TITLE: Humidified Continuous Positive Airway Pressure Devices for Adults with Obstructive Sleep Apnea: Clinical Effectiveness and Cost-Effectiveness

DATE: 12 December 2016

RESEARCH QUESTIONS

1. What is the comparative clinical effectiveness of humidified continuous positive airway pressure (CPAP) versus non-humidified CPAP for adult patients with obstructive sleep apnea?

2. What is the cost-effectiveness of humidified CPAP for adult patients with obstructive sleep apnea?

KEY FINDINGS

One health technology assessment, six randomized controlled trials, and one non-randomized study were identified regarding the comparative clinical effectiveness of humidified CPAP versus non-humidified CPAP for adult patients with obstructive sleep apnea.

METHODS

A limited literature search was conducted on key resources including PubMed, The Cochrane Library, University of York Centre for Reviews and Dissemination (CRD) databases, Canadian and major international health technology agencies, as well as a focused Internet search. No filters were applied to limit the retrieval by study type. Where possible, retrieval was limited to the human population. The search was also limited to English language documents published between January 1, 2011 and November 28, 2016. Internet links were provided, where available.

The summary of findings was prepared from the abstracts of the relevant information. Please note that data contained in abstracts may not always be an accurate reflection of the data contained within the full article.
SELECTION CRITERIA

One reviewer screened citations and selected studies based on the inclusion criteria presented in Table 1.

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<th>Table 1: Selection Criteria</th>
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<td><strong>Population</strong></td>
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<td><strong>Study Designs</strong></td>
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CPAP = continuous positive airway pressure.

RESULTS

Rapid Response reports are organized so that the higher quality evidence is presented first. Therefore, health technology assessment reports, systematic reviews, and meta-analyses are presented first. These are followed by randomized controlled trials, non-randomized studies, and economic evaluations.

One health technology assessment, six randomized controlled trials, and one non-randomized study were identified regarding the comparative clinical effectiveness of humidified CPAP versus non-humidified CPAP for adult patients with obstructive sleep apnea. No relevant systematic reviews, meta-analyses, or economic analyses were identified.

Additional articles are available in the appendix.

OVERALL SUMMARY OF FINDINGS

One health technology assessment\(^1\) was identified. The authors assessed five clinical trials and determined that there was not enough evidence to determine whether there was a difference between humidified and non-humidified continuous positive airway pressure (CPAP) in regards to compliance or clinical outcomes.\(^1\)

Five randomized controlled trials\(^2-6\) (RCTs) were identified. Heated humidified CPAP was compared with non-humidified CPAP in cool sleeping environments.\(^2\) A significant reduction in upper airway symptoms was reported in the humidified CPAP group.\(^2\) No significant differences were reported between the two groups in apnea hypopnea index (AHI) reduction, optimal CPAP pressure, or leak.\(^2\) In one RCT,\(^3\) patients with obstructive sleep apnea (OSA) with nasopharyngeal symptoms were randomized to receive heated humidified CPAP or non-humidified CPAP for four weeks and then crossed over to the other treatment.\(^3\) There was a non-significant improvement in the average hours of use with heated humidified CPAP and adherence on days of use. An improved quality of life score and significant reduction in dry or sore throat symptoms were reported in the humidified CPAP group.\(^3\) A second RCT\(^4\) examining patients with OSA with nasopharyngeal symptoms found nasopharyngeal symptoms were improved in the heated humidified CPAP group. Sleep improvement, willingness to use CPAP, leak, AHI reduction, and optimal CPAP pressure were not significantly different between
groups. In another study, patients with OSA were randomized to receive heated humidified CPAP or CPAP with sham-heated humidification for three weeks and then crossed over to receive the other treatment for three weeks. Nasal symptoms were decreased with heated humidified CPAP. When heated humidified CPAP was used by patients at home in another RCT, a significant decrease in mouth dryness was observed in the heated humidified CPAP group during the first two nights. Waking up to wetness on the face had also increased.

One non-randomized study followed patients with OSA for one year. The authors found that mouth dryness score decreased significantly in patients who received either humidified or non-humidified CPAP. The use of humidification prevented the aggravations of runny nose and significantly improved nasal stuffiness.

No relevant economic evaluations were identified.
REFERENCES SUMMARIZED

Health Technology Assessments

   See: Comparison of Humidification in CPAP, page ES-8

Systematic Reviews and Meta-analyses
No literature identified.

Randomized Controlled Trials

   PubMed: PM27193744

   PubMed: PM27220350

   PubMed: PM22311554

   PubMed: PM20595158

   PubMed: PM20503074

Non-Randomized Studies

   PubMed: PM26732141
Economic Evaluations
No literature identified.

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APPENDIX – FURTHER INFORMATION:

Randomized Controlled Trials – Alternate Comparator


Additional References