

**Conclusion:** As an accelerated atherosclerotic process, hardened RBC-induced capillary endothelial damage terminates with end-organ insufficiencies in early decades in SCD. The increased metabolic rate during stresses aggravates sickling and capillary endothelial edema, terminating with infarcts. The deaths seem sudden, and mostly develop just after hospital admission in hydroxyurea nonusers. Rapid RBC supports are life-saving but preparation takes time. RBC supports in emergencies become difficult due to aging and transfusions-induced AIHA. Thus, we need hydroxyurea with the highest doses even up to moderate anemia to decrease number and severity of APC as the most significant indicators of disease severity. Multidrug toxicity during APC is rare and not due to hydroxyurea alone, thus we must use hydroxyurea even during APC.

**Key words:** Sickle cell diseases, acute painful crises, multidrug toxicity, hydroxyurea, red blood cells transfusions, excess fat tissue, atherosclerosis