

Title	Radiofrequency ablation (RFA) versus antiarrhythmic drugs (AADs) for atrial fibrillation (AF) and economic evaluation
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Aim

To assess effectiveness, safety, and cost-effectiveness of RFA compared with AADs for treatment of patient with AF; to conduct local economic evaluation.

Conclusions and results

High level of retrievable evidence:

Effectiveness

RFA versus AADs increased recurrence-free survival rate and reduced recurrence rate of atrial tachyarrhythmia or atrial arrhythmias, reduced the need for cardioversion, and improved quality of life.

Safety

RFA versus AADs found no differences on all-cause mortality and stroke/TIA; complication for RFA - cardiac tamponade and pulmonary vein stenosis; major adverse drug reaction/toxicity - amiodarone-related dysthyroidism; US FDA approval.

Cost /cost-effectiveness

RFA as a second-line therapy was cost-effective for treatment of drug refractory AF in US and UK while as a first-line therapy was cost-effective for younger patients (\leq 50 years) in Denmark, Finland, Germany and Sweden.

Organizational

RFA was superior to AADs in reducing cardiac-related hospitalisation and rehospitalisation.

Local economic evaluation

Incremental cost-effectiveness ratio (ICER) was RM 56,825.41 per QALY gained; considered as a cost-effective strategy by WHO (1-3 GDP per capita) but slightly higher by Malaysia threshold (\leq 1 GDP per capita). However, from sensitivity analysis, reducing the cost of RFA by 20% or 50% from current cost improved the ICER to RM 39,550.47 and RM 13,638.08 per QALY gained, respectively.

Recommendations

RFA in patient with paroxysmal or/and persistent AF who were unsuccessfully treated with AADs is considered to be cost-effective based on results from sensitivity analysis, and hence, is recommended to be used in specialised cardiac centres in Malaysia. However, RFA should only be conducted by a cardiac electrophysiologist who is credentialed and privileged.

Methods**Part A (Systematic review of literature)**

Electronic databases were searched through the Ovid interface: Ovid MEDLINE® In-process and other Non-indexed citations and Ovid MEDLINE® 1946 to present, EBM Reviews - Cochrane Central Register of Controlled Trials - April 2017, EBM Reviews - Cochrane Database of Systematic Reviews - 2005 to May 2017, EBM Reviews - Health Technology Assessment - 4th Quarter 2016, EBM Reviews - Database of Abstracts of Reviews of Effects - 1st Quarter 2016, EBM Reviews - NHS Economic Evaluation Database 1st Quarter 2016. Searches were also run in PubMed. Google was used to search for additional web-based materials and information. No limits were applied. Additional articles were identified from reviewing the references of retrieved articles. Last search was conducted on 16 August 2017.

Part B (Local economic evaluation)

A decision tree model using TreeAge Pro 2017 software was developed to estimate the costs and utility effects of RFA as second-line treatment of patients with paroxysmal or/and persistent AF who had failed previous treatment with one or more AADs. This population was chosen because consensus guidelines have endorsed ablation in these patients; because ablation appears to potentially yield better results; and because there is a larger body of randomised evidence available from which to derive model parameters. The epidemiological and disease-related data were obtained from local sources of data whenever available or literature review when local data was not available. The ICER was the outcome measure with all costs was presented in Ringgit Malaysia (RM) 2017 values. Deterministic sensitivity analysis was performed as one way sensitivity analysis to determine the parameter uncertainty. The choice of developing decision tree model is based either on the suitability of the timeline or availability of the data, and also based on the literature review of economic evaluation with the agreement from clinical experts.

Further research/reviews required

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