Combined Measures of Psychomotor and Cognitive Alterations as a Potential Hallmark for Bipolar Depression

Alison Robin[1,2], Anne Sauvaget[1,2], Thibault Deschamps[1],
Samuel Bulteau[2], and Véronique Thomas-Ollivier[1] ✉

[1]Laboratory "Movement, Interactions, Performance" (E.A. 4334), Faculty of Sport Sciences, University of Nantes, Nantes, France
[2]Addictology and Liaison Psychiatry Department, University Hospital Nantes, Nantes, France

Objective The current study aimed to examine whether specific features of psychomotor retardation (PMR) and cognitive functioning established different profiles in unipolar (UD) and bipolar depression (BD).

Methods Two groups of age-matched patients with UD (n=54) and BD (n=20) completed the Montgomery-Asberg Depression Rating Scale (MADRS/60), the Montreal Cognitive Assessment (MoCA/30), and the Salpêtrière Retardation Rating Scale (SRRS/60). We analyzed the group effect and then performed intra-group analyses.

Results The BD patients have higher SRRS score, and lower MoCA score than UD despite no difference on the level of depression between UD and BD. Our results show that PMR can be predicted by the level of depression in UD and by the cognitive alteration and onset of disease in BD.

Conclusion PMR is a relevant marker of depression. Our results highlight the importance of concomitant evaluation of psychomotor and cognitive functions in the distinction of UD and BD symptoms. **Psychiatry Investig 2019;16(12):954-957**

Key Words Psychomotor retardation, Unipolar depression, Bipolar depression, Cognitive functions.

INTRODUCTION

Psychomotor retardation (PMR) is described as a central symptom in depression.[1] PMR has a negative impact on quality of life in both social and professional functioning.[2] Moreover, it appears to be a solid indicator of the transition to chronicity.[3] Its assessment in clinical settings is of crucial importance for the patient's quality of life. Psychomotor disturbance is characterized by impairments in motor, cognitive and verbal functioning[4] expressed through agitation or retardation symptoms in bipolar (BD) and unipolar depressions (UD). Distinguishing unipolar from bipolar patients is a major clinical issue. Indeed, the lack of relevant markers of BD leads to misdiagnosis of the illness. When a bipolar patient is assessed in a depressive phase, on the absence of manic or hypomanic previous episodes, there is a relative risk of more than 40% of being mistakenly diagnosed as unipolar depression.[5] Indeed, the diagnostic criteria for depressive episodes defined the American Psychiatric Association[6] does not discriminate unipolar and bipolar disorders. In order to propose clinical leads to help the distinction between UD and BD, our study focuses on Salpêtrière Retardation Rating Scale[7] (SRRS) which allows to explore all facets of the retardation component of PMR. This symptom is described in both populations, and sometimes identified as more prone in BD,[8,9] or similar in other studies.[10,11] This study aims to test if PMR in relation with the level of depression and cognition, is a relevant feature in unipolar and bipolar depression.[11,12]

METHODS

Participants

Fifty-four outpatients with UD and 20 patients with BD were recruited in the Addictology and Liaison-Psychiatry department of the University Hospital of Nantes. All of these

patients had a long history of illness. Inclusion criteria were: 1-diagnosis of bipolar disorder or unipolar disorder, according to the DSM-5; 2-age over 18 years old; 3-a score superior or equal to 20 on the Montgomery-Asberg Depression Rating Scale (MADRS);[13] 4-a cognitive score superior or equal to 10 on Montreal Cognitive Assessment (MoCA).[14] Exclusion criteria were: 1-presence of psychotic disorders or addiction; 2-presence of neurodegenerative disorders. All participants provided informed consent for the study.

Evaluation criteria: SRRS, is a 15 items scale (/60) that encompass the clinical diversity of this symptom by measuring motor, ideational and verbal behavior. The presence of a PMR is notified with a score ≥20.[15] MoCA is a brief test (/30) covering most cognitive domains that may be impaired in subjects with mild or severe cognitive impairment irrespective of etiology. Neurocognitive impairment is excluded beyond 26/30.

Data analysis

Due to the skewed distribution of several continuous variables, to the test the effects of group (UD vs. BD) on age, MADRS, MoCA, SRRS and age of onset, the Mann-Whitney sum rank test were carried out (Table 1).

To explore the relationship between aforesaid dependent variables in UD and BD, simple correlation was used as a first step and was completed by multilinear regression analysis to explain the relationship between SRRS as dependent variable and age, MoCA, MADRS and age of onset as predictors.

Additionally, UD and BD retardation sub-groups (SRRS score ≥20) were compared on each item of the SRRS using the Mann-Whitney sum rank test.

RESULTS

Our results revealed that BD patients have higher psychomotor retardation (SRRS; $p=0.042$), and lower cognitive score (MoCA; $p=0.029$) than UD.

In addition, in the UD group, the correlation analysis revealed a link between SRRS and MADRS ($r=0.69$, $p<0.001$), a correlation between MoCA, Age and Onset the disease (MoCA/age: $r=-0.39$, $p=0.01$; MoCA/onset of the disease: $r=-0.45$, $p<0.01$; age/onset of the disease: $r=0.37$, $p<0.01$). In the BD, a significant correlation appears between SRRS and MoCA ($r=-0.65$, $p<0.01$), age of onset and MADRS ($r=0.51$, $p<0.05$); age of onset and SRRS ($r=0.66$, $p<0.01$), and age and MADRS ($r=0.45$, $p<0.05$).

The multilinear regression analysis in UD (MoCA, MADRS, age and onset of disease as predictor of SRRS) [$F_{(4,49)}=10.26$, $p<0.01$, $R^2=0.49$] showed that MADRS significantly predicted SRRS ($p<0.001$, $\beta=0.71$). The same analysis was performed in BD group and MADRS, age and onset of the disease as predictor to SRRS [$F_{(4.15)}=10.05$, $p<0.01$, $R^2=0.74$]. These results

Table 1. Baseline characteristics and group effects (Mann-Whitney sum rank test) in UD and BD

	UD (N=54)	BD (N=20)	p-value
Female gender, N (%)	37 (68.5)	10 (50)	
Age (years), mean±SD	53.5±11.9	57.2±12.8	0.228
MADRS score (/60), mean±SD	28.5±5.4	30.7±5.9	0.145
SRRS score (/60), mean±SD	22.51±9.18	28.40±9.73	0.042*
MoCA score (/30), mean±SD	26.21±2.87	23.68±4.84	0.029*
Age of onset	36.76±14.91	33.20±17.41	0.342
Treatments (%)			
Monoamine oxidase inhibitors	0	0	
Tricyclic antidepressants	28.57	0	
Selective serotonin reuptake	0	0	
Inhibitors			
Serotonin-norepinephrine			
Reuptake inhibitors	39.29	33.33	
Other antidepressants	35.71	16.67	
Mood stabilizers	14.29	50	
Benzodiazepines	67.86	83.33	
Antipsychotics	42.86	66.67	

*p<0.05. MADRS: Montgomery-Asberg Depression Rating Scale, SRRS: Salpêtrière Retardation Rating Scale, MoCA: Montreal Cognitive Assessment, UD: unipolar depression, BD: Bipolar depression

show MoCA (β=-0.55; p<0.01) and Onset of the disease (β=0.61, p<0.01) significantly predicted SRRS.

Finally, the retardation subgroups were compared using the Mann-Whitney sum rank test for all the SRRS items. No difference between subgroups was found whatever the item (all p values>0.05).

DISCUSSION

The main outcome of this study is the presence of more severe psychomotor and cognitive impairment in bipolar depression. The other variables measured (age, severity of depression, and age of onset) do not differ in UD (n=54) and BD (n=20) patients (Table 1). These results are in accordance with studies focusing on the level of daily physical activity, the gross movement dexterity,[9] the verbal fluency performance[16] as well as cognitive skills associated with PMR such as attention, and executive functions.[17]

The higher percentage of bipolar patients with PMR in our study (score>20; BD: 85%; UD: 59.3%), and classically observed in the literature, could explain, in part, the group effect on the SRRS. In the UD, the multivariate regression model reveals that the SRRS performance can be predicted by the level of depression. This result highlights the close link between depressive and psychomotor symptoms in unipolar depression and support the diagnostic value of PMR. In BD, the analysis reveals a correlation between SRRS and MoCA. This was confirmed by multivariate regression model, SRRS score can be predicted by the MoCA and age of onset. These results suggest a singular link between cognition and retardation in bipolar depressives' patients and are in accordance with the literature showing impairments in processing speed,[18] executive functions[19] or visual attention[20] in this population. Different explanations are provided in the literature such as the effect of the family history, the earlier onset of disorder, the number of manic episodes or the substance abuse,[21] which could involve greater cognitive scars in bipolar patients.

In our naturalistic study, the onset of disease doesn't differ between groups and substance abuse during the protocol is an exclusion criteria. This doesn't exclude the possibility of previous abuses. Indeed, it has been shown that BD patients are more prone to substance abuse in their history of illness.[22]

Neurobiological studies have also shown differences between unipolar and bipolar patients,[23,24] such as a greater reduction of grey matter volume in the inferior frontal gyrus, precentral gyrus[25] and cerebellum[26,27] which could imply that PMR is expressed differently depending on the type of depression. The PMR can sometimes manifest itself either through more important cognitive retardation or through more significant motor retardation;[28,29] but both cognitive and motor retardation are, in some measure, always present.[30] We show the importance to evaluate PMR and cognitive functions together in clinical practice to get more diagnostic leads.

We acknowledge some limitations in our study. First, bipolar and unipolar patients did not have the same treatment, which could have an impact on the expression of the psychomotor retardation.[31-34] Furthermore, some patients with unipolar depression may be re-diagnosed as bipolar in the future; a follow-up would have been very helpful for accurate diagnosis.

Our study shows that the PMR is a potential tool for discrimination between the two populations. Its characterization is a crucial challenge to better understand the underlying neurobiological mechanisms and to improve diagnosis. Further research with larger samples and more targeted evaluations are needed. Indeed, clinicians often use hetero-evaluation scales which lack sensitivity to optimize PMR evaluation for diagnosis. We are currently working on the implementation of a test combining psychomotor and cognitive assessments. The challenge is to choose the most appropriate combination for the co-evaluation of symptoms.

Conflicts of Interest

The authors have no potential conflicts of interest to disclose.

Author Contributions

Conceptualization: Véronique Thomas-Ollivier, Alison Robin. Data curation: Alison Robin. Formal analysis: Thibault Deschamps. Funding acquisition: Thibault Deschamps. Investigation: Alison Robin. Methodology: Anne Sauvaget. Project administration: Véronique Thomas-Ollivier. Supervision: Véronique Thomas-Ollivier. Validation: All co-authors. Visualization: Samuel Bulteau. Writing—original draft: Alison Robin, Véronique Thomas-Ollivier. Writing—review & editing: Alison Robin, Véronique Thomas-Ollivier.

ORCID iDs

Véronique Thomas-Ollivier   https://orcid.org/0000-0003-4158-3436
Alison Robin   https://orcid.org/0000-0002-8830-744X

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