

Title	Microwave tissue ablation for liver tumours
Agency	Adelaide Health Technology Assessment (AHTA), Australia
Reference	Milverton, J., Mittal, R., Parsons J., Schubert C., and Newton, S. (2016). Microwave tissue ablation for primary and secondary liver tumours. MSAC Application 1402, Assessment Report . Commonwealth of Australia, Canberra, ACT.

Aims

To perform a systematic review of the clinical effectiveness and safety evidence and economic analysis for microwave tissue ablation (MTA) to inform a decision for public funding by the Australian Department of Health in patients with 1) unresectable primary liver lesions; 2) unresectable secondary liver lesions, without hepatic spread; and 3) unresectable neuroendocrine liver metastases.

Conclusions and results

Safety

The evidence from two systematic reviews (SRs) in percutaneous ablation found a higher number of overall major adverse events in patients undergoing MTA than radiofrequency ablation (RFA); however, the differences were not statistically significant, and as the rates were low, the differences are unlikely to be of clinical importance.

Two comparative non-randomised studies that examined patients undergoing surgical ablation found higher rates of adverse events than in percutaneous ablation, in both the MTA and RFA groups, and inconsistent findings between studies. Study size and inconsistent reporting made it difficult to draw conclusions from these data.

No conclusions can be drawn about the safety of MTA in Populations 2 and 3 due to limited data. Because of disease complexity and patients generally being more unwell, it is difficult to judge whether the safety profile for MTA in this group would be similar to that for Population 1.

Effectiveness

For percutaneous ablation in Population 1, the SRs were very consistent in their results across the primary outcome measures of local tumour recurrence, complete ablation, overall survival and recurrence-free survival, finding few statistically significant differences between MTA and RFA. The additional comparative studies also provided similar evidence for most outcomes.

Limited data from two studies that reported either rates of recurrence or the relative risk of recurrence, suggested there was no difference between surgical ablation and MTA.

There was some evidence that MTA was superior to RFA for tumour recurrence in patients with more severe cancer. Most studies had historical controls, so the results could also be due to other changes in cancer treatment over that time.

For Population 2, one comparative study found a difference likely to be clinically meaningful, favouring MTA for local tumour recurrence. It also found better overall survival in

years 2 and 5 favouring MTA, although these results were not statistically significant.

There is no evidence to enable any conclusions to be drawn about the effectiveness of MTA in Population 3.

Economic analysis

Key assumptions in the economic analysis are that the pre and postoperative follow-up costs, adverse event rates, and comorbidities and their associated impact on peri and postoperative patient management are all similar across MTA and RFA, and are therefore not included in the analysis. The cost-minimisation analysis found no incremental cost associated with MTA when compared to RFA

Recommendations

Superiority of MTA over RFA is not supported by the evidence. Despite the claims that MTA has quicker ablation time and fewer required sessions, there was little evidence available to support these claims.

On the basis of the non-inferiority conclusion, it was advised that funding for MTA should be consistent with RFA.

Methods

A full systematic review of the evidence pertaining to MTA was performed. Two authors performed the study selection, based on the pre-determined PICO criteria, and a third author conducted a duplicate-cull of the most relevant 10 per cent of the references, to ensure that no studies had been missed. In addition, relevant SRs were peer-reviewed to ensure that no studies were missed. Two authors applied relevant critical appraisal tools based on study types.

Where there was sufficient evidence, meta-analysis was performed. In other instances a narrative synthesis of the evidence was used to report the results.

The comparative evidence did not identify a significant difference in outcomes in Population 1 or 2, and justified the assumption that health outcomes would be equivalent across each arm of the economic evaluation. Therefore, the economic evaluation aimed to use a cost-minimisation approach, to compare the cost of providing MTA with RFA in Population 1, and MTA with or without chemotherapy with RFA with or without chemotherapy in Population 2.

Further research/reviews required

N/A

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