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Objective: Patients with temporal lobe epilepsy (TLE) commonly show memory deficits on neuropsychological tests. The BVMT-R is a widely used test of visual learning and memory that involves accurately reproducing an array of figures in the correct spatial location. The present study examined performance processes of visual memory in presurgical patients with TLE, including item (i.e., accuracy) and associative memory (i.e., location), which have been shown to be dissociable in studies of visual memory in other neurologic populations.

Participants and Methods: Participants included nine patients with left TLE (67% female; 67% left-handed; mean age = 46.15 years, range = 24-55; mean education = 14.8 years, range = 9-18) and six patients with right TLE (17% female; 33% left-handed; mean age = 57.64 years, range = 22-62; mean education = 15.52 years, range 11-18). Mean duration of epilepsy was 19 years. Participants had an average of two failed anti-seizure medications prior to surgery. TLE groups were compared to 22 healthy controls (36% female; 14% left-handed; mean age = 33.68 years, range = 22-53; mean education = 17.66 years, range = 16-20). All participants completed comprehensive neuropsychological testing at a large Northeastern medical center. The BVMT-R was scored using standard and novel scoring paradigms. All data were retrospectively reviewed from archival datasets.

Results: MANCOVA results indicated a significant multivariate main effect for group membership and standard BVMT-R scoring after controlling for level of education, Wilks' $\Lambda = 0.59$, $F(4, 64) = 4.91$, $p = .002$. The multivariate partial eta squared (η^2) of .58 indicated a strong relationship between group membership and both immediate and delayed recall, with the control group performing better overall. The TLE groups did not perform significantly different from each other. A significant multivariate main effect for group and novel BVMT-R scoring was found (also controlling for education), Wilks' $\Lambda = 0.42$, $F(8, 58) = 3.97$, $p = .001$. Overall, the

control group demonstrated better item learning with no significant difference between TLE groups observed. Both the control ($M = 16.5$, $SD = 2.04$) and left TLE ($M = 12.33$, $SD = 4.03$) showed stronger associative learning compared to the right TLE group ($M = 10.2$, $SD = 4.27$). For item and location delayed recall, controls ($M = 4.82$, $SD = 1.62$) had more accurate recall compared to left TLE ($M = 1.56$, $SD = 2.04$) with a trend toward better performance compared to the right TLE patients ($M = 2.6$, $SD = 1.82$); the TLE groups performed similarly. No difference was observed for associative delayed recall between the three groups.

Conclusions: Patients with right TLE showed worse associative learning compared to left TLE, while performance was generally comparable to their right TLE counterparts on other novel BVMT-R scoring paradigms. Unsurprisingly, patients with TLE performed worse on BVMT-R using standard scoring procedures, though no lateralizing effect was observed. While these findings suggest that associative visual learning weakness may be characteristic of right TLE, findings should be interpreted cautiously the given small sample size and demographic considerations (i.e., uneven gender distribution, lack of data on ethnicity/race).

Categories: Epilepsy/Seizures

Keyword 1: epilepsy / seizure disorders

Keyword 2: neuropsychological assessment

Keyword 3: visuospatial functions

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32 Prediction of Seizure Outcome with Presurgical IAT, MRI, and PET in Patients with Temporal Lobe Epilepsy Undergoing Surgery

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Objective: Anterior temporal lobectomy is a common surgical approach for medication-resistant temporal lobe epilepsy (TLE). Prior studies have shown inconsistent findings regarding the utility of presurgical intracarotid sodium amobarbital testing (IAT; also known as Wada test) and neuroimaging in predicting postoperative seizure control. In the present study, we evaluated the predictive utility of IAT, as well as structural magnetic resonance imaging (MRI) and positron emission tomography (PET), on long-term (3-years) seizure outcome following surgery for TLE.

Participants and Methods: Patients consisted of 107 adults (mean age=38.6, SD=12.2; mean education=13.3 years, SD=2.0; female=47.7%; White=100%) with TLE (mean epilepsy duration =23.0 years, SD=15.7; left TLE surgery=50.5%). We examined whether demographic, clinical (side of resection, resection type [selective vs. non-selective], hemisphere of language dominance, epilepsy duration), and presurgical studies (normal vs. abnormal MRI, normal vs. abnormal PET, correctly lateralizing vs. incorrectly lateralizing IAT) were associated with absolute (cross-sectional) seizure outcome (i.e., freedom vs. recurrence) with a series of chi-squared and t-tests. Additionally, we determined whether presurgical evaluations predicted time to seizure recurrence (longitudinal outcome) over a three-year period with univariate Cox regression models, and we compared survival curves with Mantel-Cox (log rank) tests.

Results: Demographic and clinical variables (including type [selective vs. whole lobectomy] and side of resection) were not associated with seizure outcome. No associations were found among the presurgical variables. Presurgical MRI was not associated with cross-sectional (OR=1.5, $p=.557$, 95% CI=0.4–5.7) or longitudinal (HR=1.2, $p=.641$, 95% CI=0.4–3.9) seizure outcome. Normal PET scan (OR= 4.8, $p=.045$, 95% CI=1.0–24.3) and IAT incorrectly lateralizing to seizure focus (OR=3.9, $p=.018$, 95% CI=1.2–12.9) were associated with higher odds of seizure recurrence. Furthermore, normal PET scan (HR=3.6, $p=.028$, 95% CI =1.0–13.5) and incorrectly lateralized IAT (HR= 2.8, $p=.012$, 95% CI=1.2–7.0) were presurgical predictors of earlier seizure recurrence within three years of TLE surgery. Log rank tests indicated that survival functions were significantly different between patients with normal vs. abnormal PET and incorrectly vs. correctly lateralizing IAT such that these had seizure relapse five and seven months earlier on average (respectively).

Conclusions: Presurgical normal PET scan and incorrectly lateralizing IAT were associated with increased risk of post-surgical seizure recurrence and shorter time-to-seizure relapse.

Categories: Epilepsy/Seizures

Keyword 1: epilepsy / seizure disorders - surgical treatment

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33 Pre-Surgical Evaluation of Bilingual Epilepsy Patients; A Case Study Demonstrating the Importance of Bilingual Assessment

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Objective: In the US, >20% of individuals aged 5 years and older speak a language other than English at home, with rates of bi- and multilingualism increasing. Providing linguistically- and culturally- competent care to increasingly diverse populations is a necessary task for neuropsychologists. The need for close attention to bilingualism is even more glaring in the context of neurosurgical interventions, such as in intractable epilepsy. Pre-surgical epilepsy evaluations serve as a baseline for post-surgical change, inform lateralization and localization, and help determine cognitive risks associated with surgery. The importance of evaluating bilingual status and assessing cognitive abilities in both languages, if needed, in presurgical epilepsy evaluations is examined. We present the neuropsychological profile of a 10-year-old bilingual male with intractable epilepsy participating in a pre-surgical epilepsy evaluation.

Participants and Methods: This right-handed male is a sequential language learner, exposed to Spanish at birth and English when he began kindergarten. His parent reported he was primarily English speaking. Developmental milestones were met within expected