

ABSTRACT <<John Semuwemba (DMR, HSM(Kab), BSc(Mak); Master of science Physiology>>>

Introduction: “Delivery of a normal healthy baby is a reflection of the qualitative and quantitative intra uterine environment health that ensures fetal survival,”(BIMPONG 2020). The impact of anemia during pregnancy involves impaired placental perfusion and fetal hypoxia, affecting vital physiological and biochemical pathways. This disruption alters fetal developmental programming, growth, and survival, thereby influencing perinatal outcomes and increasing susceptibility to various non-communicable diseases in adulthood. This study compared the fetal cardiovascular parameters among non-anemic and anemic women with singleton third-trimester pregnancy and the correlation between the severity of maternal anemia and fetal cardiovascular parameters.

Methods: A cross-sectional study among 20-35-year-old, women with singleton third trimester pregnancy attending Mbarara Regional Referral Hospital between March 2023 and August 2023. The non-anemic group had Hb ≥ 11 g/dL, mild anemia(Hb:10-10.9 g/dL), moderate anemia (7-9.9 g/dL), and severe anemia Hb<7g/dL. Fetal MCA and UA flow were assessed by Doppler-derived indices, ratios and other physiological parameters such as volumetric flow. ANOVA was used to compare means while Spearman’s correlation coefficient was used to evaluate there relationships between the fetal flow parameters and the severity of anemia.

Results: We enrolled 288 participants with a mean age of 27 ± 4.3 years. The UA S/D ratio PI among the non-anemic were lower than among the anemic. RI of the non-anemic (0.58 ± 0.09) was significantly different from the anemic (0.61 ± 0.09) ($p=0.006$). Similarly, the S/D ratio, RI showed a highly significant escalation from among the mild to the severely anemic. The PI increased from (0.88 ± 0.18) among the mild, moderate (0.92 ± 0.24) to (1.09 ± 0.34) severe anemia, with $p < 0.001$. No significant differences were observed in middle cerebral artery flow parameters between anemic and non-anemic groups; for instance, PI –among the non-anemic was (3.13 ± 1.61) vs. (1.67 ± 0.38) among the anemic, $p = 0.280$.

Conclusion:

Anemic women exhibited higher umbilical artery flow resistance, indicating altered blood flow patterns with increasing severity of maternal anemia. However, no significant difference between the middle cerebral artery flow parameters for both groups. These findings suggest that maternal anemia influences umbilical artery hemodynamics, potentially responsible for altered fetal well-being. Understanding these associations could contribute to enhanced antenatal care strategies, emphasizing the importance of monitoring maternal anemia and its potential implications on fetal cardiovascular health.