Is tea tree oil effective at eradicating MRSA colonization: a review

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CRD summary
This review assessed the use of tea tree oil for eradicating colonisation with methicillin-resistant Staphylococcus aureus. The authors concluded that there is currently insufficient evidence to support its use. The conclusion reflects the limited evidence available on this topic, although the quality of the review was somewhat weakened by poor reporting of review methods.

Authors’ objectives
To assess the effectiveness of tea tree oil in eradicating colonisation with methicillin-resistant Staphylococcus aureus (MRSA).

Searching
Searches of MEDLINE, EMBASE, CINAHL and AMED (all from inception to April to May 2004) and the Cochrane Library (Issue 2, 2004) were conducted using the reported terms. The reference lists of relevant articles were also screened. Unpublished studies were sought by searching the Internet, which included publication lists of the Tea Tree Oil Research Group and a website for complementary medicine, and by posting a question on the web site discussion boards of the Hospital Infection Society and the Infection Control Nurses Association. The most recent edition of the Journal of Hospital Infection was also searched.

Study selection
Study designs of evaluations included in the review
Randomised controlled trials (RCTs) and systematic reviews of RCTs were eligible for inclusion.

Specific interventions included in the review
Studies that compared topical tea tree oil with usual treatment were eligible for inclusion. Tea tree regimens evaluated in the included studies were 4% oil nasal ointment applied to nares, 5% oil body wash or 10% oil cream to nares and lesions, and 5% oil body wash. Control regimens were 2% mupirocin nasal ointment plus an antiseptic body wash. One study also treated MRSA-infected patients with intravenous vancomycin. The duration of treatment was 5 days in one study and ranged from 1 to 34 days in the other study.

Participants included in the review
Studies of patients colonised with MRSA were eligible for inclusion. Studies of MRSA-infected patients were also included.

Outcomes assessed in the review
Explicit inclusion criteria were not given, although it was clear that studies assessing MRSA eradication were eligible. Eradication was assessed by taking swabs at 2 and 4 days post-treatment.

How were decisions on the relevance of primary studies made?
The authors did not state how the papers were selected for the review, or how many reviewers performed the selection.

Assessment of study quality
Studies were assessed for blinding, concealment of allocation, 80% or more follow-up, intention-to-treat analysis, and equal treatment of groups apart from intervention. Baseline comparability of the treatment groups was also assessed. The authors did not state how many reviewers performed the validity assessment.
Data extraction
The authors did not state how the data were extracted for the review, or how many reviewers performed the data extraction. The number of patients with MRSA eradication were extracted from each study and 95% confidence intervals (CIs) of the absolute risk reduction (ARR) were presented. Data were also extracted from one study that reported a subgroup analysis of nasal clearance. Additional information on one study was obtained from the author.

Methods of synthesis
How were the studies combined?
The studies were combined in a narrative.

How were differences between studies investigated?
Differences between the studies were discussed in the text and additional information tabulated.

Results of the review
Two RCTs (n=266) were included.

Methodological flaws in the studies included small sample sizes, inadequate description of patient characteristics, baseline characteristics not comparable between treatment groups, no details of randomisation, and variation in the duration of treatment between groups (1 study).

No statistically significant difference was shown in MRSA eradication between tea tree oil and mupirocin at 14 days (41% versus 49% with mupirocin; 95% CI of ARR: -0.06, -0.20, P=0.286; based on 236 patients in 1 RCT) or at 4 days (33% versus 13% with mupirocin; 95% CI of ARR: 0.49, -0.12, P=0.235; based on 30 patients in 1 RCT).

One of the RCTs (n=236) found that mupirocin significantly increased nasal clearance compared with tea tree oil (78% versus 47.3%; 95% CI of ARR: 0.15, -0.44, P<0.001; based on the analysis of 150 patients).

Authors' conclusions
There is currently insufficient evidence to support the use of tea tree oil in clinical practice for the eradication of MRSA colonisation.

CRD commentary
This review addressed a clear question that was defined in terms of the participants, intervention, outcomes and study design. Several relevant sources were searched and attempts were made to locate unpublished studies, thus reducing the potential for publication bias. The methods used to select studies, assess validity and extract the data were not described, so it is not known whether any efforts were made to reduce reviewer errors and bias. Validity was assessed using defined criteria and the results were reported and discussed.

Adequate information on the included studies was presented. The narrative synthesis of the studies was appropriate given the differences between the studies. The summary of the identified evidence was clearly presented and the conclusions took study quality into account. The authors’ conclusions reflect the limited evidence presented on this topic, but the lack of reporting of review methods limits the quality of the review.

Implications of the review for practice and research
Practice: The authors stated that evidence tends to favour the use of mupirocin-based treatments for eradicating MRSA colonisation in the absence of resistance, so these should remain first-line treatments. They further stated that tea tree oil may have a place as a second-line treatment, especially for patients with no nasal colonisation.

Research: The authors stated that further controlled trials of tea tree oil are required.
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