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ASSESSING THE IMPACT OF SOCIOECONOMIC STATUS ON MATERNAL AND CORD SERUM OMEGA-3 POLYUNSATURATED FATTY ACID LEVELS

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Background: Omega-3 (n-3) polyunsaturated fatty acids (PUFAs) modulate inflammation throughout the lifespan and are essential in fetal growth and development. Previous studies have demonstrated that individuals with lower socioeconomic status (SES) may be at risk for low intake of n-3 PUFAs; however, no research has compared the concentrations of these nutrients present in maternal and cord serum between markers of SES.

Significance of Problem: Individuals with low serum levels of n-3 PUFAs may suffer from unfavorable birth and pregnancy outcomes. Therefore, it is important to identify populations who may have decreased serum levels of these nutrients in order to provide nutritional recommendations to optimize prenatal care.

Objective: The purpose of this study is to assess the relationship between markers of SES and levels of n-3 PUFAs in maternal and cord serum in a group of patients delivering at a Midwest Academic Medical Center.

Methods: An IRB-approved study enrolled mother-infant pairs (n=55) at the time of delivery for collection of maternal and cord serum samples. n-3 PUFA levels quantified included Eicosapentaenoic acid (EPA), Docosahexaenoic acid (DHA), and total n-3 PUFAs. Markers of SES include private vs public insurance, income ≤150% of the poverty line vs >150%, and college degree earners vs no college degree. Descriptive statistics were run for all variables. The Mann-Whitney U test was used to assess differences in n-3 PUFA levels between SES groups. A $p<0.05$ was considered statistically significant.

Results: Median gestational age at delivery was 39.3 weeks in this cohort. Significantly higher nutrient levels were present in college-educated mothers vs less than college-educated mothers for maternal EPA (9.44 µg/mL vs 5.13 µg/mL, p=0.010), cord EPA (1.88 µg/mL vs 1.40 µg/mL, p=0.011), cord DHA (37.96 µg/mL vs 32.80 µg/mL, p=0.014), and total cord n-3 PUFAs (44.23 µg/mL vs 39.34 µg/mL, p=0.024). Median cord EPA levels were significantly higher in those with private insurance compared to public (1.79 µg/mL, 1.18 µg/mL, p=0.022). Additionally, median cord EPA levels were significantly higher in those >150% the poverty line (1.79 µg/mL, 1.10 µg/mL, p=0.030). No other significant differences were observed between SES groups and n-3 PUFA levels.

Conclusion: Our findings suggest that individuals with lower SES may be at risk for lower serum levels of n-3 PUFAs in pregnancy, which could predispose them to adverse birth and pregnancy outcomes. Future studies should focus on replicating these results in a larger, more heterogeneous sample and should consider analyzing additional markers of SES.