were confirmed by RNA-seq analysis. CONCLUSION: PD-L1+ pGBMs associated with CD3+CD8+ LYMPH infiltrates deserve further investigation as candidates for immunotherapy.

**IMMU-28. IMMUNOGENOMIC ANALYSIS RELATES LGALS1 TO THE IMMUNE HETEROGENEITY AND IMMUNOSUPPRESSION IN BRAIN TUMORS**

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Mutualistic and dynamic communication between tumour cells and the surrounding microenvironment accelerates the initiation, progression, chemoresistance and immune evasion of glioblastoma (GBM). However, the immunosuppressive mechanisms of GBM has not been thoroughly elucidated to date. We enrolled six microenvironmental signatures to identify glioma microenvironmental genes. The functional enrichment analysis such as ssGSEA, ESTIMATE algorithm, Gene Ontology, Pathway analysis is conducted to discover the potential function of microenvironmental genes. In vivo and in vitro experiments are used to verify the immuneologic function of LGALS1 in GBM. We screen eight glioma microenvironmental genes from glioma databases, and discover a key immunosuppressive gene (LGALS1 encoding Galectin-1) exhibiting obviously prognostic significance among glioma microenvironmental genes. Gliomas with different LGALS1 expression have different overall survival. Knockdown of LGALS1 remodels the GBM immunosuppressive micro-environment by down regulating M2 macrophages and myeloid-derived suppressor inhibiting, immune responses.

Our results thus implied an important role of microenvironmental regulation in glioma malignancy and provided evidences of LGALS1 contributing to immunosuppressive environment in glioma and that targeting LGALS1 could remodel immunosuppressive microenvironment of glioma.

**IMMU-29. AIF1 IS A PROGNOSTIC BIOMARKER AND CORRELATED WITH IMMUNE INFILTRATES IN GLIOMAS**

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Gliomas remain highly variable clinical behaviors, leading to emerging studies to identify prognostic factors. AIF1 (Allograft Inflammatory Factor 1) is critical for promoting both macrophage- and dendritic cells (DCs)-mediated inflammatory response and growth of vascular smooth muscle cells and lymphocytes. Through Comparative analytical and quantitative expression, we studied AIF1 expression in glioma databases, and discovered a predominate characteristic in GBMs with high expression of LGALS1 encoding Galectin-1 (LGALS1).

We screen the expression of AIF1 and their correlation with immune infiltration in glioma, and found that AIF1 expression has specific genomic variation spectrums. Immunosuppression is a predominant characteristic in GBMs with high expression of LGALS1 encoding Galectin-1 (LGALS1). Our results implied an important role of microenvironmental regulation in glioma malignancy and provided evidences of LGALS1 contributing to immunosuppressive environment in glioma and that targeting LGALS1 could remodel immunosuppressive microenvironment of glioma.

**IMMU-30. UPREGULATED T CELL AND INTERFERON-RELATED GENE EXPRESSION IS ASSOCIATED WITH INCREASED SURVIVAL IN RECURRENT PEDIATRIC HIGH-GRADE GLIOMA**

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Recurrent pediatric high-grade glioma (pHGG) is the leading cause of cancer-related mortality in children. Immunotherapy is a successful treatment approach for a growing number of cancers and is being investigated as a treatment strategy for pHGG. Immunotherapy has shown the most benefit in tumors with increased infiltrating T cells at baseline. Our recently published results revealed that neoadjuvant checkpoint inhibition in recurrent adult glioblastoma was associated with upregulation of a T cell and interferon-γ-related gene expression signature (Tcell-IFNγGES) and was correlated with a significantly extended overall survival (OS). In this study, we examined the immune landscape in recurrent pHGG and the association of Tcell-IFNγGES in the tumor with survival. We analyzed tumor RNAseq data collected at time of recurrence from a historical cohort of 42 pHGG patients from the Children’s Brain Tumor Tissue Consortium. We found a significant transcriptional enrichment of Tcell-IFNγGES in 54% of the tumors. The survival of patients with high Tcell-IFNγGES was observed to be significantly higher than patients with low Tcell-IFNγGES, (log-rank p<0.05). The 3-year OS for patients with low versus high Tcell-IFNγGES was 28.5% (95% CI: 13.7%-59.5%) compared to 50.2% (95% CI:33.1%-76.1%). When patients were stratified by age, gender and race, low Tcell-IFNγGES was found to be a poor OS prognostic factor (hazard ratio 2.4, (1.14–5.14), p<0.02). This indicates a strong relationship of decreased Tcell-IFNγGES and increased risk of death. Future investigations are necessary to validate these findings, and to explore the value of Tcell-IFNγGES as a predictive biomarker for response to immunotherapy in pHGG.

IMMU-31. PNOO007: H.3K27M SPECIFIC PEPTIDE VACCINE COMBINED WITH POLYCLonal FOR THE TREATMENT OF NEWLY DIAGNOSED HLA-A2+ H.3K27M DIFFUSE MALIGNANT GLIOMAS (DMG)
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OBJECTIVE: To assess safety and efficacy within a multi-center trial the H.3K27M specific peptide vaccine with poly-ICLC in HLA-A2+ H.3K27M-DMGs. METHODS: After focal radiation therapy, participants 3-21 years of age were enrolled into two strata. Stratum A: newly diagnosed diffuse intrinsic pontine glioma (DIPG); Stratum B: other DMGs. H.3K27M vaccine was administered with poly-ICLC IM every 3 weeks for 8 doses followed by every 6 weeks for a total of 56 weeks. Immunomonitoring of peripheral blood mononuclear cell (PBMC) and imaging occurred every 3 months. Modified iRANO criteria were applied. PBMC samples were evaluated by mass cytometry. RESULTS: From November 2016 until March 2019, 19 eligible patients (median age 11, range 5-17 years; 53% female) were enrolled in Stratum A and 10 eligible patients (median age 13, range 7-18 years; 60% female) in Stratum B. Treatment was well tolerated (7 grade 3; 0 grade 4 related toxicities). Median number of vaccines per participant was 6 (range 1-11). Overall survival at 12 months was 49% (95% CI:22–73%) for Stratum A and 39% (95% CI 16–93%) for Stratum B. Among the 19 subjects with longitudinal immune cell assessments, 7 exhibited an expansion of K27M-reactive CD8+ effector memory T-cells correlating with prolonged survival (p=0.082). CONCLUSION: H.3K27M specific vaccine in combination with poly-ICLC is well tolerated. CyTOF-based immune monitoring of PBMCs facilitates sensitive high-throughput analysis. Further investigation is warranted to determine if this may be predictive of clinical outcomes.

LOW GRADE GLIOMA

LGG-01. CLINICAL MANAGEMENT AND GENOMIC PROFILING OF PEDIATRIC LOW GRADE GLIOMAS IN SAUDI ARABIA
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Pediatric Low Grade Gliomas (PLGGs) display heterogeneity regarding morphology, genomic drivers and clinical outcomes. The treatment modality dictates the outcome and optimizing patient management can be challenging. In this study, we profiled a targeted panel of cancer-related genes in 37 Saudi Arabian patients with PLGGs to identify genetic abnormalities that can inform prognostic and therapeutic decision-making. We detected genetic alterations (GAs) in 97% (36/37) of cases, averaging 2.51 single nucleotide variations (SNVs) and 0.91 gene fusions per patient. The KIAA1549-BRAF fusion was the most common alteration (21/37) (1.14–5.14), p=0.02). This indicates a strong relationship of decreased Tcell-IFNγ and increased risk of death. Future investigations are necessary to validate these findings, and to explore the value of Tcell-IFNγ as a predictive biomarker for response to immunotherapy in pHGG.

LGG-02. A BRAIN TUMOR DIAGNOSED AFTER TRANSITION TO THE DEPARTMENT OF ADULT NEUROSURGERY FROM THE DEPARTMENT OF PEDIATRICS
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The patient was a 17-year-old boy with a history of 4 non-febrile convulsions at 15 and 16 years of age. He visited the Department of Pediatrics at a pediatric hospital. At 14 years of age he had a grand mal and focal status epilepticus. MRI showed right frontal cortical small tumor, with T1 low, T2 high, diffusion-weighted imaging low, and partial contrast enhancement. We diagnosed him with a brain tumor and symptomatic epilepsy. We surgically removed a right frontal cortical tumor. A pathological examination finally diagnosed the diagnosis of dysembryoplastic neuroepithelial tumor. MRI confirmed the total removal of the tumor. Anticonvulsant was started before surgery. No epileptic seizure was observed, so the anticonvulsant medication was gradually tapered and stopped at two years after the surgery. No epilepsy nor recurrence has been observed thus far. The problem with the initial management of this case at the Department of Pediatrics in the pediatric hospital was that the brain tumor was missed despite an MRI examination. Had the transition not occurred, this brain tumor would not have been diagnosed. We identified a GOC-P-ROS1 fusion that may be a biomarker for pLGG. Our study proves the possibility of using genetic profiling to guide optimal treatment strategies for pLGG in Saudi population.

LGG-03. INCIDENCE AND OUTCOME OF PEDIATRIC IDH-MUTANT GLIOMA
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INTRODUCTION: The incidence of IDH mutations in pediatric glioma is unclear. Recent publications suggest rates ranging between 0–20%.