Occupational stress and personality traits in multiple sclerosis: A preliminary study

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ABSTRACT

Multiple Sclerosis (MS) is a demyelinating and neurodegenerative disease of the central nervous system, causing a wide range of neurological and psychological symptoms. Impairment of ambulation and cognition in particular are associated with work difficulties and unemployment. Although many aspects of work status have been investigated in MS, there are no reports on factors that predict the development of occupational stress, prior to job loss. The aim of this preliminary study was to ascertain if personality traits predispose MS patients to occupational stress. We evaluated 26 MS patients using physical disability scales and self-report questionnaires focused on mood, fatigue, and personality [measured with the NEO Five Factor Inventory]. The primary outcome measure was the Occupational Stress Indicator [OSI]. Results showed significant positive correlations ($p < .05$) between high neuroticism, and occupational stress. Conversely, low extraversion and conscientiousness were also associated with job stress. The direction of these correlations was consistent with prior research showing that high neuroticism, and low extraversion and conscientiousness, are risk factors for MS disease severity as evidenced by brain atrophy, cognitive impairment and adaptation in MS. We are developing interventions to help patients cope with these maladaptive personality dispositions in the hope that employment may be maintained.

1. Introduction

Multiple Sclerosis [MS] is a chronic inflammatory, demyelinating and degenerative disease of the central nervous system usually diagnosed during the second to fourth decades of life, ordinarily at the peak of work productivity. Yet, within 15 years of diagnosis two-thirds of MS patients are unemployed (Uccelli et al., 2009). In addition to the obvious economic benefits, employment boosts self-esteem, socialization, and health (Johnson et al., 2004). Therefore, identifying risk factors for job loss is a key objective for clinical medicine. In addition, it makes some sense to determine the factors that lead to problems that unfold prior to job loss, such as occupational stress.

In MS research, the adverse impact of impaired mobility and cognitive impairment on work stability is well established (O'Connor et al., 2005; Rao et al., 1991).

We (Benedict et al., 2005) have also explored the potential role of personality traits using the well established Five Factor Model [FFM] (Goldberg, 1993; Marshall et al.,1994). The FFM encompasses five phenotypic traits: Neuroticism, Extraversion, Openness, Agreeableness, and Conscientiousness. There is considerable evidence that these traits influence a range of health outcomes including heart disease (Izawa et al., 2011), cardiovascular risk factors (Versey and Kaplan, 2012), major depression (Nabi et al., 2010), mortality among the aged (Neuvonen et al., 2014) and general medical morbidity (Chapman et al., 2007). As personality influences coping with disease (Ratsep et al., 2000) there may very well be an association between baseline personality traits and risk for job loss over the longer term.

The FFM is most commonly measured using the NEO Personality Inventory, or its short form the Five Factor Inventory [NEOFFI] (Costa and McCrae, 1992b). The NEOFFI is well suited to medical settings (Chapman et al., 2007), and is valid in the MS population (Schwartz et al., 2011). There is good evidence that NEOFFI derived

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personality traits are associated with several aspects of the MS disease state. Cognitively-impaired MS patients have higher than average Neuroticism, and lower Extraversion and Conscientiousness (Benedict et al., 2001). Brain atrophy (Benedict et al., 2008) is also associated with these same traits. Recently, we have found that traits measured within the NEOFFI mediate and moderate the effects of brain atrophy on cognitive and neuropsychiatric features of MS (Benedict et al., 2013).

We are aware of only two cross-sectional investigations of personality and employment in MS. In one study of 120 patients accounting for 8 clinical domains (Benedict et al., 2005), conscientiousness was retained in a final hierarchical regression model predicting vocational disability, along with disease duration and cognitive function. This result was recently replicated by Strober and colleagues (Strober et al., 2012) who found that persistence, a component of Conscientiousness, predicted employment status in 101 MS patients after controlling for other clinical predictors.

In our most recent work, we have endeavored to study MS patients who are struggling in the work place prior to job loss. In one approach, we examined online monitoring of work problems and use of accommodations (Benedict et al., 2014; Frndak et al., 2015). Recent work from other groups is exploring the role of fatigue and psychological factors in early work status changes (Schiavolin et al., 2013). In this report, following on research demonstrating adverse effects of stress in MS (Karagkouni et al., 2013), we turn our attention to the matter of isolating the factors that may cause occupational stress in MS patients, that till now has never been investigated. In this study, we operationalized occupational stress with the Occupational Stress Indicator [OSI] (Cooper et al., 1988) which quantifies a gamut of stress components, including type A behavior, coping strategies, job satisfaction and medical problems.

Our preliminary work tries to identify specific personality traits more susceptible to occupational stress in MS patients by correlating NEOFFI scores with OSI scales. Since previous studies found conscientiousness as linked to working disability, the primary purpose of our study is to verify if conscientiousness has a positive role in reducing occupational stress. As for the other personality traits do not exist other literature data on MS patients, our work is aimed to describe the relation between other personality traits and job stressors.

2. Material and methods

2.1. Participants

We screened 33 consecutive [24 females] patients presenting for routine follow-up MS care at the IRCCS "Santa Lucia" Foundation and "San Filippo Neri" Hospital in Rome (Italy). All patients carried a diagnosis of MS (Lublin et al., 2014) and were receiving treatment at a specialized tertiary care, MS center. All participated as unpaid volunteers, as is the custom in Italy. The research protocol was approved by the local Ethical Committee and all participants provided informed consent.

Exclusion criteria were as follows: unemployment; presence of current/past medical or psychiatric disorders other than MS, presence of a severe cognitive impairment, evidence of a clinical relapse or steroid pulse treatment within eight weeks previous evaluation. Six patients were excluded on the basis of these criteria. Specifically two suffered from current or past psychiatric disorders, one had relapse in the past eight weeks, and three had severe cognitive impairments. Patients who had five or more scores under the cut-off in three cognitive domains were considered affected by a severe cognitive impairment (Nocentini et al.,

Table 1
Demographic and clinical data of MS patients enrolled.

	MS study cohort (n =26)	
	Mean (SD)/n	Range (min–max)
Demographic and clinical measures		
Age (years)	40.7 (8.5)	25.0–61.0
Gender (female/male)	17/ 9	–
Educational level (years)	15.4 (3.0)	8.0–18.0
EDSS score	2.9 (1.2)	1.0–6.0
Disease duration from MS diagnosis (months)	151.3 (101.7)	12.0–480.0
MS disease course		
Relapsing remitting	22	–
Secondary progressive	4	

Note: EDSS=Expanded Disability Status Scale.

2006) and excluded from the study, leaving a final sample of 26 employed MS patients enrolled.

The demographic and commonly recognized disease characteristics for the sample are presented in Table 1. Age ranged from 25 to 61 years, with a mean of 40.7 ± 8.5 years. The disease course, as defined by consensus standards (Lublin and Reingold, 1996), was relapsing-remitting (22 patients) and secondary progressive (4 patients). At the time of evaluation seven patients were not treated with immunomodulatory drugs, twelve were treated with interferon β, three with glatiramer acetate, two with natalizumab and two with fingolimod.

2.2. Clinical assessment

All eligible MS patients underwent a clinical/neurological evaluation using a standardized scale, the Expanded Disability Status Scale [EDSS], which emphasizes physical problems and ambulation (Kurtzke, 1983). As mood and anxiety disorders are common in MS (Ghaffar and Feinstein, 2007), we employed validated scales of both depression and anxiety disorder symptoms, called the Chicago Multiscale Depression Inventory [CMDI] (Nyenhuis et al., 1995; Solari et al., 2004) and the State Trait Anxiety Inventory Y [STAI-Y] (Spielberger, 1983), respectively. Fatigue was measured using the Modified Fatigue Impact Scale [MFIS] (Fisk et al., 1994). These three questionnaires have good internal consistency calculating Cronbach's alpha coefficients on our data (CMDI subscales: range 0.88–0.97; STAI Y: 0.96 for state anxiety; MFIS subscales: range 0.80–0.96).

The NEO Five Factor Inventory [NEOFFI] is a reliable personality test (Costa and McCrae, 1992a, 1992b) recently validated in MS (Schwartz et al., 2011), that provides gender corrected standard scores on the FFM traits described above. This questionnaire consists of 60 items (12 items for each facets) with a five-point Likert answer scale ranging from 'strongly agree' to 'strongly disagree'.

Neuroticism is the degree of emotional responsiveness and proclivity for negative mood states, propensity for pessimism and worry (i.e. sample question: "*I am not a worrier*").

Extraversion is the degree of dependence upon external stimulation for arousal and tendency to be outgoing and sensation-seeking (i.e. sample question: "*I like to have a lot of people around me*"). *Openness* refers to a person's interest in and pursuit of new ideas and creativity (i.e. sample question: "*I often try new and foreign foods*"). *Agreeableness* is the extent to which a person is socially skilled, empathic, and genuinely interested in the activities of others (i.e. sample question: "*Most people I know like me*"). *Conscientiousness* is the extent to which a person is task-oriented; achievement striving; proclivity to be well-organized and deliberate (i.e. sample question: "*I keep my belongings neat and clean*").