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BIOM-10. EXAMINATION OF GROWTH DIFFERENTIATION FACTOR 15 (GDF15) EXPRESSION AS A POTENTIAL PROGNOSTIC BIOMARKER IN PEDIATRIC BRAIN TUMORS

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BACKGROUND: Childhood brain tumors remain a leading cause of death with significant treatment-related morbidity and mortality, including disproportionate rates of altered metabolism, neuropathy, and poor quality-of-life. Growth Differentiation Factor 15 (GDF15), a circulating cytokine released by tissue injury, mediates nausea, vomiting, and anorexia, and promotes tumor growth, angiogenesis, and metastasis in adult cancers, predicting worse progression-free survival in adults with low-grade gliomas. Despite adult cancer data, GDF15 remains unexplored in children. Published pilot data demonstrate higher circulating GDF15 in children with cancer compared to healthy controls, but GDF15 expression has not been studied in pediatric brain tumors. We present GDF15 tumor tissue expression with tumor type, grade, metastasis, and progression to inform future study of GDF15’s role in pediatric brain tumors. METHODS: Single-center retrospective review of 64 pediatric brain tumor specimens collected through our Precision Genomics Program. GDF15 RNA expression (normalized to β-actin tissue expression) was log-transformed. Mean GDF15 expression based on diagnosis was compared (using ANOVA) and two-sample t-tests were used to compare metastatic, progressive, and high-grade disease. RESULTS: Highest mean GDF15 expression was seen in medulloblastoma (1.96±0.66, N=3) and lowest in low-grade glioma (0.79±0.26, N=27), but groups were not statistically different (p=0.29). GDF15 expression was higher in progressive (1.46±0.22) versus non-progressive disease (0.76±0.24, p=0.04). Although not statistically different, GDF15 expression was higher in high-grade (1.43±0.27) compared to low-grade (1.03±0.21, p=0.24) and metastatic (1.80±0.44) versus non-metastatic disease (1.06±0.17, p=0.08). CONCLUSIONS: This ongoing work suggests variable GDF15 expression in different pediatric brain tumors and may suggest GDF15 mediates disease progression. GDF15 may play a role in metastatic or high-grade disease, but further study is needed with larger disease-specific cohorts. We demonstrate feasibility of utilizing existing genomic data and are pursuing further characterizing these potential differences through international public databases (i.e., Children’s Brain Tumor Network).