Socioeconomic deprivation and its relationship with worse disease outcomes in rheumatoid arthritis: impact beyond traditional risk factors

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Editorial

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Editorial

Socioeconomic deprivation and its relationship with worse disease outcomes in rheumatoid arthritis: impact beyond traditional risk factors

This editorial refers to 'Socioeconomic deprivation is associated with reduced response and lower treatment persistence with TNF inhibitors in rheumatoid arthritis', by Zhao *et al.*, 2024;63:648–56.

There is accumulating evidence in the rheumatology literature about the relationship between different socioeconomic indicators, treatments and treatment outcomes [1]. In RA, studies have shown reduced access to treatment with biological DMARDs (bDMARDs) in countries with a lower socioeconomic status, which may also be linked to worse disease outcomes [2, 3]. These studied relationships are complex and multifactorial. A further characterization of the associations between socioeconomic indicators and treatment outcomes, taking into account related factors such as obesity, smoking and comorbidities, could help to identify not only areas of inequity, but also potential areas for intervention. In this issue, Zhao *et al.* study the relationship between socioeconomic deprivation and treatment response and treatment persistence of TNF inhibitors in RA [4].

Longitudinal data from patients starting their first TNF inhibitor (TNFi) were obtained from two large British bDMARD cohorts. It was shown that compared with the least deprived group, patients from the most deprived group had 0.30 units higher DAS28, a 24% lower odds of achieving low disease activity and 11% lower odds of achieving remission. In addition, median time to treatment discontinuation was 1 year shorter in the most deprived group (2.6 years *vs* 3.8 years in the least deprived group). This difference in treatment discontinuation appeared to be driven by ineffectiveness, rather than by adverse events [4].

As a proxy for socioeconomic deprivation, the authors used the Index of Multiple Deprivation (IMD). This index, developed for use in the UK, defines the relative deprivation of individual neighbourhoods, based on factors such as income, employment, education and living environment [5]. Based on their residential postcode, patients receive a deprivation rank score. Although the IMD, as a validated score, provides interesting opportunities for research, the score also has its limitations.

Since the IMD is based on geographical areas, the score is not an indicator of individual patient's level of welfare. A wealthier person living in an area of low deprivation will receive an identical score to an individual with a higher level of poverty living in the same area. Therefore, the score does not allow us to study the socioeconomic welfare of individual patients.

Specifically, data on multiple indicators of socioeconomic welfare, collected at both the level of individual patients and at the level of neighbourhoods and regions (e.g. education, income, employment, living environment, access to care) could provide us with important insights in the mechanisms underlying the relationship between socioeconomic deprivation and (longitudinally measured) disease outcomes in RA. Such data could answer remaining question such as 'What are the health outcomes of patients with a higher socioeconomic status, living in socioeconomically deprived areas?' and 'How do health outcomes develop if a patients' socioeconomic status or living environment change?', and thereby identify potential areas for intervention.

Well-known patient indicators related to socioeconomic status, such as smoking and obesity, were studied by the authors but the precise causal relationship between socioeconomic deprivation (measured by IMD) and these indicators is difficult to define. In general, it seems to make most sense that socioeconomic deprivation is an important cause of indicators such as smoking and obesity, and may also contribute to additional factors such as disease severity and the presence of comorbidities. In this case, indicators such as smoking and obesity should be treated as mediators. However, since it cannot be ruled out that they also impact socioeconomic deprivation, determined in this study based on the place where people live, the authors decided to not perform a formal mediation analysis, but only present adjusted and unadjusted analyses. Although there are limitations to this approach, the authors quite convincingly showed that socioeconomic deprivation influenced treatment response beyond traditional risk factors: adjusted results remained mostly unchanged when adjusting for common baseline risk factors.

A next step would be to identify potential areas of intervention, to reduce the observed inequity in treatment outcomes for socioeconomically deprived patients. Based on the results of the study, a focus on traditional risk factors, such as BMI and smoking, seems insufficient. An interesting observation, although not the main aim of this study, is that the reduced response in DAS28 seems more driven by tender joint counts (1.2 units higher in most *vs* least deprived) than by swollen joint counts (0.5 units higher in most *vs* least deprived). This could be related to comorbidities, but it may also suggest a difference in the perceived benefit of patients, and perhaps also of physicians. Whether interventions can be identified that can improve this perceived benefit remains a subject to further study. Other potential areas of intervention to be explored, suggested by the authors, are lower levels of education and health literacy, biases of healthcare providers and institutions, physical

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access to specialized rheumatology care and financial implications of care (e.g. out-of-pocket payments).

A first step towards the identification of potential areas of intervention could be to compare hospitals and patients. Are there hospitals in which the relationship between socioeconomic deprivation and treatment outcomes is less strong? Can we identify which patients have the largest risk of a large impact of socioeconomic deprivation on treatment outcomes? Such analyses could be performed with currently available data.

Secondly, a broader implementation of (standardized) measures of social determinants of health, such as income, employment, living environment and education, will help clinicians and researchers in rheumatology to systematically identify the socioeconomic drivers of a low treatment response. Recently suggested frameworks such as the PROGRESS (PROGnosis RESearch Strategy) framework could serve as a starting point for such an effort, and may drive further research in this area [1].

Lastly, the contribution of a representative panel of patient partners seems indispensable to identify which aspects of inequity in treatment outcomes are most relevant for patients and to suggest interventions to improve disease outcomes, beyond anti-rheumatic treatment alone.

In conclusion, the authors have made an important contribution towards the identification of considerable inequity in treatment outcomes in RA patients starting TNFi. Whether these findings can be generalized to other (rheumatological) diseases and other treatment steps in RA remains to be determined. For now, healthcare providers should be aware of this problem, and try to minimize the effects of inequity in individual patients, for example by proper education of patients about their disease and treatment. A further focus of research on inequity aspects, and mainly potential (areas of) intervention, in close collaboration with patient partners, seems to be the way forward.

Data availability

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