UMASS MEDICAL SCHOOL Graduate School of Biomedical Sciences

The Graduate School of Biomedical Sciences
Masters in Clinical Investigation Program

Announces the MSCI Thesis Defense of

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Potential Causes of Extrauterine Growth Restriction in Premature Infants Born Appropriate for Gestational Age

Tuesday, April 27, 2021 at 4 p.m. Via Zoom Meeting

Background: Extrauterine growth restriction (EUGR) is multifactorial and predisposes infants to multiple morbidities that can be significantly ameliorated by adequate nutrition and appropriate longitudinal growth. Premature infants who experience EUGR are at risk for developmental delays, behavioral problems, and cardiometabolic dysregulation. Very low birthweight preterm (VLBW) infants are particularly affected by EUGR, demonstrating poor longitudinal growth patterns during their hospitalization leading to EUGR that persists long after discharge.

Methods: We conducted a retrospective chart review of all infants born at the University of Massachusetts level III neonatal intensive care unit from January 2016 to June 2020. Infants born either appropriate or large for gestational age (AGA, LGA) at this NICU and ≤ 32 0/7 weeks gestational age with EUGR were examined for a variety of potential factors affecting growth, including delayed return to birthweight, timing of growth failure, hyponatremia, and necrotizing enterocolitis (NEC).

Results: We investigated potentially growth-related factors among infants who were born AGA who had EUGR before and after instituting caloric and volume supplementation. The odds ratio (OR) of growth failure for infants experienced intervention was reduced by 53% (OR=0.47, 95% CL 0.24-0.95, p=0.04). When comparing the predetermined dichotomized factors between infants with EUGR, the only factor found to be significantly different between the two cohorts was NEC. When modeled using multivariate linear regression, birth weight %tile, NEC, and “constitutionally small” were associated with greater weight loss ($p<0.05$), while GA at birth was associated with less weight loss (p=0.05).

Conclusions: In this observational retrospective cohort study, we found no significant difference between the baseline characteristics of VLBW infants born AGA with and without EUGR who underwent a volume supplementation protocol. This protocol reduced the OR of EUGR by 53% but a subset of infants still experienced EUGR. Statistical analysis of these infants showed that lower birthweight, birthweight close to the 10th percentile, and NEC increase the rate of EUGR, but later birth gestational age reduced the rate of EUGR. Infants with these risk factors require additional nutritional support to avoid the life-long consequences of EUGR.

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