Abstract:

Approximately 100,000 African American descendants in the United States and millions worldwide suffer with sickle cell disease (SCD) which is a rare genetic single base-pair point mutation at the sixth codon. Despite the current increase of pharmacotherapeutic innovations for sickle cell diseases, there are substantial cost disparities across various treatment choices. By comparing the various drugs, administration routes, approximate annual costs, daily expenses, and anticipated costs per quality-adjusted life year (QALY), this study assesses the various financial landscape of SCD pharmacotherapy.

A common oral drug known as hydroxyurea, is a conventional disease-modifying medication that is used to boost fetal hemoglobin synthesis and decreases the occurrence of vaso-occlusive crises. With a yearly cost of approximately $1,000 and solid long-term safety evidence, it has continuously shown good cost-effectiveness (Teigen et al., 2023). For several patients, hydroxyurea is considered a feasible and accessible first-line measurement for treatment due to its oral administration. With its decades of clinical data and capacity to lower hospitalization rates (McGann et al., 2025). Voxelotor and Crizanlizumab are newer pharmaceuticals which on the contrary cost more than average $80,000 a year and may come close to above or around the traditional willingness to pay rates. Two most recent licensed gene treatments, Casgevy and Lyfgenia have unparalleled upfront prices of more than $2-3 million per treatment, in addition to offering revolutionary curative effects.

With daily cost equivalents, hydroxyurea cost relatively less that $3 a day while Volxelotor and Crizanlizumab cost an upwards between $6,000 and $8,000 a day. This clear discrepancy highlights the expanding financial gap between gene-based therapies, sophisticated biologics, and conventional oral drugs, raising concerns about long-term affordability, insurance sustainability, and equitable access. These price methods reflect financial incentives from the orphan drug market, intricate processes, patent protections, and persistent structural inequities in research financing.