Objective smartphone data as a potential diagnostic marker of bipolar disorder

Currently, the diagnosis in bipolar disorder relies on patient information and careful clinical evaluations and judgements with a lack of objective tests. Core clinical features of bipolar disorder include changes in behaviour. We aimed to investigate objective smartphone data reflecting behavioural activities to classify patients with bipolar disorder compared with healthy individuals. Objective smartphone data were automatically collected from 29 patients with bipolar disorder and 37 healthy individuals. Repeated measurements of objective smartphone data were performed during different affective states in patients with bipolar disorder over 12 weeks and compared with healthy individuals. Overall, the sensitivity of objective smartphone data in patients with bipolar disorder versus healthy individuals was 0.92, specificity 0.39, positive predictive value 0.88 and negative predictive value 0.52. In euthymic patients versus healthy individuals, the sensitivity was 0.90, specificity 0.56, positive predictive value 0.85 and negative predictive value 0.67. In mixed models, automatically generated objective smartphone data (the number of text messages/day, the duration of phone calls/day) were increased in patients with bipolar disorder (during euthymia, depressive and manic or mixed states, and overall) compared with healthy individuals. The amount of time the smartphone screen was 'on' per day was decreased in patients with bipolar disorder (during euthymia, depressive state and overall) compared with healthy individuals. Objective smartphone data may represent a potential diagnostic behavioural marker in bipolar disorder and may be a candidate supplementary method to the diagnostic process in the future. Further studies including larger samples, first-degree relatives and patients with other psychiatric disorders are needed.

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