

# The cost-effectiveness of biologic treatment in rheumatoid arthritis in Estonia

## Summary

**Objectives:** To evaluate the current use of disease-modifying antirheumatic drugs (DMARDs) and assess the cost-effectiveness of biologic DMARDs (bDMARDs) in rheumatoid arthritis (RA) patients with active inflammation in Estonia.

**Methods:** Literature search for evidence of cost-effectiveness for bDMARDs was performed in the PubMed database in January 2016. For cost-effectiveness of bDMARDs vs synthetic DMARDs (sDMARDs) 26 studies and for cost-effectiveness of early bDMARDs vs later bDMARDs 3 studies met the predefined selection criteria. Cost-effectiveness analysis was performed from a social perspective. The data about DMARD usage, bDMARD effectiveness and treatment duration were obtained from East Tallinn Central Hospital, and the estimates of health related quality of life and sDMARD effectiveness were based on scientific literature. The health care utilization claims data and prescription drug use were obtained from the Estonian Health Insurance Fund for all bDMARD patients in 2005-2014. The loss of productivity was estimated based on literature. A microsimulation model was used to assess the cost-effectiveness of standard practice in RA biologic treatment versus synthetic treatment, and early onset biologic treatment versus standard practice. The model evaluated differences in lifetime costs and quality-adjusted life-years (QALYs), using incremental cost-effectiveness ratios (ICER). Costs and outcomes were discounted at the annual rate of 5%.

**Results:** The standard RA treatment in Estonia included 3.4 synthetic DMARDs with an average treatment duration of 3.2 years, followed by bDMARDs. As the data for dDMARD use was incomplete (most patients were on therapy and had not completed the regimen) it was assumed that standard RA treatment involves up to 4 bDMARDs. Overall, 303 RA patients were allocated to biologic treatment in 2014 in Estonia, that accounts for approximately 30-50% of all RA patients in need of bDMARD treatment in Estonia. Our results demonstrated that the early onset biologic treatment (after 1 or 2 sDMARDs) will shorten the duration of synthetic treatment by 1.5-2.3 years. Compared to synthetic treatment, the patient gain with a standard bDMARD use was 1.44 QALY, at the cost of €46,000 per QALY gained. Compared to standard bDMARD use, the early bDMARD treatment resulted in a small QALY gain of 0.1-0.2 QALY per patient, at the cost of €66,000-67,000 per QALY. In a sensitivity analysis, the ICER ranged from €34,000 to €64,000 for the comparison of standard biologic to synthetic treatment, and from €47,000 to €107,000 for the comparison of early biologic treatment to standard biologic treatment. Progression of patient health state on biologic treatment had the largest impact on results. The extended use of biosimilars in the coming years will enhance the treatment options for a greater proportion of RA patients.

**Conclusions:** Standard biologic treatment is cost-effective compared to synthetic treatment in patients with RA in Estonia. The QALY gain with an early onset bDMARD therapy vs standard bDMARD use is small.

**Citation:** Alloja J, Jürisson M, Otsa K, Tälli S, Kiivet R-A. *Reumatoidartriidi bioloogilise ravi kulutõhusus Eestis*. Tartu: Tartu Ülikooli tervishoiu instituut; 2015.