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Original article

Premonitory urges for tics in adult patients with Tourette syndrome

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Abstract

Objective: Patients with Tourette syndrome (TS) often report characteristic sensory experiences, also called premonitory urges (PUs), which precede tic expression and have high diagnostic relevance. This study investigated the usefulness of a scale developed and validated in children and adolescents–the Premonitory Urge for Tics Scale (PUTS, Woods et al., 2005 [13])–for the assessment of PUs in adult patients with TS. Method: Standard statistical methods were applied to test the psychometric properties of the PUTS in 102 adult TS outpatients recruited from two specialist clinics in the United Kingdom. Results: The PUTS showed good acceptability and endorsement rates, with evenly distributed scores and low floor and ceiling effects. Item-total correlations were moderate to strong; PUTS total scores were significantly correlated with quantitative measures of TS severity. The PUTS showed excellent internal consistency reliability (Cronbach's alpha = 0.85) and Spearman's correlations demonstrated satisfactory convergent and discriminant validity. Conclusions: Although originally devised to assess urges to tic in young patients with TS, the PUTS demonstrated good psychometric properties in a large sample of adults recruited at specialist TS clinics. This instrument is therefore recommended for use across the life span as a valid and reliable self-report measure of sensory experiences accompanying tic expression.

Keywords: Tourette syndrome; Tics; Premonitory urges; PUTS; Psychometric properties; Adult

1. Introduction

Tourette syndrome (TS) is a neurodevelopmental disorder characterized by the presence of multiple motor tics and one or more phonic tics lasting for at least one year, with onset before 21 years of age [1]. Tics are defined as sudden, repetitive non-rhythmic movements or vocalizations which tend to follow a waxing and waning course of severity, intensity and frequency [2]. Patients with TS usually present their first symptoms (motor tics such as eye blinking) around the age of six and often develop co-morbid behavioral problems, such as obsessive compulsive disorder (OCD), attention deficit and hyperactivity disorder (ADHD), affective disorders or impulse control disorders [3,4].

Discomforting bodily sensations, known as sensory phenomena or premonitory urges (PUs), are thought to instigate an involuntary urge to tic, followed by a voluntary capitulation which results in the actual tic expression

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[5–9]. Numerous terms have been used in the literature to describe these subjective experiences, including sensory tics, "just-right" perceptions, feelings of incompleteness, energy and pressure [10]. It has been argued that PUs are an essential component of the subjective phenomenology of TS [7] and therefore a better understanding of these experiences could lead to improved treatment strategies for tics. For example, PUs awareness is an important component of habit reversal training and other behavioral therapies for patients with TS [11,12].

A few years ago, Woods et al. [13] developed a brief patient-report instrument to measure PUs, the Premonitory Urge for Tics Scale (PUTS). This useful scale was validated in populations of children and adolescents affected by tic disorders [13,14]. In the present study, we set out to evaluate the PUTS' psychometric properties (acceptability, reliability and validity) in a clinical sample of adults with TS, in order to establish whether this instrument could be recommended for the quantitative assessment of PUs in adults with TS.

2. Methods

2.1. Participants

Participants were recruited from two tertiary referral clinics for patients with TS in the United Kingdom between 2005 and 2007 (London: $n = 22$) and between 2008 and 2012 (Birmingham: $n = 80$). Participants were consecutive adult outpatients with a clinical diagnosis of TS according to the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision (DSM-IV-TR) criteria [1]. Specifically, the mean age at tic onset of our sample was 6.2 years (range 3–14). Exclusion criteria were age below 16 years, uncertain diagnosis, limited comprehension of the English language and presence of learning disabilities. All participants gave full written informed consent. This study was approved by the local Research Ethics Committees.

2.2. Procedure

Following informed consent, clinical and demographic data were collected from each participant's medical records. All clinical assessments were based on the National Hospital Interview Schedule for TS [15], and the treating clinicians completed the Yale Global Tic Severity Score (YGTSS) [16] and Diagnostic Confidence Index (DCI) [17] as tic severity and lifetime cumulative symptomatology ratings, respectively. Finally, all participants completed the following two likert-type self-report measures.

2.2.1. Premonitory Urge for Tics Scale (PUTS) [13]

The PUTS is a self-report instrument specifically designed to measure the current frequency of different types of PUs in patients with tic disorders. Examples are "Right before I do a tic, I feel like my insides are itchy" (Item 1) and "Right before I do a tic, I feel like there is energy in my body that needs to get out" (Item 6). The original version of the PUTS has 10 questions scored 1–4, with higher values representing a greater frequency of PUs (PUTS total score of 10–40).

2.2.2. Motor tic, Obsessions and Compulsions, Vocal tic Evaluation Survey (MOVES) [18]

The MOVES is a self-report measure of overall TS severity across five domains: motor tics, vocal tics, other tic symptoms (complex tics), compulsivity and obsessionality. The first three domains address tic severity, whilst the latter two cover repetitive behaviors and OCD symptoms. Each subscale comprises four questions, with scores of 1–4 where higher scores reflect greater TS severity. Scoring includes subscale totals of 4–16 and a MOVES total score of 20–80.

2.3. Statistical analyses

Data were anonymized and stored on an electronic database (Microsoft Access 2007). Statistical analyses were performed using the Statistical Package for the Social Sciences for Windows (SPSS Inc., Chicago, IL, USA, v19.0). All the statistical tests were two-sided and used a 0.05 alpha level.

Whenever incomplete PUTS or MOVES data were available (<5% of the total sample), individual mean imputation [19] was carried out and missing data were substituted with the mean value of the individuals' responses on the given questionnaire. The Kolmogorov–Smirnov test was used to assess the normality of the raw continuous data.

Spearman's rank correlations were used to investigate correlations between PUTS item and total scores and other continuous variables, including MOVES subscale and total scores. A chi-squared test and Mann–Whitney *U*-tests were performed to investigate whether there were significant differences between genders and the two clinic samples.

Standard statistical methods were applied to evaluate the psychometric properties of the PUTS with regards to scale assumptions (range of item scores' means and standard deviations, range of corrected item-total correlations), acceptability (total scores distribution, floor and ceiling effects), reliability (internal consistency: Cronbach's alpha) and validity (convergent and discriminant construct validity, Spearman's rank correlation coefficients). Internal statistical review ensured that the methodology for the validation of the PUTS in an adult sample of patients with TS followed the standard rules for psychometric instruments [13].