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Carbon footprint of nitrous oxide (“laughing gas”) should be explained to patients, anaesthetists say

The widespread use of nitrous oxide for pain relief during childbirth in Australia and New Zealand should be carefully reconsidered because of its environmental impact according to the latest medical publication released by the Australian and New Zealand College of Anaesthetists (ANZCA).

Often referred to as “laughing gas” nitrous oxide (N₂O) has been used in Australia since the 1950s to manage labour pain and is one of the oldest anaesthetic agents still in use.

In the latest edition of *Australasian Anaesthesia*, a peer-reviewed reference for ANZCA's 7500 specialist anaesthetists and 500 specialist pain medicine physicians published every two years, Melbourne (Western Health) anaesthetists Dr Alice Gynther and Associate Professor Forbes McGain, and UK anaesthetist Dr Fiona Pearson say nitrous oxide is a potent greenhouse gas with much higher carbon gas emissions than other anaesthetic alternatives. It also contributes to ozone layer depletion.

According to carbon dioxide emission figures compiled by the authors, intermittent use of nitrous oxide for four hours during labour creates the same carbon footprint as driving almost 1500 kilometres – compared to the six kilometre carbon impact of an epidural.

In their chapter “Nitrous oxide use on the labour ward” the anaesthetists suggest that providing information about the carbon emissions of nitrous oxide during ante-natal classes was one way patients could be better informed about its impact on the environment.

“In order to support women’s autonomy and help them make informed choices regarding their labour analgesia, we have a duty to explain the risks and benefits of the different analgesic options. As climate change is a threat to public health, the carbon footprint of N₂O is arguably a ‘risk’ worthy of inclusion in such discussions.”

Alternative analgesics (for example, epidural, a ‘pain button’ and morphine) as well as techniques for women who prefer less ‘medical’ interventions such as transcutaneous electric nerve stimulators (TENS), hypnobirthing and massage, were also offered by the authors as potential options with lower carbon impact.

A literature review conducted by the authors examined the effect of nitrous oxide for pain relief compared to epidural anaesthesia and other analgesic drugs: “In summary, the analgesic effect of N₂O appears greater than placebo and pethidine but inferior to volatile anaesthetics, remifentanyl PCA and epidural analgesia. In some studies, it is associated with a positive birth experience/satisfaction,” the authors write. “Randomised controlled trials have found no difference in analgesic efficacy between N₂O and TENS.”

“Ensuring that midwifery, obstetric and anaesthetic staff are aware of the environmental impact of N₂O is crucial. Raising awareness of nitrous oxide’s greenhouse gas effects may change the way it is used,” the authors write.

Figures supplied by the authors from the labour ward at Melbourne’s Joan Kirner Women’s and Children’s at Sunshine Hospital in 2020 revealed that 62 per cent of women used nitrous oxide and 40 per cent of these also received epidural analgesia – figures in line with the national average.

In an international comparison the authors found that 84 per cent of climate emissions from anaesthetic gases in Sweden were caused by nitrous oxide. After 2009 when nitrous oxide destruction systems were introduced in hospitals there (mobile units cost \$A46,000) the medical gas carbon footprint was cut by half.

“Nitrous oxide is used widely for the management of labour pain in Australia and New Zealand. While the medical literature acknowledges the lack of good quality evidence for its effectiveness, a common theme is that it is safe and convenient, and its use should therefore be continued. While it may be innocuous for the pregnant woman and unborn baby, that is certainly not the case for the environment.”

“By educating medical staff and pregnant women about the carbon impact of N₂O, ensuring that it is delivered and used as efficiently as possible and considering the use of more carbon-friendly alternatives, we can reduce greenhouse gas emissions from the labour ward and help to mitigate the effects of climate change.”

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