Nitrous Oxide: A Global Toxicological Effect to Consider

To the Editor—The recent review article by Sanders et al.1 was informative and comprehensive, with the exception of one important toxicological detail. Nitrous oxide is known to have a significant global climatologic impact as a naturally occurring greenhouse gas. After carbon dioxide and methane, nitrous oxide is the third most climatologically significant greenhouse gas. Greenhouse gases act like a warming blanket in the troposphere and prevent radiative cooling. Nitrous oxide is a particularly potent greenhouse gas with 300 times the global warming potential of carbon dioxide over 100 yr, according to the Intergovernmental Panel on Climate Change.2 It seems prudent to include the climatologic effects of nitrous oxide as a biologic effect of the gas. The climatologic effect and global warming potential of all halogenated anesthetic agents was addressed in a 1989 article, in the journal Nature, by Brown and colleagues. They concluded that the relatively short atmospheric lifetime of these agents reduces their ozone-depleting impact and global warming potential significantly, relative to other chlorofluorocarbons.3 Desflurane has a global warming potential 1,341 times more potent than that of carbon dioxide when considered over a 100-yr period.4 Langbein et al. reported that the atmospheric effects of all the halogenated anesthetics combined produce a relative contribution to global warming of .03% 5. Nitrous oxide, in contrast, has a long atmospheric lifetime of approximately 120 yr. The vast majority of atmospheric nitrous oxide from human activity is released from combustion and agricultural soils, particularly after the use of nitrogenous fertilizers. Although anesthetic nitrous oxide is believed to constitute a proportionally small amount of all atmospheric nitrous oxide by volume, the exact relative global warming contribution from all medical and dental anesthetic use remains to be studied.

The true value of this study lies in the detection of impedance changes that signify intraneural needle placement. Depending on the species, the noted change in impedance may be an increase or a decrease, and it may even be transient in nature. As it is said in a famous Chinese proverb attributed to Deng Xiaoping for his pragmatic policies, “It doesn’t matter if a cat is black or white; as long as it can catch mice, it’s a good cat.”

Ban C. H. Tsui, M.D., M.S.C., F.R.C.P.(C.),† Derek Dillane, M.B., B.Ch., ‡ University of Alberta Hospital, Edmonton, Alberta, Canada.
btsui@ualberta.ca

References

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