

Distress in Parkinson's disease: contributions of disease factors and metacognitive style

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Summary Research has suggested that the high levels of depression and anxiety observed in Parkinson's disease are a primary consequence of its pathophysiology. This study aimed to test the hypothesis that a psychological factor, metacognitive style, is significantly associated with distress, independent of previously identified disease-related risk factors. Distress, metacognitive style and disease factors were assessed in 44 people with a diagnosis of Parkinson's disease. People with a specific metacognitive style had an increased vulnerability to distress over and above previously identified disease factors; this suggests future directions for the development of psychological interventions.

Declaration of interest None.

Around 40% of people with Parkinson's disease experience anxiety, depression or a combination of the two (Brooks & Doder, 2001). These rates are much greater than those observed in the general population, although the reasons for this are unclear. Factors associated with distress in Parkinson's disease have included hallucinations, cognitive impairment, stage of illness and functional disability (Tandberg *et al*, 1997). However, these disease-related factors only account for a modest proportion of the variance in distress; psychological factors appear equally, if not more important (Gotham *et al*, 1986; MacCarthy & Brown, 1989). The 'self-regulatory executive function model' (Wells & Matthews, 1994) identifies several inter-related but distinct components of cognition linked to the development and maintenance of emotional disorder. It proposes that people hold beliefs about their own thought processes and these

guide their responses to distressing cognitive or body state intrusions (pain, images, etc.). The model emphasises the role of negative beliefs about thoughts (e.g. 'worrying is harmful') and positive beliefs about a necessity to engage in worry or ruminative styles of coping. A cluster of responses tied to these beliefs (self-focused attention, worry/ruminative processing, attentional bias) underlie a wide range of emotional disorders (Wells, 2000). This study tested the hypothesis that metacognitive style is associated with distress in Parkinson's disease independent of previously identified disease factors.

METHOD

Participants

Participants were recruited from two branches of the Parkinson's Disease Society and three out-patient clinics in the north of England. They were recruited as part of a study examining visual hallucinations in Parkinson's disease, the results of which are reported elsewhere (Allott, 2002). Participants were required to have a diagnosis of idiopathic Parkinson's disease (UK Parkinson's Disease Society Brain Bank Criteria; Daniel & Lees, 1993), speak English as their first language and to have given informed consent. Exclusion criteria included dementia with Lewy bodies or learning disabilities, marked delirium, substance misuse, severe head injury or a reported history of psychiatric disorder prior to the onset of Parkinson's disease.

Measures

Distress, the dependent variable, was measured using the Hospital Anxiety and Depression Scale (HAD; Zigmond & Snaith, 1983). Metacognitive style was measured using the Metacognitions Questionnaire – 30 (MCQ-30; Wells & Cartwright-Hatton, 2004). This contains five sub-scales: positive beliefs about worry; negative beliefs about worry, focusing on its

uncontrollability and danger; negative beliefs about thoughts, concerning the need for control; low cognitive confidence; and cognitive self-consciousness. A higher total score on the MCQ-30 indicated a more maladaptive metacognitive style.

Disease-related factors identified by previous research as associated with distress in Parkinson's disease were also measured. These included medication regimen (daily L-dopa equivalent dose; Fenelon *et al*, 2000; Fung *et al*, 2001; Chen, 2002), stage of illness (Hoehn and Yahr Scale; MacCarthy & Brown, 1989), cognitive functioning (Mini-Mental Parkinson's; Mahieux *et al*, 1995) and presence of hallucinations (Revised Hallucinations Scale; Morrison *et al*, 2000). Participants were interviewed at home, where the questionnaires and cognitive testing were completed.

Statistical methods

Hierarchical regression was used to test whether a more maladaptive metacognitive style would predict heightened distress, independent of disease factors. Successive disease variables were entered into the equation followed by metacognitive style. With a sample size of 44 and five variables entered into the regression, the study had 80% power to identify an R^2 of 0.25 at the $P < 0.05$ significance level. A logarithmic transformation was computed for the dependent variable (HAD) to satisfy assumptions of normality. Collinearity statistics showed that tolerance values of individual variables were acceptably high for all multiple regression equations.

RESULTS

We recruited 52 participants and excluded 8 because of recent neurosurgery, a history of alcohol misuse, pre-existing learning disability, diagnoses of dementia with Lewy bodies and bipolar disorder, and incomplete questionnaires (3).

The mean age of the remaining 44 (33 males) participants was 68.52 years (s.d.=9.61, range 25–81) and mean duration of illness was 7.19 years (s.d.=5.53, range 6 months to 23 years). The five stages of illness were represented: I (2, 5%), II (6, 14%), III (15, 34%), IV (13, 30%) and V (8, 18%); 17 (39%) and 19 (43%) of participants reached 'possible caseness' on the HAD for depression and anxiety, respectively. All except one were receiving

anti-parkinsonian medication and six were receiving antidepressants.

Metacognitive style and distress

With metacognitive style and the disease variables entered into the equation, the multiple R was 0.641 and significant ($F(5,38)=5.290$, $P<0.001$). These variables accounted for 33% of the variance in distress. Metacognitive style showed a significant and independent association with distress, contributing 8% to the variance ($F(1,38)=5.271$, $P<0.05$).

To determine which of the MCQ sub-scales best predicted distress, a second multiple regression was conducted. A combination of direct entry (disease variables) and forward selection methods (MCQ sub-scales; selection criteria $P<0.05$) was used. Negative beliefs about worry was the sub-scale explaining most variance in distress, contributing 11.6% ($F(1,38)=7.924$, $P<0.01$). Alongside the disease factors, these variables showed a multiple R of 0.667 ($F(5,38)=6.080$, $P<0.001$) and accounted for 37% of the variance in distress. Of the disease factors, only stage of illness ($\beta=0.292$, $P<0.05$) and propensity for hallucinations ($\beta=0.392$, $P=0.011$) were significant predictors of distress.

DISCUSSION

These findings confirm the hypothesis that a more maladaptive metacognitive style is associated with heightened distress in Parkinson's disease. More specifically, people who held stronger negative beliefs about worry, focusing on its uncontrollability and danger, were more likely to report elevated levels of distress. This is in keeping with previous studies investigating such beliefs in anxiety disorders (Wells, 2000) and challenges the notion that distress in Parkinson's disease is primarily a consequence of pathophysiology.

Two methodological limitations should be highlighted. The sample was recruited as part of another study investigating visual hallucinations in Parkinson's disease and was drawn from both community self-help groups and out-patient populations. This may have led to a bias towards recruiting people with hallucinations or less severe disease. Although some bias towards male participation was evident, the age, disease severity, duration of illness, and rates of anxiety, depression and hallucinations were comparable with those reported elsewhere (Gotham *et al*, 1986; Di Rocco *et al*, 1996).

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Like previous studies, this research found increased anxiety and depression in the later stages of illness and when hallucinations were reported (Tandberg *et al*, 1997; Felon *et al*, 2000). Nevertheless, when these and other important disease factors were included in the multivariate analyses, metacognition remained a significant and independent predictor of distress. This is the first time that metacognitive beliefs have been investigated in chronic illness. The similarity between the distress observed in Parkinson's disease and other non-neurological movement disorders (e.g. arthritis; Gotham *et al*, 1986) suggests that these same results might be found in other chronic illnesses. Future research could investigate this possibility.

Worry is a normal phenomenon commonly reported in the general population and by people experiencing a range of chronic illnesses (Wells & Morrison, 1994; Fortune *et al*, 2000). Metacognitive beliefs may transform the meaning of mental events such that worry is itself appraised as uncontrollable and harmful. In this situation, individuals are likely to worry about Parkinson's disease and worry about their worry, thereby amplifying distress. This explanation resembles cognitive conceptualisations of generalised anxiety disorder, for which specific cognitive-behavioural techniques have been devised (Wells, 2000). Future research should investigate whether these same techniques might ameliorate distress in Parkinson's disease.

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