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THE IMPACTS OF BIPOLAR AFFECTIVE DISORDER ON EXECUTIVE FUNCTIONS OF THE BRAIN AND NEUROPSYCHOLOGICAL DIFFERENTIAL DIAGNOSIS

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ABSTRACT: Bipolar Affective Disorder (BAD) is a chronic and recurrent mood disorder characterized by episodes of depression and mania/hypomania, often accompanied by cognitive impairments. Among these, changes in executive functions stand out, which can impact the individual's overall functioning. **Objective:** To analyze the impacts of Bipolar Affective Disorder on brain executive functions and the contributions of neuropsychological differential diagnosis. **Methodology:** This is a bibliographic and exploratory study based on books, monographs, dissertations, theses, and scientific articles available in databases such as SciELO, PePSIC, BVS, CAPES Journals, PubMed, Scopus, and Web of Science, prioritizing publications between 2015 and 2025. Studies prior to this period were also included when they presented relevant content on the impacts of TAB on executive functions and neuropsychological differential diagnosis. **Results:** The literature indicates that TAB is associated with significant impairments in executive functions, such as planning, decision-making, impulse control, cognitive flexibility, and working memory. These deficits, often related to changes in frontal regions, have negative repercussions in areas such as occupational performance, interpersonal relationships, and quality of life. It is also evident that psychiatric comorbidities and the clinical course of the disorder can aggravate cognitive impairment. **Conclusion:** It is concluded that BAD, through its impacts on executive functions, causes significant impairments in different dimensions of an individual's life. Differential diagnosis supported by neuropsychological assessment contributes to greater accuracy and speed in identifying the disorder, enabling more appropriate and potentially preventive interventions in relation to functional and psychosocial damage.

KEYWORDS: Bipolar Affective Disorder; Brain Executive Functions; Neuropsychological Differential Diagnosis.

INTRODUCTION

Bipolar Affective Disorder (BAD) is a chronic and recurrent mood disorder characterized by episodes of mania/hypomania and depression, with a significant impact on the daily lives of affected individuals (APA, 2014; LIMA et al., 2005). From a nosological point of view, the main classification systems, such as the Diagnostic and Statistical Manual of Mental Disorders – DSM-5 – and the International Classification of Diseases – ICD-10 – describe BAD as a condition marked by significant fluctuations in mood and activity level, associated with functional impairments in different domains (APA, 2014; WHO, 1993).

In addition to affective symptoms, BPD has been increasingly associated with persistent cognitive changes, even in phases of euthymia. Studies indicate that executive functions such as planning, organization, cognitive flexibility, working memory, and inhibitory control may be compromised in individuals with BPD, which directly affects occupational, academic, and social performance and quality of life (ROCCA; LAFER, 2006; LEWIS et al., 2012; MARTÍNEZ-ARÁN et al., 2004). Executive functions, in turn, are cognitive processes central to self-control, decision-making, and adaptation to the environment, and are closely related to the integrity of the prefrontal cortex (BARKLEY, 2012; ZELAZO; MULLER, 2002).

Recent meta-analyses and reviews reinforce that deficits in executive functions and memory can be observed in different subtypes of ODD as well as in remission phases, suggesting a relatively stable pattern of impairment with important implications for prognosis (BORA; YÜCEL; PANTELIS, 2009; COTRENA et al., 2020; SZMULEWICZ et al., 2015). These findings highlight the need to understand BPD not only as a mood disorder but as a condition involving complex neurocognitive dysfunctions.

From a clinical point of view, the differential diagnosis of BPD is a significant challenge, since the symptoms can overlap with other mood disorders, personality disorders, anxiety disorders, and substance use (ROSENFELD, 2016; CUNHA; LIMA, 2018). The presence of comorbidities and mixed episodes can delay proper diagnosis, increasing the risk of inaccurate interventions and more serious psychosocial damage over time (SANCHES; ASSUNÇÃO; HETEM, 2005; BOCK et al., 2022).

In this context, neuropsychological assessment plays a central role as an auxiliary resource in differential diagnosis, as it allows the identification and description of performance patterns in executive functions and other cognitive domains that may be altered in individuals with TAB. The integration of clinical, neuropsychological, and functional data contributes to greater diagnostic accuracy, better therapeutic planning, and more targeted interventions, both at the individual level and in terms of public health (BOCK et al., 2022; MACHADO-VIEIRA; SANTIN; SOARES, 2004).

Given the above, this study is justified by the need to deepen the understanding of the impacts of Bipolar Affective Disorder on brain executive functions and the role of neuropsychological differential diagnosis in clinical practice. Thus, this article aims to analyze the impacts of Bipolar Affective Disorder on brain executive functions and discuss the contributions of neuropsychological differential diagnosis to the identification and management of this disorder.

METHODOLOGY

This study adopted a bibliographic research approach, qualitative in nature and exploratory in character. According to Gil (2017), bibliographic research is based on previously published material, allowing for the analysis and discussion of a problem based on theoretical contributions accumulated by various authors. In this sense, we sought to gather and systematize scientific productions that addressed Bipolar Affective Disorder, its repercussions on brain executive functions, and the role of neuropsychological differential diagnosis.

Books, monographs, dissertations, theses, and scientific articles available in national and international databases, such as Scientific Electronic Library Online (SciELO), Virtual Health Library (BVS), Electronic Journals in Psychology (PePSIC), CAPES Journals, PubMed/Medline, Scopus, and Web of Science, were consulted. Initially, priority was given to publications from 2015 to 2025, considering the current discussions on the topic. However, works prior to this time frame were also included when they presented content relevant to understanding the impacts of TAB on executive functions and neuropsychological differential diagnosis.

The search strategy used the following keywords in Portuguese: "Transtorno Afetivo Bipolar" (Bipolar Affective Disorder),

"Funções Executivas Cerebrais" (Brain Executive Functions), and "Diagnóstico Diferencial Neuropsicológico" (Neuropsychological Differential Diagnosis), either alone or in combination, according to the study objective. When necessary, equivalent terms in English were used to access international publications related to the topic. Studies that directly addressed BAD and its relationship with executive functions, cognition, and neuropsychological assessment were included, as well as those that discussed the differential diagnosis between BAD and other psychiatric disorders.

Materials that did not fit the proposed theme, studies repeated between databases, texts without access to the full content, and publications that addressed BAD tangentially, without relation to executive functions or differential diagnosis, were excluded. After selection, the works were read in full and organized in order to support the construction of the theoretical framework, the analysis of the results, and the critical discussion of the impacts of Bipolar Affective Disorder on brain executive functions and the neuropsychological differential diagnosis process.

THEORETICAL FRAMEWORK

Bipolar Affective Disorder: concept and classification

Bipolar Affective Disorder (BAD) is a cyclical, chronic, and recurrent mood disorder characterized by alternating episodes of mania/hypomania and depression, with significant functional repercussions on the individual's life. From a diagnostic point of view, the main classification systems used in clinical practice are the International Statistical Classification of Diseases and Related Health Problems (ICD-10) and the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) (APA, 2014; WHO, 1993).

In DSM-5, BPD is described mainly in two subtypes: Bipolar Disorder Type I, characterized by the occurrence of one or more manic episodes, which may be preceded or followed by hypomanic or major depressive episodes; and Bipolar Disorder Type II, defined by a clinical course with recurrent major depressive episodes and at least one hypomanic episode, with no history of manic episodes. In both cases, mood and energy swings tend to cause significant impairment in social, occupational, and family domains (LIMA et al., 2005).

Symptoms, comorbidities, and clinical diagnosis

The depressive picture associated with BPD includes symptoms such as depressed mood, anhedonia, changes in appetite and sleep, fatigue, feelings of guilt or worthlessness almost every day, difficulty concentrating, and suicidal ideation. Episodes of mania, on the other hand, are characterized by abnormally and persistently elevated, expansive, or irritable mood, associated with increased energy and activity, which may include reduced need for sleep, racing thoughts, increased talkativeness, impulsivity, and involvement in risky behaviors (APA, 2014).

The ICD-10 describes bipolar affective disorder as the presence of two or more episodes in which mood and activity level are markedly altered, sometimes toward euphoria and hyperactivity, sometimes toward sadness and psychomotor inhibition, with a significant impact on overall functioning (WHO, 1993).

Psychiatric comorbidities are common in individuals with BPD and contribute to making diagnosis difficult. Studies indicate that substance use disorders, anxiety disorders, eating disorders, and personality disorders are common, often associated with a more severe clinical course, greater risk of relapse, and greater use of health services (SANCHES; ASSUNÇÃO; HETEM, 2005). As a result, there is often a significant delay between the onset of symptoms and the establishment of an appropriate diagnosis, which aggravates psychosocial damage throughout life.

Treatment of Bipolar Affective Disorder

The treatment of BPD usually involves a combination of pharmacotherapy, psychotherapeutic interventions, and psychosocial management strategies. The use of mood stabilizers, antipsychotics, and, in some cases, antidepressants, combined with regular clinical follow-up, is a central axis of care, but it is not always sufficient to control all symptoms and prevent relapses (MACHADO-VIEIRA; SANTIN; SOARES, 2004).

In this context, psychotherapeutic interventions, especially cognitive and psychoeducational approaches, have proven to be important allies. Cognitive-behavioral therapy (CBT) has been widely used in the management of BPD because it focuses on the relationship between thoughts, emotions, and behaviors, promoting the development of coping strategies, adherence to treatment, and relapse prevention (KNAPP; ISOLAN, 2005). Studies indicate that combining medication with structured CBT programs can reduce the frequency and intensity of mood episodes, improve psychosocial functioning, and contribute to greater clinical stability (LAM et al., 2005; COSTA et al., 2011).

In addition, family and social support, psychoeducation of the patient and their family members, and multidisciplinary follow-up are essential for dealing with the chronic nature of the disorder, promoting self-care strategies and early identification of signs of relapse (MACHADO-VIEIRA; SANTIN; SOARES, 2004; KNAPP; ISOLAN, 2005).

Brain executive functions

Executive functions are a set of cognitive processes that allow individuals to plan, organize, monitor, and adapt their behavior to achieve goals, regulating thoughts, emotions, and actions. They include skills such as planning, organization, working memory, inhibition of automatic responses, attentional control, and cognitive flexibility. These functions are strongly associated with the functioning of the prefrontal cortex and its connections to other brain regions (BARKLEY, 2012).

From a developmental perspective, executive functions are fundamental to academic performance, problem solving, adaptation to new demands, and emotional regulation. Cognitive flexibility, for example, allows individuals to change strategies in the face of new information or environmental demands, adapting their behavior to social norms and contextual expectations (ZELAZO; MULLER, 2002). Changes in these skills can lead to difficulties in organizing routines, making decisions, controlling impulses, and maintaining stable interpersonal relationships.

Impacts of Bipolar Affective Disorder on executive functions

Several studies have pointed out that BPD is associated with significant impairments in different aspects of executive functions. Patients with BPD may experience difficulties in working memory, planning, cognitive flexibility, response inhibition, and decision-making, even during periods of symptomatic remission (LEWIS et al., 2012; MARTÍNEZ-ARÁN et al., 2004). These deficits are related to changes in fronto-striatal circuits and prefrontal areas, often identified in neuropsychological and neurofunctional studies (ROCCA; LAFER, 2006; ROBBINS, 2016).

The repercussions of these executive impairments can manifest themselves in different contexts of an individual's life, affecting professional performance, financial stability, organization of daily activities, and quality of interpersonal relationships. Recent meta-analyses indicate that such deficits may be present in both type I and type II TAB patients and their first-degree relatives, suggesting the existence of possible cognitive endophenotypes associated with the disorder (BORA; YÜCEL; PANTELIS, 2009; COTRENA et al., 2020; SZMULEWICZ et al., 2015).

These findings reinforce the need to understand OCD as a condition in which affective symptoms and cognitive dysfunctions are intertwined, influencing the course of the disease, response to treatment, and overall functioning.

Neuropsychological differential diagnosis

The differential diagnosis of TAB requires distinguishing this disorder from other psychiatric conditions that may present similar symptoms, such as major depressive disorder, borderline personality disorder, psychotic conditions, and substance use disorders (ROSENFELD, 2016). Careful assessment of clinical history, mood patterns over time, the presence of manic or hypomanic episodes, and comorbidities is essential for diagnosis.

From this perspective, neuropsychological assessment emerges as an important complementary tool in the differential diagnosis process. Through specific tests, it is possible to investigate the functioning of different cognitive domains, with an emphasis on executive functions, memory, attention, and processing speed. According to Bock et al. (2022), identifying neuropsychological deficits in individuals with BPD can help understand the functional impact of the disorder, support the planning of therapeutic and rehabilitativ tions, and contribute to differentiating the condition from other conditions with overlapping clinical manifestations.

The integration of clinical, neuropsychological, and contextual data thus allows for a broader view of the patient, favoring a more accurate diagnosis and therapeutic interventions that are better tailored to the needs of each individual (CUNHA; LIMA, 2018; BOCK et al., 2022).

RESULTS AND DISCUSSION

Based on the analysis of the selected literature, it is observed that Bipolar Affective Disorder is consistently associated with impairments in different components of executive functions, even in phases of relative clinical stability. Studies indicate that skills such as planning, decision-making, inhibitory control, cognitive flexibility, and working memory are often compromised

in individuals with BAD, significantly affecting overall functioning (LEWIS et al., 2012; MARTÍNEZ-ARÁN et al., 2004; ROCCA; LAFER, 2006).

These deficits have been linked to changes in fronto-striatal circuits and prefrontal regions, areas traditionally involved in behavior regulation and executive process coordination (ROBBINS, 2016). Recent meta-analyses indicate that such impairments can be observed in different subtypes of OCD, as well as in phases of symptomatic remission, suggesting a relatively stable pattern of impairment throughout the course of the disease (BORA; YÜCEL; PANTELIS, 2009; COTRENA et al., 2020; SZMULEWICZ et al., 2015). These findings reinforce the understanding of BPD as a condition that involves not only mood swings but also neurocognitive dysfunctions with lasting impact.

From a functional point of view, impairments in executive functions can manifest themselves in difficulties in organizing routines, making everyday decisions, managing finances, controlling impulses, and maintaining stable interpersonal relationships. Such difficulties contribute to occupational instability, family conflicts, and impairment of the individual's autonomy, amplifying the psychosocial impact of the disorder (MARTÍNEZ-ARÁN et al., 2004; MACHADO-VIEIRA; SANTIN; SOARES, 2004).

Another important aspect highlighted in the literature refers to psychiatric comorbidities, particularly substance use disorders, anxiety disorders, eating disorders, and personality disorders. These conditions tend to aggravate the clinical course of BPD, increase the risk of relapse, hinder adherence to treatment, and contribute to delays in establishing the correct diagnosis (SANCHES; ASSUNÇÃO; HETEM, 2005; CUNHA; LIMA, 2018). In many cases, the presence of mixed episodes and symptoms that overlap with other mood and personality disorders makes the diagnostic process even more challenging, requiring careful and longitudinal clinical evaluation.

In this scenario, neuropsychological assessment emerges as a fundamental resource in the differential diagnosis process. Using specific instruments, it is possible to identify the functioning profile of executive functions, as well as other cognitive domains, providing relevant information about the impact of the disorder on the patient's daily life (BOCK et al., 2022). The identification of performance patterns compatible with TAB, combined with the analysis of clinical history and life contexts, contributes to differentiating the condition from other conditions with similar symptoms and to planning more appropriate interventions.

The reviewed literature also points out that the combination of clinical psychiatric assessment, psychological assessment, and neuropsychological assessment tends to favor more accurate diagnoses and more targeted interventions. In this sense, dialogue between psychiatry, clinical psychology, and neuropsychology is essential to understand the complexity of TAB and manage not only affective symptoms but also executive dysfunctions and their psychosocial consequences.

Finally, the results of this study reinforce that understanding the impacts of TAB on executive functions and the judicious use of neuropsychological assessment in differential diagnosis contribute to more qualified clinical practice. This translates into greater diagnostic accuracy, better the-

rapeutic planning, and potential reduction of impairments in different areas of the life of individuals with TAB.

CONCLUSION

The present study aimed to analyze the impacts of Bipolar Affective Disorder on brain executive functions and discuss the contributions of differential diagnosis and neuropsychological assessment in identifying this disorder. Based on the literature review, it was found that BAD is associated with significant impairments in different components of executive functions, such as planning, working memory, cognitive flexibility, inhibitory control, and decision-making. These deficits may be present even in phases of euthymia, indicating cognitive impairment that goes beyond acute episodes of mood swings (MARTÍNEZ-ARÁN et al., 2004; LEWIS et al., 2012; BORA; YÜCEL; PANTELIS, 2009).

It has also been found that such executive dysfunctions directly affect the daily lives of individuals with BPD, causing harm in family, social, academic, and professional contexts, as well as contributing to difficulties in adhering to treatment and organizing self-care routines. The presence of psychiatric comorbidities, such as anxiety disorders, substance use, and personality disorders, aggravates this scenario, making the clinical course more complex and increasing the risk of delay in establishing the appropriate diagnosis (SANCHES; ASSUNÇÃO; HETEM, 2005; CUNHA; LIMA, 2018).

In this context, neuropsychological assessment proves to be an important tool for differential diagnosis, as it allows the identification of cognitive performance patterns compatible with TAB and differentiation from other disorders with similar symptoms (BOCK et al., 2022). The integration of neuropsychological data with clinical psychiatric and psychological assessment enables a more comprehensive understanding of the patient, favoring personalized interventions that consider both affective symptoms and executive dysfunctions and their functional implications.

It can therefore be concluded that understanding the impacts of Bipolar Affective Disorder on brain executive functions and incorporating neuropsychological differential diagnosis into clinical practice can contribute to greater diagnostic accuracy, more effective interventions, and a potential reduction in psychosocial impairments throughout the course of the disease. These findings highlight the importance of strengthening the dialogue between psychiatry, psychology, and neuropsychology, as well as encouraging new research that deepens the relationship between BAD, executive functions, and functional outcomes, including in different cultural and health service contexts.

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