Racial Disparities In The Treatment and Outcomes of Pediatric Type 1 Diabetes

Authors: Maninderpal Sethi, PA-S, MS and Daytheon Sturges, Ph.D., MPAS, PA-C, CAHIMS, CHES

Background and Introduction:
Approximately 1.6 million people in the United States (U.S.) are living with type 1 diabetes (T1D); 187,000 are children/adolescents1 with prevalence steadily increasing in the US and worldwide, especially amongst racial/ethnic minorities. By 2050, projections indicate 600,000 adolescents >20 years will be diagnosed; a majority being racial/ethnic minorities.2 Racial health disparities among U.S. children has been described by the American Academy of Pediatrics as being “extensive, pervasive, and persistent,”3 multi-factored, and across numerous dimensions, has worsened over time, and most apparent in rates/management of chronic disease and mortality.4 Factors that contribute to these disparities are social determinants of health and provider bias, which leads to variances in quality of care based on race/ethnicity. Inequities increase risk of complications and adverse health outcomes.

There is still limited data on how race impacts treatment and clinical outcomes. A thorough analysis is needed to properly understand constructs. The goal of this research is to highlight disparities in treatment that burden racial minorities and educate providers on systems of oppression that exist within T1D treatment to provide better health outcomes for pediatric patients.

Methods:
Three searches conducted via Pubmed on the topic of racial disparities existing in treatments and outcomes of pediatric patients with T1D. The terms “disparity and race and type 1 diabetes”, “outcome and disparity and type 1 diabetes”, “race and disparity and child or pediatric and type one diabetes” were used. Publications between November 2010 and March 2021 were included, consisted of qualitative studies and meta-analyses. 102 publications were reviewed, and 28 articles were referenced.

T1D treatment
- Hemoglobin A1c (HbA1c) is used as an index to identify glycemic control, indicate the risk of developing T1D complications, and to inform care. T1D: HbA1c of ≥6.5% (with normal being less than 5.7% and prediabetes being 5.7% to 6.4%).5
- Primary therapy: Exogenous insulin, which is administered via syringe/needles, injector devices, insulin pumps, inhaled insulin6
- diet modification7
- Continuous Glucose Monitors8

Social Determinants of Health (SDOH)
SDOH has a prevailing influence on health outcomes. SDOH is defined as “conditions in which people are born, grow, work, and age, and the systems put in place to deal with illness.”9 - income, socioeconomic status (SES), and education can alter the course of future health outcomes and is impacts critical development during childhood.10 - microvascular disease beings to appear during adolescence sets stage for risk of complications.11 - cardiovascular and cerebrovascular disease are accelerated in adulthood. Those exposed to poorer SDOH are at higher risk of early vascular dysfunction and poorer overall health outcomes.

SDOH seen as “third arm of T1D complication risk”12

Provider Bias
Disparities persist after controlling for social determinants (SES, age, education). Research indicates that provider bias, preconceived stereotypes, and prejudices contribute to disparities in healthcare.13 American Diabetes Association established guidelines conclude that basal/bolus treatment regimens and frequent blood glucose (BG) testing are essential to maintain a state of euglycemia. Disparities in regimen are directly associated with detrimental health outcomes.14-15
- A study by Chalew et al. investigated social and biological factors involved in glycemic control to determine if connections between variables (psychological factors, frequency of blood glucose checks using meter, and Hba1c and race differences, specifically between Black and white pediatric patients exist. White patients performed twice as many BGs/day than Black patients

Interventions
Diabetes technologies, like CGM and pumps provide better glycemic control.
- A study by Plotnick et al. investigated the efficacy and safety of pump therapy and was found to be effective in reducing the number of hypoglycemic events, and lowered HbA1c.16
- A study by Laffel et al. found a drop in HbA1c in the CGM group whereas in the meter group had no statistically significant change.17

What to do about Provider bias
Pump therapy and CGM are effective technologies for management of T1D, yet Black patients are less likely to be prescribed diabetes technologies.
- white children are 3.6 times more likely to be on a pump compared to black children across all SES levels; black children of a household income of at least $100,000 were using pumps at the same proportion white children of a household income of $50,000.5

Solution: Increase the proportion of minority providers (specifically Black providers) & mandatory bias training/education