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CORRESPONDENCE

Letter to the Editor

RE: Douglas Labar, Leo Dilone, Gail Solomon & Cynthia Harden. Epileptogenesis: left or right hemisphere dominance? Preliminary findings in a hospital-based population. *Seizure* 2001; **10**:570-572.

Dear Mr. Betts,

Epileptogenesis: left to right hemisphere dominance? Preliminary findings in a hospital/based population by Labar *et al.* adds to previous studies that show a greater number of left-sided EEG abnormalities in patients with seizures[1,2] by further showing that patients from an Epilepsy Center more frequently have left-sided seizure foci[3].

The authors do not believe their results to be attributable to a left hemisphere dysfunction more likely to arouse attention, and they suggest that right-sided cases seek medical attention eventually. Unless patients consistently secondarily generalize and come to medical attention because of tonic–clonic seizures, I am not convinced that right-sided cases of pure partial epilepsy come equally to medical attention. Although the authors state that they 'believe that the same neuronal mechanisms that gave rise to hemispheral functional differences endow the left hemisphere with a higher propensity for developing abnormal excess neuronal excitability', their belief notwithstanding, I am unaware of evidence to suggest this translates into a greater susceptibility for epileptogenicity.

In trying to understand the significance and implication of such levo-lateralized findings, at least two considerations should be addressed: (1) Is there an inherent referral bias in patients sent for EEG, when the reason for referral is to query the possibility of seizures? Patients with receptive language or language output problems when present interictally, ictally or post-ictally, may well come to clinical attention more frequently than those patients with non-dominant hemisphere phenomenology, thus favoring the referral of patients with left-sided foci. This the authors note. The authors' suggestion that left hemisphere epilepsy may be over-represented in epilepsy clinics when refractory, because they are 'more severe and require more medical attention, thereby appearing more frequently in our series' is a cogent suggestion for the finding in their series, particularly if the reasons for which patients seek ongoing medical attention derives from their problems of verbal communication, reading and social integration, so much of which depends on left hemisphere function. (2) It would also follow that patients with left-sided foci would perforce be more likely to have seizures originating in the same (left) hemisphere—clearly determination of lateralization will only be done on those patients *referred* to the laboratory, and those with left-sided foci will more likely have left-sided seizures. Independent of the particular characteristics of the ictal phenomenology that would favor recognition of left-sided foci over right, and further, recognizing that there are relative degrees of epileptogenicity among different brain regions within one hemisphere, a possible model that would enable examination of *intrinsic* lateralized epileptogenicity of homologous brain regions would be one derived from a lateralized genetic epilepsy *without* structural underpinnings (i.e. cryptogenic or symptomatic). Such a model might be benign epilepsy with centro-temporal spikes (rolandic epilepsy).

Using this epilepsy as a model to investigate the lateralization hypothesis (and again realizing the inherent possibility of referral bias), our laboratory looked at the lateralization of epileptic foci in children referred for a tonic–clonic seizure, in which rolandic spikes were found on EEG. In the 20 EEGs in 25 patients referred by our laboratory (nine girls, 16 boys age range 2–12 years), five were left-sided, eight were right-sided, 12 were bilateral, thus revealing (if anything) a slight right-sided predominance[4]. Using published data from several large series in which EEG lateralization of rolandic foci is provided, an equal right–left prevalence was found (77 (right); 76 (left); 20–62.5% (bilateral) (Table 1)). At least as far as this genetic model is concerned, there seems to be *no* inherent increased epileptogenicity attributable to the left hemisphere. True, the presence of a lateralized rolandic focus may not be the particular origin of that particular patient's generalized convulsion, but it is also as good a guess as any. It is also true that other pathologies such as mesiotemporal sclerosis, extra-temporal epilepsies or other neocortical foci may

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Table 1: Lateralization of discharges in patients with benign epilepsy with centro-temporal spikes.

Author	No. of cases	Unilateral			Bilateral
		Left	Right	Total	
Beaumanior *et al.* (1974)	26	3	7	10	16
Heijbel and Bohman (1975)	16	5		5	11
Lerman and Kivity (1975)	100	34	28	62	38
Cavazzutti *et al.* (1980)	38	18	9	27	11
Gregory and Wong (1984)	10	2	6	8	2
Kabiraj *et al.* (1997)	36	9	19	28	8
Kaplan and Ming (1997)	25	5	8	13	12
Total	251	76	77	153	98

derive from disease processes which do lateralize, but I think until we resolve the intrinsic problems of referral bias, ascertainment bias, and phenomenological recognition bias, that the jury is still out as to a difference in intrinsic hemisphere epileptogenicity. Political considerations aside, I don't believe nature favors the left.

Yours sincerely,

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REFERENCES

1. Defacio, G., Lepore, V., Specchi, L., Pisiani, F. and Livera, P. The effect of EEG focus laterally on efficacy of carbamazepine in complex partial and secondarily generalized tonic–clonic seizures. *Epilepsia* 1991; **32**: 706–711.
2. Paolozzi, C. Hemispheric dominance and asymmetry related to vulnerability of cerebral hemisphere. *Acta Neurologica (Italy)* 1969; **24**: 13–28.
3. Labar, D., Dilone, L., Solomon, G. and Harden, C. Epileptogenesis: left or right hemisphere dominance? Preliminary findings in a hospital-based population. *Seizure* 2001; **10**: 570–572.
4. Kaplan, P. and Ming, X. Epileptic foci are not more frequently found in the left hemisphere despite clinical presentation with suspected seizures. *Journal of Clinical Neurophysiology* 1997; **14**: 451.
5. Beaumanoir, A., Ballis, T., Varfia, G. and Ansari, K. Benign epilepsy of childhood with rolandic spikes. *Epilepsia* 1974; **15**: 301–315.
6. Heijbel, J., Blom, S. and Bergfors, P. Benign epilepsy of children with centrotemporal EEG foci. A study of incidence rate in outpatient care. *Epilepsia* 1975; **16**: 657–664.
7. Lerman, P. and Kivity, S. Benign focal epilepsy of childhood. *Arch Neurol* 1975; **32**: 261–264.
8. Cavazzutti, G. Epidemiology of different types of epilepsy in school age children of Modena, Italy. *Epilepsia* 1980; **21**: 57–62.
9. Gregory, D. and Wong, P. Topographical analysis of the centrotemporal discharges in benign rolandic epilepsy of childhood. *Epilepsia* 1984; **25**: 705–711.
10. Kabiraj, M., Rajeh, S., Awada, A., Abduljabbar, M., Daif, A., al Taban, A. and al Bunyan, M. Centro-temporal benign epilepsy in Saudi children. *Seizure* 1997; **Apr 6**: 139–144.