

influence risk of memory decline across these cognitive phenotypes.

**Categories:** Epilepsy/Seizures

**Keyword 1:** epilepsy / seizure disorders

**Keyword 2:** memory disorders

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## 5 The impact of recreational cannabis use on neuropsychological function in epilepsy

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**Objective:** Cannabis is classified as a class B drug in the UK with penalties for possession of up to 5 years in prison, an unlimited fine or both. Nevertheless it is widely available and is the most commonly used drug in the UK with approximately 2.6 million (7.6%) of adults reporting that they sometimes or regularly use it. It is not uncommon for people who present in our epilepsy clinic to report regular use of cannabis; some use it recreationally whilst others report 'self-medicating' based on the belief that it has a beneficial impact on their seizures. The aim of this study was to establish the prevalence of cannabis use in people with epilepsy referred for a neuropsychological assessment and to examine the impact of cannabis use on cognitive function in this group.

**Participants and Methods:** All patients who attend for a neuropsychological assessment are routinely asked about illegal drug use in their clinical interview. This information is also captured in the medical and neuropsychiatric assessments they undergo when assessed by the multidisciplinary team. The electronic medical records of 800 consecutive patients who had undergone a neuropsychological assessment between 2019 and 2022 were searched for references to cannabis use. The neuropsychological profiles of patients reporting cannabis use were compared to those seen in the larger series across multiple cognitive domains.

**Results:** Seventy (8.75%) of the patients in the series reported past or present cannabis use.

Cannabis users were more likely to be male ( $p < 0.01$ ) and were younger ( $p < 0.01$ ) than those who did not report use. Reading IQ was significantly lower in the cannabis group ( $p < 0.001$ ). Patients who were regularly using cannabis at the time of the neuropsychological assessment did not differ from the rest of the cohort on tests of processing speed, working memory, naming or verbal fluency. There were no differences between the groups in their performance on an embedded measure of performance validity. However the patients who were regularly using cannabis at the time of their neuropsychological assessments scored significantly lower on tests of verbal learning ( $p < 0.05$ ) and reported significantly greater subjective memory problems in everyday life ( $p = 0.02$ ) than the non-cannabis group. The group using cannabis also scored significantly more highly on the depression ( $p < 0.01$ ) and anxiety scales ( $p = 0.02$ ) on the Hospital Anxiety and Depression Scale.

**Conclusions:** The prevalence and patterns of cannabis use in the epilepsy population mirror those seen in the wider population. The impact on regular cannabis use on neuropsychological function appears to be most evident on measures of new learning and subjective measures of memory disturbance. Cannabis use is significantly associated with lower levels of cognitive reserve and elevated levels of anxiety and low mood. Whilst caution must be employed with respect to any direct attribution in these complex clinical presentations, these findings may be helpful in the interpretation of neuropsychological test scores and the planning of interventions, particularly with respect to subjective memory complaints in this group.

**Categories:** Epilepsy/Seizures

**Keyword 1:** memory complaints

**Keyword 2:** cannabis

**Keyword 3:** epilepsy / seizure disorders

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## Paper Session 07: Cancer in pediatric populations

2:15 - 3:45pm

Thursday, 2nd February, 2023

Pacific Ballroom E

Moderated by: Sakina Butt

## 1 Ototoxicity and Cognitive Outcomes among Children Treated for Brain Tumors in Infancy

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**Objective:** Treatment of childhood central nervous system (CNS) tumors can lead to sensorineural hearing loss (SNHL), with prior research indicating associations between SNHL and cognitive difficulties. Infants (0-3 years) treated for CNS tumors are at particular risk for neurocognitive deficits due to increased vulnerability of the developing brain and missed developmental opportunities secondary to prolonged treatment. This study expands upon existing research by examining the association between treatment-related SNHL and later neurocognitive outcomes among infants.

**Participants and Methods:** Serial audiology and neurocognitive assessments were conducted as part of a prospective, multisite, longitudinal trial (SJYC07). Children with newly diagnosed CNS tumors were treated with chemotherapy, with or without focal proton or photon radiation therapy (RT). SNHL was dichotomized based on hearing in the better ear as present versus not present (Chang grade  $\geq 1a$  vs.  $< 1a$ ). Neurocognitive assessments included intellectual functioning (IQ), and parent ratings of executive functioning and behavioral functioning. Demographic and clinical variables investigated included: sex, age at diagnosis (years), treatment type (chemotherapy only vs. chemotherapy + RT), risk group (low vs. intermediate vs. high), and socioeconomic status (SES, continuous). Logistic regression models were used to identify factors associated with SNHL. Change point longitudinal models were used to examine the effect of each covariate individually and the potential impact of SNHL on trajectories of neurocognitive outcomes.

**Results:** Of 135 patients (median age at diagnosis= 1.5 years), 67% had mild-to-severe

SNHL as defined by Chang grade  $\geq 1a$  at last follow-up. SNHL occurred early after treatment with a 1-year cumulative incidence  $63.0\% \pm 4.3\%$ . SNHL was associated with age at diagnosis ( $p < .001$ ) but not sex, treatment exposure or study risk arm ( $p > .10$ ). At pre-treatment baseline, IQ was associated with age at diagnosis (older age= higher IQ) and SES (higher SES= higher IQ) with a change in the trajectory of IQ after SNHL (stable prior to SNHL and declined 1.46 points/year after SNHL), which was impacted by tumor location (patients with supratentorial tumors stable prior to SNHL and declined 2.84 points/year after SNHL; whereas, patients with infratentorial tumors increased 1.93 points/year prior to SNHL and were stable after SNHL). At pre-treatment baseline, adaptive functioning was associated with age at diagnosis (older age= higher skills) with a change in adaptive functioning after SNHL that varied by age. There was a change in trajectory of attention problems (stable before SNHL and worsening 1.39 points/year after SNHL). SNHL was not associated with parent report of emerging executive functioning.

**Conclusions:** Children with brain tumors experience SNHL and cognitive difficulties early in treatment that can worsen over time. Younger age at diagnosis is associated with greater risk for SNHL and cognitive difficulties. Analyses of the time course between the emergence of SNHL and cognitive late effects suggests even mild SNHL is associated with a clinically significant decline in IQ and attention problems. These findings have notable implications with respect to refining monitoring guidelines, informing modifications to treatment, advocating for interventions, and helping educate parents, teachers, and providers about the significant impact of mild SNHL.

**Categories:** Acquired Brain Injury (TBI/Cerebrovascular Injury & Disease - Child)

**Keyword 1:** cancer

**Keyword 2:** neuro-oncology

**Keyword 3:** quality of life

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## 2 Cognitive Sparing in Proton Versus Photon Radiotherapy for Pediatric Brain