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Ventricular Assist Device Efficacy and Cost-Effectiveness in Advanced Stage Heart Failure

Summary

Objectives: The objectives are to provide evidence-based information about the outcomes of internal and external ventricular assist devices efficacy and cost-effectiveness in comparison with heart transplantation and to evaluate the potential cost of these applications.

Methods: A literature review was carried out for evidence of effectiveness and cost-effectiveness. Searches were performed in PubMed, the Cochrane Database of Systematic Reviews and the International Network of Agencies for Health Technology Assessment database. A manual search was done for the ESC Guidelines for the diagnosis and treatment of acute and chronic heart failure 2012 reference list. In PubMed, the search covered abstracts and search terms including „*Heart transplant effectiveness*“ and „*Ventricular Assist Device effectiveness*”. The initial search results included 64 and 74 articles respectively in which 18 met all criteria. Further, an unconstrained search of suitable cost-effectiveness articles and reports was performed by employing the search terms “VAD device”, “Heart transplant” and “Cost effectiveness”. The alternative search yielded 421 articles, from which 7 articles met the all criteria.

Results: In clinical trials of VAD implantation, one-year and two-year survival of 70-85% and 60-70% has been reported. Moreover, with properly selected patients, the life years gained (LYG) constitute 2-6 years. The incremental cost of additional quality-adjusted life year (QALY) varies according to studies from 100 000 to 400 000 euros which is at the same magnitude of heart transplantation. The large variation of the results can be attributed to the differences in how much and what types of costs are included in the treatment process. Hence the cost-effectiveness analysis should be performed based on country-specific information on treatment costs.

Conclusions: VAD-implantation and heart transplantation are indeed the most effective therapies in the treatment of advanced-stage heart failure, but both methods exhibit problems and issues while implemented in Estonia. VAD equipment is very expensive, but there is readiness by Estonian doctors to start installations if they become available. VAD devices can be installed as a final therapeutic measure, as well as a bridge to transplantation. For heart transplantation, there are yet more obstacles related to legislation and the inability of hospitals to have a 24/7 system to ensure preparedness for performing heart transplantation. There are opportunities to start a cross-country co-operation (particularly with Finland) for both VAD installation and for heart transplantation. However, in that case the quality of care could suffer and the treatment costs are less predictable and manageable.

Reference: Paat-Ahi G, Elmet M, Ruusalepp A, Kiivet R-A. Südametööd toetava seadme efektiivsus ja kulutõhusus kaugelearenenud südamepuudulikkuse korral. Tartu: Tartu Ülikooli tervishoiu instituut; 2012.