TITLE: Nitrous Oxide and Oxygen Blending for Pain Management during Labour: Clinical Effectiveness, Safety, and Guidelines

DATE: 21 July 2010

RESEARCH QUESTIONS:

1. What is the clinical effectiveness of different percentage blends of inhaled nitrous oxide and oxygen for pain management during labour?

2. What are the safety considerations associated with the use of inhaled nitrous oxide and oxygen blends for pain management during labour?

3. What are the evidence-based guidelines for the use of inhaled nitrous oxide and oxygen blends for pain management during labour?

METHODS:

A limited literature search was conducted on key health technology assessment resources, including Medline, PubMed, the Cochrane Library (Issue 6, 2010), University of York Centre for Reviews and Dissemination (CRD) databases, ECRI (Health Devices Gold), EuroScan, international health technology agencies, and a focused Internet search. The search was limited to English language articles published between January 1, 2005 and July 8, 2010. No search filters were applied to limit the retrieval by study type. 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.

RESULTS:

HTIS 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 evidence-based guidelines.

One systematic review, five randomized controlled trials, and two evidence-based guidelines were identified pertaining to inhaled nitrous oxide and oxygen blends for pain management during labour. No relevant health technology assessment reports or non-randomized studies were identified. Additional information that may be of interest has been included in the appendix.

OVERALL SUMMARY OF FINDINGS:

Overall, the identified evidence indicates that nitrous oxide (N₂O), at a concentration of 50% oxygen and 50% N₂O, provides some pain relief for women in labour but is less effective than sevoflurane, remifentanil, and spinal epidural analgesia and is not considered to be a “potent” analgesic. Forty per cent N₂O has been shown to reduce anxiety in women undergoing cesarean section, but resulted in similar pain scores when compared to oxygen alone.

Although N₂O administration may result in higher volume of bleeding in women undergoing cesarean section and can result in higher rates of side effects, all of the identified studies found it to be safe and it did not result in significant adverse reactions. The only study to examine differing concentrations of nitrous oxide (from 50% to 80%) found that increased N₂O percentages had no effect on labour duration, vomiting and nausea, or on one-minute Apgar scores, but did result in increased unconsciousness.

The identified guidelines indicate that nitrous oxide has some efficacy in reducing pain during labour, is safe, and should be available to women in labour, but provide recommendations only on 50:50 concentrations.
REFERENCES SUMMARIZED:

Health technology assessments
No literature identified.

Systematic reviews and meta-analyses

Randomized controlled trials

Non-randomized studies
No literature identified.

Guidelines and recommendations

See page xxiii
See: Inhalational analgesia

PREPARED BY:
Health Technology Inquiry Service
Email: htis@cadth.ca
Tel: 1-866-898-8439
APPENDIX – FURTHER INFORMATION:

Guidelines and recommendations


Review articles

Note: The full text of this article may not be available in English

Additional references

Note: The full text of this article may not be available in English