

Non-invasive prenatal testing for all pregnant women in Estonia

Summary

Background: Non-invasive prenatal testing (NIPT) is a highly effective prenatal screening method for chromosomal aberrations. Similarly to many other countries, NIPT is currently publicly reimbursed only contingently in Estonia, i.e. to high-risk pregnant women, based on a first-tier combined screening. Universal NIPT, i.e. offering NIPT to all pregnant women, may improve the detection of chromosomal aberrations and decrease the false positive rate but at the increased cost of prenatal screening.

Objective: To estimate the cost-effectiveness and budget impact of universal NIPT compared to current contingent NIPT in Estonia.

Methods: A systematic literature search was performed in PubMed to identify relevant studies on diagnostic accuracy and cost-effectiveness of universal NIPT. A systematic review comparing the diagnostic accuracy of NIPT in only high-risk pregnant women and all pregnant women was conducted, as well as a review on the cost-effectiveness of universal NIPT. A Markov cohort model and a budget impact model were constructed to estimate the cost-effectiveness and budgetary effects of universal NIPT compared to contingent NIPT in Estonia.

Results: Based on the systematic review of 11 meta-analyses and other studies, the diagnostic performance of NIPT is similar in universal and contingent settings.

Twenty-one cost-effectiveness studies comparing universal and contingent NIPT were identified. Most studies measured health gain as additionally detected chromosomal aberrations. In these studies, the incremental cost-effectiveness ratio varied between 88,000 and 6,625,000 euros. Unfortunately, no agreed-upon cost-effectiveness threshold exists for incremental cost per additionally detected case. Only two studies measured health gain in quality-adjusted life-years; in both, universal NIPT was not cost-effective.

Based on cost-effectiveness analysis, universal NIPT would increase chromosomal aberration detection by 39% (mainly less prevalent aberrations not screened currently) and decrease false positive results by 82% compared to contingent NIPT. The incremental cost-effectiveness ratios were 85,000 and 92,000 euros per additionally detected case and per added quality-adjusted life-year, respectively. Using a cost-effectiveness threshold of 40,000 euros per added quality-adjusted life-year, universal NIPT is not cost-effective in Estonia compared to contingent NIPT. Providing NIPT to all pregnant women would cost an additional 2,8–2,9 million euros annually for the Estonian Health Insurance Fund compared to current prenatal screening.

Conclusions: Although universal NIPT is more effective in detecting chromosomal aberrations and reducing false positive results, the strategy is not cost-effective in Estonia compared to contingent NIPT.

Citation: Alloja J, Nohrin LC, Hanson E, Juus E, Jürisson M. TTH75 Loote mitteinvasiivse kromosoomhaiguste sõeluuringu rakendamise kõikidele rasedatele. Tartu: Tartu Ülikooli peremeditsiini ja rahvatervishoiu instituut; 2024.