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Epigenetic Role of Gut Microbiota in Patients Receiving Hemodialysis

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Problem Statement: Burgeoning evidence suggest gut (GI) microbiota (MB) regulate physiologic homeostasis in human that may influence adverse symptoms experienced by patients on hemodialysis (POH). Studies examining epigenetic factors such as miRNAs, regulators of gene expression, report altered levels in POH which may affect progression of kidney disease and development of complications. However, the epigenetic role of GIMB in POH is unclear. The aims of this study are to explore epigenetic roles of GIMB by examining 1) epigenetic biomarkers miRNAs, 2) association between miRNAs and GIMB, and 3) influence of lifestyle factors (diet and physical activity) on the association in POH.

Methodology: A cross-sectional correlational study was conducted with 20 POH recruited from a local dialysis clinic during April-May, 2018. GIMB was measured using stool specimens and miRNAs with blood. Dietary intake was measured with Block Dialysis Food Frequency Questionnaire and physical activity with International Physical Activity Questionnaire. Descriptive statistics was used to characterize GIMB and miRNAs, spearman's correlation to examine the association between the two, and Kruskal Wallis to examine the influence of lifestyle factors on the association.

Results: Participants who completed the study(N=19) had a mean age of 61.8yrs. Most participants were White (73.7%) and male (75%). Activity levels were evenly with evenly distributed: high 31.6%, moderate 36.8%, and low 31.6%. Notable miRNAs found were mir-142 related to immunity, mir-146a related to glucose regulation and renal inflammation, and mir-15b, mir-192, and mir-29c previously reported in POH. Significant correlations were found between a few GIMB and miRNA. Associated miRNAs will be mapped against database to identify affected physiologic pathways. More results will be available on-site.

Implication: Findings may provide insights to additional therapeutic targets and allow nephrology nurses to play a critical role in optimizing patients' lifestyle factors that may impact epigenetic role of GIMB in POH.

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