CATEGORISING PATIENTS WITH RHEUMATOID ARTHRITIS USING TRAJECTORIES OF DISEASE ACTIVITY SCORE IN HUNGARY

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Introduction

Rheumatoid arthritis (RA) is a progressive, chronic, autoimmune disease, associated with polyarticular inflammation. Substantial proportion of patients with RA experience inflammatory pain which can entail joint swelling and also deformation of the inflamed area. A study of early RA patients identified using growth-based DAS28 trajectory modelling five mutually exclusive groups where these groups differed in the degree of radiographic progression, improvements of physical function and quality of life measures [1]. According to published data RA affects 0.5-1% of the adult population in industrialised countries. In Hungary approximately 50,000 people are involved in the disease [2]. The objective of the study was to categorise trajectories of disease activity in response to treatment to a new biologic DMARD measured by DAS28 score of bDMARD-naive RA patients and to analyse whether these groups differ in demographic, disease-, treatment-related and cost variables.

Methods

Data source and study period: The retrospective analysis used patient-level healthcare utilization data from the National Health Insurance Fund of Hungary. The database contains all reimbursed health care services, demographic data on age, gender, date and location of birth/death and most importantly patient ID, type/date/place of service, International Classification of Diseases (ICD-10 codes) and International Classification of Health Interventions (ICH) codes for in- and outpatient care or imaging technics. The actual results of laboratory tests, examinations or operations are not directly available. The study period spanned five years from 09.01.2012 to 12.31.2016. Study population: The study population included those RA patients, who started their first bDMARD treatment during the study period, had at least two years of follow-up and had DAS28 measurements in every three month (Figure 1).

By using trajectories clustering method the following 5 unique groups were detected (Figure 2):

- S-MDA: Slow improvement to moderate disease activity
- S-LDA: Slow improvement to low disease activity
- R-MDA: Rapid improvement to moderate disease activity
- R-LDA: Rapid improvement to low disease activity
- R-REM: Rapid improvement to remission

Comparing baseline characteristics:

- The proportion of female patients was highest (91.0%) in the S-LDA group and lowest (77.2%) in the R-REM group, but there was no significant difference between the proportions.
- There was no difference between the groups in the average age, and the median time elapsed between the RA diagnosis and start of the first bDMARD therapy.

Comparing treatment effectiveness and costs:

- Patients in the R-REM group achieved the highest remission rate (92.7%), while patients in the S-MDA group achieved the lowest remission rate (6.4%) within six months from the start of the first bDMARD therapy.
- Patients with slow disease activity score improvement had more knee and hip surgery in the first two years.
- The average healthcare cost was higher in every quarter year in the S-MDA and R-MDA groups relative to the S-LDA and R-LDA, R-REM groups (Table 1).

Results

Table 1: Characteristics of the trajectory groups (Using Pearson’s Chi-squared test, t-test and Mood’s median test)

<table>
<thead>
<tr>
<th></th>
<th>S-MDA</th>
<th>S-LDA</th>
<th>R-MDA</th>
<th>R-LDA</th>
<th>R-REM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female patients (%)</td>
<td>91.0%</td>
<td>84.1%</td>
<td>87.5%</td>
<td>86.0%</td>
<td>77.2%</td>
</tr>
<tr>
<td>Age, mean(sd)</td>
<td>52.46</td>
<td>49.95</td>
<td>52.28</td>
<td>51.96</td>
<td>50.84</td>
</tr>
<tr>
<td>Time between diagnosis and first bDMARD treatment, median (years)</td>
<td>3.36</td>
<td>3.82</td>
<td>4.76</td>
<td>4.55</td>
<td>5.26</td>
</tr>
<tr>
<td>Methotrexate combination therapy (%)</td>
<td>64.1%</td>
<td>39.7%</td>
<td>63.2%</td>
<td>60.4%</td>
<td>66.7%</td>
</tr>
<tr>
<td>Achieving remission (DAS28 ≤ 2.6) within 6 months (%)</td>
<td>46.4%</td>
<td>23.8%</td>
<td>32.2%</td>
<td>62.8%</td>
<td>92.7%</td>
</tr>
<tr>
<td>Total healthcare costs in the first two years, median (€)</td>
<td>619 €</td>
<td>377 €</td>
<td>332 €</td>
<td>255 €</td>
<td>301 €</td>
</tr>
<tr>
<td>Knee and hip surgery within the two years (%)</td>
<td>9.0%</td>
<td>12.2%</td>
<td>1.3%</td>
<td>1.8%</td>
<td>0.8%</td>
</tr>
</tbody>
</table>

Conclusions

The significance of the measured differences between the groups are not clear yet. More extensive studies are needed to identify those factors at baseline that determine which trajectory the patient will follow during treatments.

References

Rheumatoid arthritis trajectories explain variable radiographic, function and quality of life outcomes in the Canadian Early Arthritis Cohort (CATCH); Plüs One, 10 (2015), Article e013527

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