

# Early symptoms and treatment duration in polymyalgia rheumatica: a joint modelling approach.

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## Abstract

Polymyalgia rheumatica (PMR) is a common inflammatory disease in older people, for which the established treatment is glucocorticoids. Long-term glucocorticoid use increases the risk of side effects, motivating research into predicting treatment duration. Early trajectories of PMR symptoms are potentially important predictors that have not been incorporated in previous research. This study will jointly model longitudinally measured PMR symptoms with time to treatment discontinuation, to develop a dynamic prediction model.

An inception cohort of 652 patients diagnosed with PMR in UK primary care were followed up for two years via repeated questionnaire mailings. Baseline predictors of treatment duration were analysed using an interval-censored accelerated failure time model. Longitudinal pain, stiffness and disability ratings were the outcomes in separate linear mixed models, with piecewise linear fixed and random effects of time. Multiple imputation was used to account for missing predictor data.

In multivariable survival analysis, male gender (acceleration factor (AF) 0.78, 95% CI 0.63-0.95) and the ability to raise the hands above the head (AF 0.78, 95% CI 0.62-0.99) were associated with shorter treatment duration. For the longitudinal models, females and younger participants reported more severe pain and stiffness at all follow-up times. Participants with worse baseline fatigue and lower socioeconomic status reported more severe pain, stiffness and disability throughout follow-up. Further results will be presented at the conference.

Having considered longitudinal and survival models separately, the next stage of this research is to combine symptom trajectories in a multivariate framework and to model these jointly with treatment duration.

## Patient and Public Involvement (PPI)

The design of PMR Cohort Study was developed through discussions with patients with PMR. Specifically, they commented on the content and format of the questionnaires. Also the award holder (Chris Morton) attended the PMRGCAuk annual members event to discuss patient experiences of steroid use. The possibility of using PPIE to help shape future research stemming from this thesis (e.g. through work with local branches of the charity) is also currently being explored.