

The cost-effectiveness of diabetic retinopathy screening in Estonia

Summary

Objectives: To evaluate the cost-effectiveness of organized diabetic retinopathy (DR) screening programme in Estonia.

Methodology: A literature review was conducted in order to describe the screening programmes and guidelines for the management of DR elsewhere in the world and to gather evidence on the effectiveness and cost-effectiveness of early detection of DR. A Markov cohort model was developed to evaluate the cost-effectiveness of organized screening programme compared to current opportunistic screening of type 2 diabetes (T2D) patients. A hypothetical cohort of 6000 T2D patients aged 50 was followed for 50 years. Data for disease transition probabilities and quality of life estimates was obtained from published literature. The costs were calculated based on Estonian data. Costs and effects were discounted using an annual discount rate of 5%. The model evaluated the differences in costs and quality-adjusted life-years (QALYs). The incremental cost-effectiveness ratio (ICER) was calculated comparing DR screening to no screening scenario. Additionally, a 5-year budget-impact analysis of organised DR screening programme from the healthcare payers' perspective was carried out. It was assumed that the organised screening programme would be gradually introduced and newly diagnosed diabetes patients would enter the programme each year.

Results: The analysis showed that screening all T2D patients for DR would yield in 0.003 extra QALYs per person eligible for screening. The additional per person screening and treatment cost would be €118.12. In the base-case scenario the ICER of DR screening compared to no screening was €37,509 per QALY gained. In the sensitivity analysis it ranged between €15,077–43,600 per QALY gained. The result was most influenced by the decrease in background DR progression probability and health-related quality of life estimates. Budget impact analysis showed that the annual expenditure on DR screening, related diagnostics and treatment would increase by €117,810 in the first year up to €416,157 in the fifth year compared to current opportunistic testing.

Conclusions: In Estonia, no formal cost-effectiveness threshold has been established to determine whether an intervention is cost-effective or not. Based on the results of current analysis, DR screening can be considered cost-effective at a willingness-to-pay threshold of €40,000 per QALY gained. Assuming that screening has a beneficial effect on T2D medication adherence and hence reduces disease progression probability from background DR to preproliferative DR, it can be considered cost-effective even at a willingness-to-pay threshold of €16,000 per QALY gained. However, considering that DR screening enables to detect a diabetes complication instead of preventing it, this may not be the most effective intervention in diabetes management. Rather, more attention should be paid to T2D medication adherence as good glycemic control may prevent and delay long term micro- and macrovascular complications such as DR.

Citation: Võrno T, Pruks LL, Jürgens J, Kiivet RA. *Organiseeritud sõeluuring diabeetilise silmakahjustuse varaseks diagnoosimiseks Eestis*. Tartu: Tartu Ülikooli peremeditsiini ja rahvatervishoiu instituut; 2019.