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Increased rate of Non-Right Handedness in patients with bipolar disorder

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Non-right handedness is more prevalent in subjects with mental disorders (up to 28%)(^{1,2}) compared to the general population (8%-10%)(³⁻⁶). Data on the association of non-right handedness to bipolar disorder specifically are ambiguous, with data suggesting increased, similar, and decreased rates of non-right-handedness in those with bipolar disorder compared to the general population (7-¹³). Putative differences in handedness could yield insights into lateralized cerebral organization or dysfunction as a contributor to pathology in bipolar disorders. We assessed the rate and clinical correlates of non-right handedness in a large cohort of patients with bipolar disorder enrolled in the Systematic Treatment Enhancement Program for Bipolar Disorders (STEP-BD).

Method

Detailed methods and procedures for this large national study are described elsewhere (14). At entry into STEP-BD, subjects completed the 10-item Edinburgh Handedness Inventory (Oldfield scale)(¹⁵), which rates hand preference for 10 tasks, yielding a Laterality Quotient, with zero or negative scores indicating non-right-handedness, and positive scores indicating right-handedness, and positive scores indicating right-handedness. Mood state and medication status at the time of handedness evaluation were not standardized.

From the first 1000 patients enrolled, 796 were diagnosed with bipolar disorder type I or II and had complete handedness data. We determined non-right handedness rate and relationships to demographic and clinical variables as described below.

Results

The mean $\pm$ SD age of patients at the time of the evaluation and STEP-BD enrollment was 41.18 $\pm$ 12.64 years. The majority of patients were female (59.6%), white (92.8%), and not married (62.5%) and had bipolar disorder type I (74.4%). Fifteen percent of bipolar patients were non-right-handed. No significant relationships were found between handedness and any of the assessed demographic (gender, race) or clinical (subtype of bipolar disorder, age at onset and family history of bipolar disorder, history of psychosis, suicide attempt, alcohol and substance abuse, attention-deficit/hyperactivity disorder, and generalized anxiety disorder) parameters. For example, the rates of non-right-handedness were only nonsignificantly higher in bipolar I disorder patients (15.4%) compared to bipolar II disorder patients (13.7%), in male (16.2%) compared to female (14.2%) patients, and in patients with (17.8%) compared to without

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(13.9%) a first-degree family history of bipolar disorder. In addition, the age at onset of mood elevation in non-right-handed compared to right-handed bipolar patients was only nonsignificantly lower (20.7 vs. 22.2 years), and age at onset of depression was only nonsignificantly higher in non-right-handed compared to right-handed (19.2 vs. 18.5 years) patients.

In the largest study to date assessing relationships between non-right-handedness and bipolar disorder, we found a 15% rate of non-right-handedness in bipolar disorder, which is about 50% greater than that commonly seen in the general population (3⁻⁶). However, this increased rate of non-right-handedness in bipolar disorder had no significant correlations with demographic or clinical parameters. Admittedly, some assessments of relationships to clinical parameters of interest (e.g., current mood state, medication status, cognitive performance) were not performed. Nevertheless, interest in the role of lateralization in the neuropathology of bipolar disorder continues to be fueled and supported by reports indicating that asymmetry abnormalities in perception, cerebral distribution of monoamines, and cerebral activation are mood state dependent and are modulated by treatment. Further investigations are need to assess whether non-right-handedness correlates with biological or functional hemispheric asymmetry parameters in patients with bipolar disorder.

References

1. Klar AJS. Genetic models for handedness, brain lateralization, schizophrenia, and manic-depression. *Schizophr Res* 1999;39:207–218. [PubMed: 10507513]
2. Coren S, Porac C. Fifty centuries of right-handedness: the historical record. *Science* 1977;198:631–632. [PubMed: 335510]
3. Annett, M. *Left, Right, Hand and Brain: The Right Shift Theory*. London, Hillsdale, New Jersey: Lawrence Erlbaum Associates; 1985.
4. Springer, SP.; Deutsch, G. *Left Brain Right Brain*. New York: W. H. Freeman and Company; 1997.
5. Annett M. A Classification of Hand Preference by Association Analysis. *Br J Psychiatry* 1970;61(3): 303–321.
6. Lansky LM, Feinstein H, Peterson JM. Demography of handedness in two samples of randomly selected adults (N=2083). *Neuropsychologia* 1988;26(3):465–477. [PubMed: 3374805]
7. Sackeim, HA.; Decina, P. Lateralized Neuropsychological Abnormalities in Bipolar Adults and in Children of Bipolar Proband. In: Flor-Henry, P.; Gruzelier, J., editors. *Laterality and Psychopathology*. Elsevier Science Publishers; Amsterdam, New York, Oxford: 1983. p. 103-128.
8. Clementz BA, Iacono WG, Beiser M. Handedness in First-Episode Psychotic Patients and Their First-Degree Biological Relatives. *J Abnorm Psychol* 1994;103(2):400–403. [PubMed: 8040511]
9. Nasrallah HA, McCalley-Whitters M. Motor Lateralization in Manic Males. *Br J Psychiatry* 1982;140:521–522. [PubMed: 7104536]
10. Flor-Henry, P. Laterality, Shifts of Cerebral Dominance, Sinistrality and Psychosis. In: John, G.; Pierre, FH., editors. *Hemisphere Asymmetries of Function in Psychopathology*. Elsevier/North-Holland Biomedical Press; Amsterdam, New York, Oxford: 1979. p. 3-19.
11. Kathmann N, Hochrein A, Uwer R, et al. Deficits in Gain of Smooth Pursuit Eye Movements in Schizophrenia and Affective Disorder Patients and Their Unaffected Relatives. *Am J Psychiatry* 2003;160(4):696–702. [PubMed: 12668358]
12. Taylor MA, Amir N. Sinister Psychotics. Left-Handedness in Schizophrenia and Affective Disorder. *J Nerv Ment Dis* 1995;183:3–9. [PubMed: 7807066]
13. Fleming JJ, Dalton R, Standage KF. Handedness in Psychiatric Patients. *Br J Psychiatry* 1977;131:448–452. [PubMed: 588863]
14. Sachs GS, Thase ME, Otto MW, et al. Rationale, Design, and Methods of the Systematic Treatment Enhancement Program for Bipolar Disorder (STEP-BD). *Biol Psychiatry* 2003;53:1028–1042. [PubMed: 12788248]

15. Oldfield RC. The Assessment and Analysis of Handedness: The Edinburgh Inventory. *Neuropsychologia* 1971;9:97–113. [PubMed: 5146491]