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Psychotropic Medication Use Before Cancer Diagnosis Among US Adolescents and Young Adults†

Oluwadamilola Onasanya[1], Susan dosReis[1] and Wendy Camelo Castillo[1]
[1]University of Maryland School of Pharmacy, Baltimore

OBJECTIVES/GOALS: To describe the prevalence of, and factors associated with, psychotropic medication use before cancer diagnosis (solid tumor cancer, lymphoma or leukemia) among AYAs 15 to 39 years of age in the US. METHODS/STUDY POPULATION: Retrospective cohort study in a 10% sample of claims from the IQVIA PharMetricsÂ® Plus for Academics (2006-2020). We included AYAs with no prior cancer diagnosis codes 9 months before their index date – defined as the first of â‰¥2 ICD-9/10-CM primary diagnosis codes for cancer occurring â‰¤60 days apart. We defined psychotropic use as a claim for an antidepressant, anxiolytic/sedative-hypnotic, mood stabilizer, stimulant or antipsychotic medication. Prevalence of psychotropic use overall and by class, was estimated as the proportion of AYAs with at least one claim for a psychotropic in the 9-months prior to the index date. Using Chi-square and T-tests, we compared demographic characteristics, prevalence of mental health disorders, chronic pain and cancer type between psychotropic users and non-users. RESULTS/ANTICIPATED RESULTS: We identified 6,257 AYAs with cancer (thyroid 17%, breast 13%, melanoma 13%), 64% female, mean age 31 (SD 6) years. Twenty-four percent (n=1,506) used a psychotropic in the 9 months prior to the index date. Psychotropic classes used were antidepressants 15%, anxiolytic/sedative-hypnotics 11%, stimulants 3%, mood stabilizers 2% and antipsychotics 1%. Psychotropic use was higher among females than males (27% vs 19%, p <.001), older than younger AYAs (35 to 39 years-old: 26% vs 15 to 19 years-old: 16%, p <.001). Anxiety (25% vs 4%), depression (22% vs 3%) and chronic pain (17% vs 8%) were more common among those with psychotropic use pre-cancer diagnosis (all p <.001). The proportion of AYAs diagnosed with brain cancer was higher among psychotropic users than non-users (7% vs 5%, p <.001). DISCUSSION/SIGNIFICANCE: One in four US AYAs used a psychotropic medication prior to being diagnosed with cancer. Understanding psychotropic medication management patterns for these patients before cancer treatment may help inform comprehensive care.

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Analysiss of TNBC Cell Lines Cultured a Novel Translational Breast Cancer Microphysiological System (BC-MPS)*

Katherine L. Hebert[1], Khoa Nguyen[1], Thomas Cheng[1], Madlin Alzoubi[1], Steven Elliott[1], Bridgette Collins-Burow[1], Elizabeth Martin[2],Frank Lau[3] and Matthew Burow[1]
[1]Tulane University, [2]Louisiana State University and [3]Louisiana State University Health Sciences Center

OBJECTIVES/GOALS: Current approaches to drug development for the aggressive triple negative breast cancer rely on current 2D and 3D in vitro models which have limited capabilities. We have developed a translational microphysiological system that can maintain the human breast microenvironment to capture the complex interaction with the tumor microenvironment. METHODS/STUDY POPULATION: Three different TNBC cell lines were seeded in BC-MPS: MDA-MB-231 parental cell line, MDA-MB-231wiht the gene, LKB1 overexpressed, which is a tumor suppressor, and MDA-MB-231 with the enzyme, ERK5, an enzyme associated with increased metastasis and drug resistance, knocked out. These three TNBC cell lines were cultured in a standard 2D 96-well plate and in BC-MPS. Time-lapse videos were taken to track cellular mobility. RNA-sequencing was performed to compare different expression levels of various cancer related genes of the cell lines cultured in standard 2D and BC-MPS. RESULTS/ANTICIPATED RESULTS: The LKB1 overexpressed MDA-MB-231 and the ERK5-ko MDA-MB-231 cell lines are expected to have decreased mobility compared to the parental cells. The cell lines are expected to have increased expression of cancer related genes when cultured in BC-MPS than when cultured in standard 2D due to the presence of human breast tissue. DISCUSSION/SIGNIFICANCE: BC-MPS is a promising new translational MPS that facilitates studying long term interactions between real human breast tissue and cancer cells. The BC-MPS systems ability to support the growth of established cell lines has been demonstrated. Future studies will focus on developing the model for personalized medicine.

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Optimizing Haploidentical Donor Selection for Pediatric Hematopoietic Cell Transplant

Nicole Liberio[1], Bronwen Shaw[1], Greg Yanik[2], Muna Qayed[3], Kirk Schultz[4] and Larisa Broglie[1]
[1]Medical College of Wisconsin, [2]University of Michigan, [3]Children's Healthcare of Atlanta at Egleston and [4]British Columbia's Children's Hospital, The University of British Columbia

OBJECTIVES/GOALS: Patients who require a hematopoietic cell transplant (HCT) and dont have an HLA-matched related or unrelated donor may rely on a haploidentical donor. The optimal haploidentical donor and guidance for selection is limited. We aim to determine how donor characteristics affect outcomes following haploidentical-HCT for pediatric patients. METHODS/STUDY POPULATION: This is a retrospective cohort study evaluating the effect of donor age and relationship on post-HCT outcomes in children (0-18y) from 2008-2018. Multivariable logistic regression analysis will identify if donor age or donor relationship affect the development of graft-versus-host-disease (GVHD), while adjusting for other patient, donor, and transplant related variables. Two-year overall survival & event-free survival will be determined using Kaplan-Meier curves, stratified by donor age group and donor relationship, and compared by log-rank testing. Sub-analyses will be performed for myeloablative transplants and reduced intensity conditioning, as well as for malignant and non-malignant diseases. RESULTS/ANTICIPATED RESULTS: Our primary aim to is determine the effect of donor age and the effect of donor relationship to patient on the development of GVHD. We hypothesize that utilization of a younger donor will decrease the incidence of GVHD. Further, we hypothesize that utilizing a sibling haploidentical donor will result in less GVHD than a parental donor. Secondary aims include evaluating the effect of donor age and donor relationship on overall survival, event-free survival, non-relapse mortality, relapse, graft failure and time to engraftment. The results of this study will help us to develop criteria for optimal haploidentical donor selection. If donor selection is optimized, this could result in improved outcomes following haploidentical transplants. DISCUSSION/SIGNIFICANCE: Haploidentical donors are increasingly used as many patients, especially ethnic minorities, do not have

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