a framework of the needs of family caregivers from which to create targeted dissemination plans.

4473

Immune control of plasma cell disorders – in-depth analysis of Sox2 immunity in MGUS

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OBJECTIVES/GOALS: We aim to identify and characterize anti-Sox2-specific CD8+ T cell responses in stable MUGS patients expressing HLA class I alleles-A*02:01 and /or -B*07:02. METHODS/STUDY POPULATION: Cross sectional study of patients with stable MGUS defined as stable serum paraprotein for ≥ 12 months from the MM Research Clinic at the Abramson Cancer Institute. Sox2 T cell reactivity will be assessed by IFN-γ ELISPOT assays. Rested PBMC will be pulsed with candidate Sox2-derived peptides predicted to display high affinity to HLA class I alleles and known to be processed and presented as determined by "targeted MS/MS" (mass spectrometry). The presence of anti-Sox2-specific CD8+ T cells will be confirmed in peptide/HLA multimer assays using flow cytometry. Anti-Sox2-specific CD8+ T cells will be characterized for HLA restriction and TCR αβ composition. RESULTS/ANTICIPATED RESULTS: Our work is still in progress. From Aug to Dec 2019, 22 MGUS subjects have been analyzed, 11 of which were found to have the HLA of interest. Positive Sox-2 reactivity by ELISpot was found in 3 subjects. DISCUSSION/SIGNIFICANCE OF IMPACT: Anti-Sox2 immune responses may maintain MGUS in a clinical indolent state by eliminating Sox2-expressing clonogenic MM cells. A detailed characterization of anti-Sox2 T cells followed by in-vivo assessment of their anti-myeloma activity could provide the foundation for a Sox2 based immunotherapy approach in MM.

4304

Immune markers in tumor immune microenvironment of neuroblastoma correlate with risk groups

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OBJECTIVES/GOALS: Neuroblastoma (NB) is the most common extra-cranial solid tumor with outcomes varying from spontaneous regression to metastatic with high mortality rates. The tumor immune microenvironment (TIME) may play a significant role in this disease. In this study we analyze the TIME comparing high-risk (HR) and low-risk (LR) NBs using multiplex platforms. METHODS/STUDY POPULATION: Two tissue microarrays (TMAs) with 2mm cores were created from 41 patients treated at Columbia University Irving Medical Center. Five micron TMA slides were stained for Digital Spatial Profiling (DSP, nanoString) and multiplex immunofluorescence (mIF). For DSP, a 24-patient subset including 11 HR, 8 LR and 4 intermediate risk patients was analyzed for 34 proteins. Protein expression among risk groups was compared using Mann-Whitney t-test. For mIF, TMA FFPE slides were stained for DAPI, CD3, CD8, CD68, HLA-DR, PDL1 and Chromogranin A. Whole TMA cores were captured as 9 -20X multispectral images (MSIs) stitched into a 3x3 MSI using Vectra (Akoya). MSIs were processed with inForm and qualitative analysis performed comparing HR and LR tumors. RESULTS/ANTICIPATED RESULTS: With DSP, we find significantly more HLA-DR in HR compared to LR tumors ($p = 0.016$). When controlling for immune cells with CD45 we find HLA-DR/CD45 to be higher in HR than LR tumors ($p = 0.026$). We found increased PD1 and PDL1 expression in all groups without significant difference between LR and HR ($p = 0.778$ and $p = 0.310$, respectively). Preliminary analysis of mIF on 9 patients (4 HR and 5 LR) finds HR tumors appear to have more immune cells than LR tumors, specifically more CD3+CD8- T cells while total CD8+ cells may be similar. There may be less macrophages in the HR compared to LR tumors. Completion of image processing and quantitative analysis of mIF data is underway. DISCUSSION/SIGNIFICANCE OF IMPACT: Increased expression of immune markers in NB TIME correlates with higher risk, which is unlike many other tumors. We compared TIME in HR and LR NB using multiplex platforms, DSP and mIF. We find that HLA-DR is more expressed in HR NB while PD1 and PDL1 expression is consistently high and not different between risk groups. Further analysis is underway. CONFLICT OF INTEREST DESCRIPTION: Robyn D. Gartrell-Corrado received grant support from nanoString for Digital Spatial Profiling and received honoraria and travel support from Northwest Biotherapeutics and PerkinElmer, respectively.

4396

Immunoglobulin administration and hypogammaglobulinemia during pediatric acute leukemia therapy

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OBJECTIVES/GOALS: Intravenous immunoglobulin (IVIG) is used for infection prevention in pediatric B-cell acute lymphoblastic leukemia (B-ALL), but evidence for this is lacking. We describe the prevalence of hypogammaglobulinemia in pediatric B-ALL, predictors of IVIG use and its efficacy for infection prevention. METHODS/STUDY POPULATION: We will conduct a retrospective review of children age 1-21 years with B-ALL treated at Aflac Cancer and Blood Disorders Center from 2010 to 2017. The cohort was identified through the cancer registry. Demographics, disease factors, laboratory values, medications and infection outcomes were linked between the electronic medical record and an institutional database. Outcomes of interest include emergency department (ED) visits, hospitalization days, and episodes of infection. Descriptive statistics will be performed. Outcomes will be compared between IVIG recipients and non-recipients. Univariate and multivariate logistic regression models will assess predictors of IVIG administration. RESULTS/ANTICIPATED RESULTS: We identified 443 patients with B-ALL during the study period who met inclusion criteria. Exclusion criteria included receipt of IVIG or hematopoietic stem cell transplant prior to diagnosis. The average age at diagnosis is 6.5 years (standard deviation 4.8 years); 52.6% are male; 61.6% are white; 61.0% are standard risk per National Cancer Institute criteria. Among eligible patients, 137 (31.1%) received IVIG. We hypothesize that IVIG initiation is associated with hypogammaglobulinemia and history of severe infection. We also anticipate that frequency of emergency department visits, hospitalization days, and episodes of infection will decrease after IVIG

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initiation. DISCUSSION/SIGNIFICANCE OF IMPACT: The immunological profile of children with B-ALL and factors influencing their susceptibility to infection are still incompletely understood. The benefits of IVIG are unknown. This study will provide evidence for IVIG prophylaxis recommendations in pediatric leukemia patients.

4355

Impact of Demographic & Racial Differences on DNA Repair Capacity in Lung Cancer

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OBJECTIVES/GOALS: Lung cancer is the leading cause of cancer-related mortality in the United States for both men and women. African Americans are disproportionately affected with lung cancer, having higher incidence and mortality rates compared to Caucasian men and women. African American smokers are diagnosed with lung cancer at a lower age with lower cumulative smoking history. Differences in socioeconomic and environmental factors likely contribute to lung cancer disparities, but less is known about acquired biologic alterations that can promote initiation and progression of lung cancer, particularly in African Americans. This is of interest because there may be other biological, genetic, or environmental factors contributing to lung cancer outcomes as it relates to differences in gender and race. One potential biologic variable may be in the DNA repair capacity (DRC), which describes a cell's ability to repair damage to DNA caused by carcinogens, oxidants, and radiation. Altered DNA repair is a hallmark of cancer, leading to mutations and malignant transformation. We hypothesize that DRC is decreased in African Americans with lung cancer compared to Caucasian Americans with lung cancer, contributing to the disparity that exists in this racial group. We will 1) perform a retrospective chart review to determine demographic differences between African Americans and Caucasians at three central Indiana hospitals and 2) determine the impact of race and lung cancer on DRC amongst African Americans and Caucasians with and without lung cancer. METHODS/STUDY POPULATION: Lung cancer patients are identified in 3 central Indiana hospitals with different payer source and patient populations using ICD codes. Collected demographics include age, gender, pack-years, lung cancer histology, treatment, and mortality. DRC is measured by host-cell reactivation (non-homologous end-joining and nucleotide excision repair pathways) by flow-cytometry. Measurement of DRC is performed on PBMCs obtained from 120 patients (male and female, African Americans and Caucasians with and without lung cancer). Correlation of DRC and lung cancer will be determined by comparing lung cancer diagnosis to quartile DRC, and adjusted for confounders (measured demographics). Correlative measures will include measures of DNA damage and genomic instability. RESULTS/ANTICIPATED RESULTS: 3450 lung cancer patients were diagnosed with lung cancer at Indiana University Hospital between 1/1/2000 – 5/31/2015. Of these, 48.2% were female and 92.7% smokers. African Americans, Caucasians and Other ethnicities represented 12%, 86% and 2%, respectively. Of smokers, 11.4% were African American. The primary payer source was Federal/Medicare. Retrospective review of lung cancer patients from two additional health systems (county and VA hospitals) will be performed as above with outcomes measured. DRC and additional correlative measures will be performed as in Methods. DISCUSSION/SIGNIFICANCE OF IMPACT: If present, altered DRC in African Americans compared to Caucasians may contribute to the disproportional impact of lung cancer on African Americans. If DRC is decreased in African Americans with lung cancer, future studies will focus on identifying potential genetic, epigenetic and environmental causes for this decrease.

4020

Impact of Patients' Health Literacy Level on Patients' Health Outcomes

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OBJECTIVES/GOALS: The objective of this study is to examine the relationship between gastro-intestinal (GI) patients' health literacy levels and patients' health outcomes (length of stay, readmission, complication). METHODS/STUDY POPULATION: A research team at the University of Alabama at Birmingham (UAB) 's Gastro-Intestinal (GI) surgical department collected inpatient GI patients' health literacy data by distributing the Brief Health Literacy Screen (BRIEF) survey to patients are about to be discharged. Patients' health outcomes data were gathered through Business Objects, an online platform that allows physicians and researchers to access and gather patients' medical information with an IRB approval. After accounting for necessary control variables, logistic regression and multiple linear regression models will be run to assess whether there is a significant relationship between patients' health literacy levels and patients' health outcomes. RESULTS/ANTICIPATED RESULTS: Three specific hypotheses are proposed in this study. H1: GI patients' health literacy levels will be negatively associated with their lengths of stay H2: GI patients' health literacy levels will be negatively associated with their readmission status to the hospital H3: GI patients' health literacy levels will be negatively associated with their complication status to the hospital DISCUSSION/SIGNIFICANCE OF IMPACT: This study allows us to further our understanding of patients' health literacy level and its' relationship with important health outcomes. By looking at a variety of diverse health outcomes, the impact of a patients' health literacy level on that patients' health outcomes will be observed more clearly.

4162

Improving Data Capacity and Predictive Capability of NSQIP-P Using Designed Sampling from Databases

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OBJECTIVES/GOALS: Designed sampling from databases (DSD) methods have been used to cross-check electronic medical records for errors, structure study design, and, we hypothesize, can be used to make data collection for surgical quality metrics more efficient, particularly within national databases. We plan to apply statistical and DSD methods to accomplish the following aims:

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