

Validation of the National Institute of Neurological Disorders and Stroke Criteria for Psychosis in Parkinson Disease

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Objectives: *Parkinson disease (PD) psychosis is a condition associated with several negative outcomes. Despite its impact, there is a lack of validated diagnostic tools for this condition. In this study, we aim to verify the validity of the proposed NINDS criteria for PD psychosis and explore its possible applications in clinical practice. Design, Settings, Participants:* We prospectively selected 104 subjects with idiopathic PD referred to a movement disorder clinic for a cross-sectional evaluation. **Measurements:** A neurological evaluation confirmed idiopathic PD and classified PD psychosis according to the NINDS criteria. A psychiatrist then classified the subject according to DSM-IV-TR criteria for psychosis, considered the reference standard. We used Cohen's kappa (κ) to quantify reliability between methods. Finally, we designed models assigning a weighted score to each characteristic psychotic symptom from the NINDS criteria (criterion A), and plotted receiver operating curves for each model. **Results:** Of the total sample, 52 (50%) met proposed criteria for NINDS PD psychosis and 16 (15.6%) met reference standard criteria. Inter-rater reliability showed only a fair agreement ($\kappa = 0.30$). By using a scoring approach for each NINDS criteria item and a cutoff total score for the diagnosis of PD psychosis, we significantly increased the agreement for diagnosis reliability ($\kappa = 0.72$), with sensitivity of 94% and specificity of 91%. **Conclusions:** Although the NINDS criteria had limited reliability for diagnosing PD psychosis, a scoring approach for symptoms showed good reliability, with sensitivity and specificity above 90%. This scoring approach may be an accurate tool for identifying patients with PD psychosis. (Am J Geriatr Psychiatry 2017; 25:73-80)

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Psychiatric complications such as depression, apathy, psychosis, and impulse control disorders are

considered prevalent among patients with Parkinson disease (PD), and account for significant impairment

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in quality of life and caregiver burden.^{1,2} The development of criteria and instruments for the detection of mental health syndromes secondary to PD are invaluable for clinicians to accurately identify individuals with these conditions, and to provide timely and efficient treatment aimed to alleviate their symptoms. Several validated clinical scales for depression, anxiety, and apathy in PD are already available.³ There is a gap, however, in diagnostic instruments for psychotic syndromes in PD and the criteria for PD psychosis are still under debate.

The lack of a validated set of criteria for PD psychosis poses a significant obstacle to understanding the syndrome. For instance, although there is general agreement that PD patients are at risk for psychosis, there is a wide variation in the reported prevalence of PD psychosis (from 16%–75%) depending on the criteria used.^{4–8}

A work group from the National Institute of Mental Health (National Institute of Neurological Disorders and Stroke, NINDS) proposed a set of criteria for the diagnosis of PD psychosis, the NINDS criteria.⁹ According to this set of criteria, PD psychosis is diagnosed if symptoms occur in patients with a formal PD diagnosis as defined by the UK Brain Banks criteria,¹⁰ and the onset of PD must have preceded the psychotic symptoms, which should have been continuous for at least 1 month. In addition, patients should present with at least one of a group of psychotic symptoms: illusions, false sense of presence, hallucinations, and delusions. The selection of these four symptoms as sufficient for diagnosis derives from findings of several PD epidemiological reports. They were identified as a particular set of perceptual disturbances that are commonly found in subjects with PD and are thus referred to as “characteristic” psychotic symptoms. Such symptoms were especially prevalent among those with longer course of the disease, severe motor and non-motor symptoms, and cognitive impairment.^{5,8,11} Furthermore, previous data suggested that these phenomena were associated with adverse outcomes such as increasing cognitive decline and progression to severe impairment in insight and functionality.^{12,13}

A diagnosis of PD psychosis on the basis that any perceptual disturbance is sufficient to warrant it may be controversial, however, because patients with only minor symptoms may be clustered with those with more severe thought disorder and delusions. Some reports suggested that patients with minor hallucinations did not differ clinically from those who do not experience

any perception disturbance.⁵ Also, other studies indicated that subjects with hallucinations and other perceptual disturbances differed significantly from patients with frank delusions in cognitive and neuropsychological profile, and suggested that these two groups represented two different syndromes.^{14,15} We also proposed in a previous report that subjects who fulfilled NINDS criteria for PD psychosis but not the criteria set out in the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision* (DSM-IV-TR)¹⁶ were no different from patients without any perceptual disturbances concerning mental health symptoms, functionality, or quality of life.¹⁷

Indeed, the authors of the first NINDS work group report explicitly stated that the criteria as conceived might be controversial, and that careful documentation and analysis of symptoms in series of subjects should provide data for further understanding and refining the diagnosis.⁹ Nevertheless, the proposed NINDS criteria contain relevant concepts that could inform and enrich the clinical understanding of PD psychosis. Thus, our aim is to investigate the accuracy and validity of the NINDS criteria for psychosis and explore its possible applications in clinical practice.

METHODS

We conducted a prospective accuracy analysis of the proposed NINDS criteria for PD psychosis using a standardized guideline for reporting diagnosis accuracy (Standards for Reporting of Diagnostic Accuracy).¹⁸ We selected subjects from the Movement Disorders Clinic of the Hospital Santa Marcelina of São Paulo, Brazil. The local research ethics committee approved this study.

Our sample was drawn from the subjects of our previous publication on the impact of psychotic symptoms in PD patients,¹⁷ in which we recruited subjects consecutively referred from September 2012 to December 2014 from various catchment areas. Those receiving the diagnosis of idiopathic PD were then selected for further evaluation.

Subjects were first evaluated by a neurologist specializing in movement disorders to confirm the diagnosis of idiopathic PD, as defined by the UK Parkinson Disease Society Brain Banks clinical diagnostic criteria.¹⁰ Subjects were also evaluated with the Unified Parkinson Disease Rating Scale (UPDRS)¹⁹ and using the NINDS criteria for psychosis in PD.⁹ For this

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