

A « sticky » interhemispheric switch in bipolar disorder ?

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Despite years of research into bipolar disorder (manic depression), its underlying pathophysiology remains elusive. It is widely acknowledged that the disorder is strongly heritable, but the genetics are

complex with less than full concordance in monozygotic twins and at least four susceptibility loci identified. We propose that bipolar disorder is the result of a genetic propensity for slow interhemispheric

switching mechanisms that become « stuck » in one or the other state. Because slow switches are also « sticky »

when compared with fast switches, the clinical manifestations of bipolar disorder may be explained by

hemispheric activation being « stuck » on the left (mania) or on the right (depression). Support for this

« sticky » interhemispheric switching hypothesis stems from our recent observation that the rate of perceptual alternation in binocular rivalry is slow in euthymic subjects with bipolar disorder ($n=18$, median=0.27Hz) compared with normal controls ($n=49$, median=0.60Hz, $p<0.0005$). We have presented evidence elsewhere that binocular rivalry is itself an interhemispheric switching phenomenon.

The rivalry alternation rate (putative interhemispheric switch rate) is robust in a given individual, with a

test-retest correlation of more than 0.8, making it suitable for genetic studies. The interhemispheric switch rate may provide a trait-dependent biological marker for bipolar disorder.

Keywords : interhemispheric switching ; bipolar disorder ; binocular rivalry ; mood ; genetics