THE IMPACT OF SICKLE CELL DISEASE TREATMENT ON OVARIAN RESERVE

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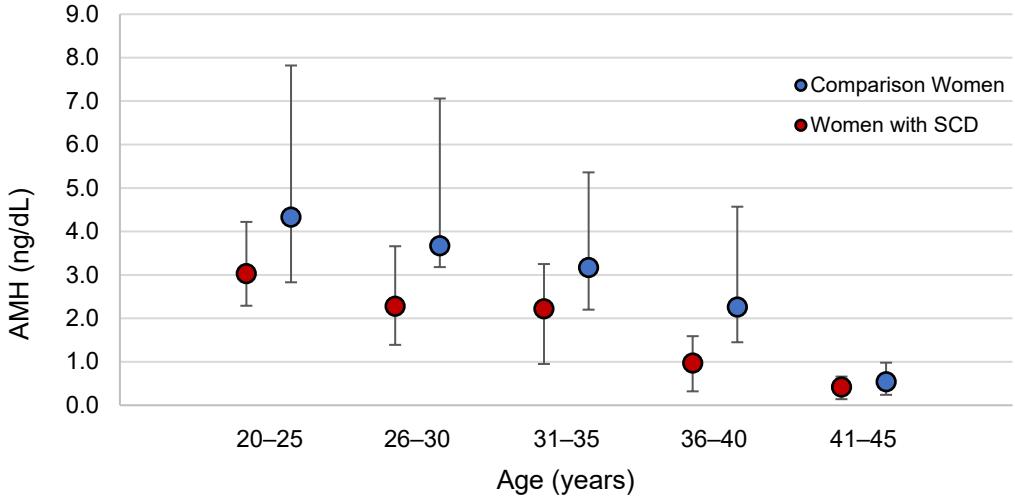
Background: Sickle cell disease (SCD) is a group of inherited blood disorders where defective hemoglobin is prone to conversion into rigid, elongated polymers in its deoxygenated state, leading to hemolysis, vaso-occlusive crises (VOC) and end-organ damage [1]. There are scant data on how repeated VOC affect the ovaries. It is also possible that SCD treatments may exacerbate ovarian follicular loss. Blood transfusions may result in ovarian iron deposition and reactive oxygen species generation. Hydroxyurea, a daily oral SCD-modifying agent, may be associated with increased risk of diminished ovarian reserve [2, 3].

Objective: Our primary objective was to compare ovarian reserve markers of women with SCD to a similar cohort of healthy women without SCD and to evaluate the impact of hydroxyurea and iron overload on ovarian reserve in those with SCD.

Materials and Methods: Women aged 20–45 years with SCD were recruited from a comprehensive SCD center in Atlanta, Georgia (n=152). A comparison group of women with no history of cancer or SCD between the ages of 20–45 years was recruited (n=128). All study participants completed a detailed interview. SCD treatment, including hydroxyurea use, receipt of blood transfusions, and history of iron overload was abstracted from medical records. All study participants had blood drawn to measure anti-Mullerian hormone (AMH) levels. Models were fit to examine the relationship between log(AMH) and SCD, adjusting for age. The analysis was repeated among women with SCD to examine history of hydroxyurea use (current, previous, never) and current iron overload (ferritin levels ≥1000 ng/mL, ferritin levels <1000 ng/mL).

Result(s): Of the women with SCD, 53.9% had used hydroxyurea and 25.0% had iron overload. Women with SCD were younger (mean age: 30.1 [standard deviation [SD] 7.4] years) than comparison women (mean age: 34.8 [SD 6.8] years). When participants were stratified by age, the median AMH was lower among women with SCD in each age-group compared to comparison women (Figure 1).

Figure 1. Median AMH Values and Interquartile Range Among Women with SCD and Comparison Women



The predicted age-adjusted AMH among women with SCD (1.12, 95% confidence interval [CI] 0.91–1.37) was 46% lower than that for comparison women (2.06, 95% CI 1.64–2.59). Among women with SCD, those who were currently using hydroxyurea had 34% lower (95% CI 8–52%) age-adjusted AMH values compared to women with SCD who never used hydroxyurea. There were no differences among women with SCD for predicted age-adjusted AMH values in those with iron overload (1.03, 95% CI 0.75–1.42) and those without iron overload (1.14, 95% CI 0.94–1.39).

Conclusions: Age-adjusted AMH values among those with SCD were lower than those of comparison women without SCD and may be even lower among those treated with hydroxyurea.

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References:

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