Diurnal Mood Variability Following Anterior Temporal Lobectomy

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ABSTRACT

Findings of mood-related laterality effects following anterior temporal lobectomy (ATL) have been inconsistent at best. Although previous studies have examined mood at isolated points in time post-surgery, this approach provides little information about intrinsic diurnal variability. In the current study, we explored for the first time whether “variability” in emotional reactivity would be more associated with right versus left ATL.

METHODS. Twelve patients with unilateral ATL completed multiple measures of stress and mood, 5 times a day over the course of 5 days. Mood measures included ratings of stress, affect intensity, and valence using Likert scales. Patients completed ratings in their home environment at predetermined times relative to wakening. To index variability in daily mood, we calculated daily standard deviations for each patient on each measure. These data were analyzed using repeated measures ANOVA.

RESULTS. The Right ATL group showed significantly more variability in their daily ratings of stress and affect intensity than the Left ATL group. These findings were not due to differential use of antidepressants or seizure medications with mood-stabilizing effects (i.e., Depakote, Lamictal) or the occurrence of seizures. The two groups did not differ on valence ratings or a standard depression measure (Beck).

CONCLUSIONS. This is the first report that Right ATL patients display greater diurnal mood variability than Left ATL patients. Potential factors underlying this difference will be discussed including the possibility of lateralized alteration of hippocampal systems involved in HPA feedback regulation.

BACKGROUND

Research and clinical findings suggest that emotional changes are not uncommon following anterior temporal lobectomy (ATL) for intractable epilepsy. Currently much of the research has focused on the presence of psychopathology such as depression or mood-related laterality effects following surgery. Although several studies have found increased negative affect associated with left rather than right ATL (e.g. Heilman & Bowers, 1984; Burton & Labar, 1999), the overall literature has been relatively inconsistent. Further, studies have generally focused on examining mood at isolated timepoints (e.g. 1-month post surgery, 6-months post surgery). To our knowledge, no studies have examined variability in mood over time, or more specifically, intrinsic diurnal variability, in ATL patients. Given that mood is not static, examining diurnal variability may give a more thorough description of emotional experience. In the current study, we explored for the first time whether “variability” in emotional reactivity would be more associated with right versus left ATL.

RESULTS

• The right ATL group showed significantly more variability in their daily ratings of stress (F = 8.15, p = 0.017) and mood intensity (F = 10.19, p = 0.010) compared to the left ATL group.

• Differences between groups for mood valence were not significant (F = 2.02, p = 0.186).

• Differences between groups for mood valence were not significantly related to mood variability: age, time since surgery, or use of anti-depressants or medications with mood stabilizing effects. However, more right ATL patients were still experiencing seizures post surgery than left ATL patients.

• The following variables were not significantly related to mood variability: age, time since surgery, BDI scores, use of anti-depressants, seizure control, and Engle rating.

CONCLUSION

• Right ATL patients displayed greater diurnal mood variability than left ATL patients.

• Diurnal mood variability was not related to patient age, time since surgery, seizure control, Engle rating, BDI scores, or use of anti-depressants.

• Laterality effects may suggest that the right temporal lobe systems have a special role in influencing stress reactivity and mood.

• Analyzing standard deviations of repeated mood measures is a useful and unique way to study emotional changes in epilepsy patients.