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Distinct psychological distress trajectories in rheumatoid arthritis: Findings from an inception cohort

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ABSTRACT

Objective: As with other chronic physical illness, rates of depressive disorder are high in rheumatoid arthritis (RA). The aim of the current study was to identify distinct trajectories of psychological distress over 10 years in a cohort of RA patients recruited very early in the course of the disease.
Methods: Psychological distress as measured by the Hospital Anxiety and Depression Scale total score was assessed annually in a subgroup of 784 patients enrolled in a multi-centre RA inception cohort (Early RA Study). A latent growth mixture modelling (GMM) approach was used to identify distinct psychological distress patterns.
Results: Four distinct psychological distress trajectories were observed: low-stable (68%), high-stable (12%), high-decreasing (9%) and low-increasing (11%). Symptoms of pain, stiffness and functional impairment were significantly associated with levels of psychological distress at the time of diagnosis and after 3 years; serological markers of disease activity (ESR and CRP) were not.
Conclusions: Although the majority of individuals developing RA experience little or no impact of the effects of the disease on their psychological well-being, a significant proportion experience high levels of distress at some point which may be related to their subjective appraisal of their condition. Assessment and treatment of psychological distress should occur synchronously with somatic symptoms.
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Introduction

Chronic physical illnesses, such as rheumatoid arthritis (RA), that are painful and disabling not only impact on a person's ability to complete normal daily activities (e.g. dressing, bathing, walking, etc.) but also have a negative impact on psychological well-being. The prevalence of depressive disorder in individuals with RA is estimated to be 13–20% [1]; a rate 3–4 times higher than the general population and similar to other chronic physical illnesses [2,3]. Psychological well-being in chronic illness is not only essential in terms of health-related quality of life, but also with regard to disease progression and outcomes. For example, in RA depression has been linked with adverse clinical and psycho-social outcomes including increased risk of mortality [4–6], job loss [7], and worse quality of life [3].

A number of studies have examined the psychological response to the onset of RA. Although findings are broadly ambiguous, there is some indication of a small improvement in symptoms of psychological distress particularly during the early course of the disease. Five studies have reported significant improvement in psychological distress [8–12], whereas only one study has shown a significant worsening [13]. However, a further seven studies find that levels are stable (or rather, do not change significantly) over time [14–20]. These studies have typically focussed on mean scores for the sample as a whole ignoring individual trajectories.

Persson et al. (2005) attempted to elucidate distinct response trajectories following the onset of RA by first splitting their sample of 158 patients with recent onset RA at the median baseline level of distress and then by whether levels of psychological distress decreased over time [9]. Those below the median at baseline showed little change in distress over time. However, for individuals scoring above the median baseline level of distress there was a clear differentiation into a group with a decline in distress over time (38%) and those with consistently high levels of psychological distress (12%). This finding suggests heterogeneity in the psychological response to the onset of RA. However, the groups derived are likely to be a result of the process used to define them and these findings need to be confirmed. In a recent study, Morris et al. [21] employed cluster analysis to identify three distinct long-term patterns of depressive symptoms (low/none 66%, intermittent 25%, chronic 9%). However, this study was limited by the large range in disease duration for the sample at study entry, on average greater than 10 years. Resultantly,

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their analyses would not be able to identify changes that may occur early in the disease course.

Several studies of psychological distress in individuals following breast cancer surgery, heart surgery or a myocardial infarction have attempted to define distinct trajectories using sophisticated analytical methods. The salient finding of these studies is that the majority of individuals experience consistently low levels of psychological distress [22–28]. In other words, most individuals can be seen as being "resilient" to the potential trauma caused by these conditions [29]. This is further supported by studies examining distinct trajectories of fatigue and vital exhaustion in individuals with heart failure [30,31].

In the current study, we used a latent growth mixture modelling (GMM) approach to identify distinct psychological response trajectory classes over 10 years in a large multi-centre RA inception cohort. This is the first study to examine distinct psychological distress trajectories in a cohort of RA patients recruited very early in the course of the disease. Furthermore, we examine trajectories using this type of approach over a longer period than any other study using a clinical population. We hypothesised that i) at the group level there would be an initial improvement in psychological distress early in the course of the disease followed by a prolonged period with stable levels of distress, and ii) we would find distinct psychological response trajectories, but with the majority of individuals experiencing consistently low levels of psychological distress. In addition, we examined the distribution of demographic and clinical characteristics across the distinct latent trajectory classes in an attempt to better understand potential antecedents of psychological distress in this patient setting.

Method

Sample

The sample used in the current analysis consisted of a sub-sample of individuals from the Early RA Study (ERAS). This is a prospective inception cohort initiated in 1986, with participants recruited from rheumatology clinics at nine UK hospitals. Inclusion criteria for the study were all adults receiving a diagnosis of Rheumatoid Arthritis, with symptoms of less than 2 years and prior to the initiation of disease-modifying medication. Between 1986 and 1997, 1460 individuals with a median duration of symptoms of 6 months (83% ≤12 months) were recruited and continue to be followed up yearly. Full details of the procedure have previously been described [32]. Three of the ERAS centres (Grimsby, Winchester and Basingstoke) collected information on psychological distress using the Hospital Anxiety and Depression Scale ($N = 784$). The HADS was completed during the yearly follow-up clinic appointment in conjunction with other self-report tools.

Measures

Psychological distress

The Hospital Anxiety and Depression Scale (HADS) is a 14-item self-report questionnaire, with items split equally into two correlated anxiety and depression subscales [33]. Recent research has indicated that rather than assessing two separate constructs a unidimensional structure exists [34], hence the total sum score was used as a marker of general psychological distress. In the current sample, internal consistency of the HADS total score at the baseline assessment was high ($\alpha = .87$). Total scores can range between 0 and 42, with previous research indicating that scores of 14, or greater, achieve an optimal balance between sensitivity and specificity for identifying clinically significant levels of anxiety or depression [35].

Demographic characteristics

Socioeconomic status was assessed using social class according to the Registrar General's classification and highest level of educational qualification. Individuals in Social Classes IV or V were categorised as "disadvantaged". Social Classes I, II and III were categorised as "Not disadvantaged". Individuals who left school with no educational qualifications were categorised as "low education" whereas those who achieved at least basic educational qualifications were categorised as "satisfactory education". Employment status at the baseline assessment and smoking status was also included in the analysis.

Disease severity

In RA, inflammation of the synovial membrane that lines the joints and tendon sheaths causes the joints to become swollen and painful and stiffness limits their movement leading to impaired ability to complete general activities of daily living. Measures of each of these elements indicating disease activity and symptom severity were included in the analysis.

Swelling and inflammation. Inflammation was indexed using two routinely collected serological markers of generalised inflammation (erythrocyte sedimentation rate [ESR] and C-reactive protein [CRP]) and swelling by the number of swollen joints (Swollen Joint Count [SJC]).

Pain. As an index of joint pain, the rheumatologist concurrently noted whether the patient reported the joints to be tender (Tender Joint Count [TJC]). Pain was additionally assessed using a 100 mm visual analogue scale (VAS) completed by the patient and anchored at 0 "no pain at all" and 100 "worst pain ever".

Disease activity. Overall disease activity was assessed using the Disease Activity Score, a composite measure including ESR, SJC and TJC [36]. Scores for the DAS range between 0 and around 10. Generally, scores over 5 indicate severe disease and less than 3 low disease activity.

Stiffness. Stiffness was assessed using the self-reported duration, in hours, of early morning stiffness.

Functional impairment. Functional impairment was operationalised using the UK version of the Health Assessment Questionnaire (HAQ) disability index [37]. The HAQ consists of 20 items concerning eight activities of daily living (dressing and grooming, arising, eating, walking, hygiene, reach, grip and other activities). Items are scored on a four-point ordinal scale ranging from 0 "without any difficulty" to 3 "unable to do". In addition, for each activity respondents also report whether they receive assistance from other people or use assistive devices. The aggregated score is the average of the maximum rating within each of the eight activities of daily living adjusted for the use of devices and assistance. Scores range between 0 and 3 with higher values indicating greater disability. Scores greater than 1 indicate that an individual has moderate disability, and above 2 severe disability, although specific cut-offs have not been defined.

Statistical analysis

Analysis was conducted using M*plus* 5.2, a statistical package for generalised latent variable modelling that allows for both continuous and categorical latent variables. Data for the first 10 years following diagnosis were used in the analysis. Data for several variables (ESR, CRP, SJC, TJC, early morning stiffness and HAQ) were positively skewed and were therefore square root transformed in the analysis.

Growth mixture modelling

Conventional growth modelling approaches, e.g. hierarchical linear models [38], assume that individuals come from a single population and that a single growth trajectory, defined by the random intercept and slope parameters, adequately approximates an entire population. GMM relaxes this assumption allowing for different groups (latent classes) of individual growth trajectories with class

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