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Combined evaluation of personality, risk and coping in MS patients: A step towards individualized treatment choice – The PeRiCoMS-Study I

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ABSTRACT

Background: Multiple sclerosis (MS) is a chronic inflammatory neurological disease requiring disease-modifying treatment (DMT). To provide patients with the optimal individual therapeutic option, treatment recommendations should be based not only on individual disease course and DMT specific benefit-risk estimates, but also on patient's individual characteristics such as personality, risk attitude and coping strategies. However, these characteristics are difficult to objectify in clinical routine practice without the support of appropriate evaluation instruments.
Objective: To identify and to assemble an objective test battery measuring personality, risk attitude and coping strategies in MS patients.
Methods: A comprehensive literature search was performed to obtain all questionnaires assessing personality, risk attitude and coping strategies. Availability in German language, validation in a published normative collective and a reliability of >0.70 were required for our purposes. Based on these criteria, we chose the Big-Five-Personality Test, UPPS Impulsive Behaviour Scale, Domain-Specific Risk-Taking scale (DOSPERT), Brief-COPE and Stress & Coping Inventory (SCI). Results were compared to published normative controls of the respective questionnaires.
Results: Out of 22 MS patients (7 males, 15 females) participating in this study, 19 (86.4%) completed all questionnaires. The median completion time was 45 min (min–max range: 25–60 min). The median scores of the MS group were within the average range of published control samples in all questionnaires.
Conclusions: We report that traits of personality, risk attitude and coping strategies can be effectively and feasibly tested in MS patients by the instruments used in our exploratory study. There were no differences between MS patients and healthy controls, thus enabling assessment without being influenced by the diagnosis of MS. After validation in a larger cohort the "PeRiCoMS"-battery will be useful as another step towards a more individualized shared-decision-making in every day routine practice.

1. Introduction

Multiple sclerosis (MS) is a chronic inflammatory neurological disease which requires long-term disease-modifying treatment (DMT) intended to reduce inflammation and to prevent the potential risk of future disability. Currently available DMTs differ substantially in their benefit-risk profiles, varying from DMTs with moderate efficacy/low risk (interferon-beta, glatiramer acetate, dimethylfumarate, teriflunomide, daclizumab) and DMTs with higher efficacy/considerable risk (natalizumab, fingolimod, alemtuzumab) [1–7].

To provide patients with the optimal individual therapeutic option and to increase patient's adherence and treatment outcome, physicians' treatment recommendations usually weigh the individual disease course and the benefit-risk estimate of a DMT. However, patient's individual characteristics such as personality, risk attitude and coping strategies are rarely taken seriously into consideration despite being essential in individualized and shared decision making. These characteristics are difficult to objectify in clinical routine practice without the support of evaluation instruments, which are appropriate in quality, validity, reliability and time effectiveness.

Data on personality, risk attitude and coping strategies in MS patients have yielded controversial results. While some authors did not detect differences in personality traits between MS patients and healthy controls, others reported increased neuroticism and reduced extraversion in MS patients [8–14]. However, it seems that these differences were mostly due to an increased level of depression and anxiety in MS

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patients [12,14]. Personality traits and presence of MS disease activity were reported to influence the type of coping strategies adopted [15,16]. Generally, passive coping strategies seem to be more prevalent in MS patients and become even more prevalent as the disease progresses [17]. Positive coping strategies positively influence patients' quality of life [18,19]. With respect to risk attitude, results are very controversial: some studies reported MS patients to be more prone to risky behaviour, while other studies showed no difference or even greater risk aversion in MS patients compared to healthy controls [20–23]. However, risk seeking patients are more likely not to choose a DMT [24].

In order to increase patient's adherence and treatment outcome, the goal of the present study was to assemble an objective test battery measuring personality, risk attitude and coping strategies that could be used in routine practice.

2. Material and methods

A comprehensive literature search (Pubmed; 1900 to 01-MAR-2016, original research papers only) was performed to obtain all questionnaires assessing personality, risk attitude and coping strategies. To be considered for inclusion in our testing battery, questionnaires had to be validated in a published normative collective with a reported reliability of at least 0.70 and had to be available in German language.

Three questionnaires assessing personality traits (Big-Five-Personality test, temperament and character inventory (TCI) and NEO five-factor inventory), two questionnaires assessing risk attitude (UPPS Impulsive Behaviour Scale and Domain-Specific Risk-Taking scale, DOSPERT) and two questionnaires assessing coping strategies (Brief-COPE and Stress & Coping Inventory, SCI) fulfilled our inclusion criteria. Regarding personality, we chose to use only one questionnaire for feasibility reasons considering the extensive completion time of all personality questionnaires available. We opted for the Big-Five-Personality Test because it has the shortest reported median completion time.

2.1. Big-Five-Personality Test

The Big-Five-Personality Test was developed according to the principles of the five personality dimensions: extraversion, neuroticism, consciousness, openness and agreeableness [25]. This test also assesses three basic individual needs, i.e. the need for achievement, the need for power and the need for safety. Questions to find out whether a person is giving answers based on social desirability are also included. Higher scores indicate a higher level of the respective attribute, e.g. a higher level of extraversion.

2.2. UPPS Impulsive Behaviour Scale

Risk taking is highly related to impulsivity, therefore the UPPS Impulsive Behaviour scale measures impulsivity by 4 subscales: urgency, lack of premeditation, lack of perseverance and sensation seeking. Higher scores (range from 1 to 4) indicate a higher level of the respective attribute, i.e. a higher level of urgency or lack of premeditation [26,27].

2.3. DOSPERT

The DOSPERT represents a “DOmain-SPEcific Risk Taking” scale assessing risk taking in different settings: financial, health/safety, ethical, recreational and social [28]. The German version further splits the financial scale into investing and gambling [29]. The DOSPERT consists of three parts, each with the same 40 items/activities. In the first part, patients have to estimate the likelihood of themselves engaging in a given activity, in the second part they have to scale the risk level of a given activity, and in the third part they have to rate the possible benefits of a given risk. All items are assessed on a 5-point Likert scale. Higher scores indicate that a person is more likely to engage in a given activity, that a person thinks a given activity bears higher risk, and that a person perceives higher benefits from it.

2.4. Brief-COPE

The German version of the Brief-COPE is an abbreviated inventory (28 questions) assessing 14 coping strategies typically used by patients to deal with stress [30]. Coping strategies are clustered into four categories: Focus on positive coping, active coping, support coping and evasive coping. Higher scores (range from 1 to 4) indicate that a person is more likely to adopt the given coping strategy.

2.5. Stress and Coping Inventory

The Stress and Coping Inventory (SCI) evaluates the patient's perception of stress in a given stress situation and eventually subsequent coping strategies. Higher scores on the Likert scale indicate stronger perception of stress, stronger stress symptoms, and frequent adoption of certain coping strategies [31].

2.6. Study design

We administered these questionnaires to 22 consecutive patients of the MS Clinic of the Department of Neurology, Medical University of Innsbruck, Austria, between March 19 and May 21, 2015. Patients had to have a confirmed diagnosis of MS according to the revised McDonald criteria 2010 and no severe cognitive dysfunction (defined as Mini Mental Status Examination < 27) [32]. Exclusion criteria included history of neurological disease other than MS, drug or alcohol dependence, psychiatric disease other than psychological problems attributable to MS, or MS relapse (or steroid treatment) within twenty-four weeks prior to participation. Additionally, the Beck Depression Inventory-I (BDI-I) was included to screen patients for symptoms of depression. A score equal to or higher than 18 indicates depression [33]. BDI-I scores were correlated with the results of the questionnaires described before.

Demographic data (disease duration, disease course, Expanded Disability Status Scale [EDSS] [34]) were obtained from all patients.

2.7. Ethics

This study was approved by the ethics committee of the Medical University of Innsbruck. All patients gave written informed consent.

2.8. Statistics

Results from the 22 MS patients included in this study were compared to those of published normative controls of each questionnaire [25,26,28,30,31]. For assessment of distribution the Kolmogorov-Smirnov test was used. Differences were assessed using ANOVA comparison for continuous variables with normal distribution; otherwise Mann-Whitney-*U* test was applied. All calculations were performed with SPSS 23.0 (SPSS Inc., Chicago, IL, USA). Statistical significance was defined as p-value < 0.05. p-Values were corrected for multiple testing by Bonferroni correction, if appropriate.

3. Results

We included 22 consecutive patients (15 females, 86.2%) in this exploratory study. Mean age was 42.3 years (SD 8.8 years) and did not differ significantly from the mean age of the control samples except for the Brief-COPE control group (71.6 years; SD 8.9; $p < 0.001$) (Supplement Table 1). Seventeen patients (77.3%) had relapsing remitting MS (RRMS), three (13.6%) secondary progressive MS (SPMS) and two (9.1%) primary progressive MS (PPMS). Mean disease duration was 9.0 years (SD 8.1) and median EDSS was 2.5 (range 0–6.5). Sixteen (72.7%) patients received DMT (6 interferon beta; 3 glatiramer acetate;