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Beyond the Mask: Advocating Eco-Conscious Anaesthesia Practices

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Running Head: *Green Anaesthesia Practices*

Abstract: ***Global warming, leading to climate change, has emerged as a critical environmental issue, significantly impacting human health through heat strokes, flood damage, and food cycle disruptions. The healthcare industry, responsible for 5 of global greenhouse gas emissions, heavily contributes to this problem, particularly through the field of Anaesthesiology. Anaesthetic agents like Sevoflurane, Desflurane, and Isoflurane, used in general anaesthesia, have high Global Warming Potential GWP and are released into the atmosphere, exacerbating climate change. To mitigate this impact, the adoption of eco-conscious practices in anaesthesia is essential. These include favouring regional anaesthesia, minimizing Nitrous Oxide use, employing low fresh gas flows, utilizing anaesthesia depth monitors, and implementing efficient gas scavenging systems. Furthermore, developing renewable energy sources and biodegradable medical equipment can significantly enhance environmental sustainability. By integrating these practices, anaesthesiologists can play a pivotal role in reducing the ecological footprint of anaesthesia and ensuring a healthier, sustainable future.***

Keywords: global warming, climate change, anaesthesiology, greenhouse gases, eco-friendly anaesthesia

1. Introduction

Global warming leading to climate change has been a serious environmental issue in the past few decades. With an increase in the average temperature of the earth's atmosphere, there is a change in various environmental factors. It can adversely affect human health through frequent changes in weather conditions leading to heat stroke, damage due to floods and disruption in the food cycle. (1)

Why do we need a Green Anaesthesia Initiative?

The healthcare industry which has evolved exponentially over the past few decades, is responsible for 5% of the global greenhouse gas emissions. (2) The field of Anaesthesiology employs Nitrous oxide and various halogenated volatile gasses for administering general anaesthesia and analgesia. Sevoflurane, Desflurane and Isoflurane are the most commonly used volatile anaesthetic agents in recent times. Only less than 5% of these gases administered are metabolised in the body, whereas the remaining is vented through the scavenging systems into the atmosphere. (3) These agents along with Nitrous oxide are potent greenhouse gasses which can lead to the trapping of heat in the atmosphere and contribute to the depletion of the ozone layer. (4) Global Warming Potential (GWP) is one of the indices used to estimate the potential contribution of a greenhouse gas to climate change. Desflurane has the maximum GWP among the modern-day volatile anaesthetic agents. (5) Though these agents are an integral part of the administration of general anaesthesia, there have been many advancements in the field of anaesthesiology which has had a huge positive impact on reducing the contribution to global warming.

What are the Eco-Conscious Goals?

The main goal should be to decrease the ecological burden generated by the administration of anaesthesia. Reducing the carbon footprint and the emission of various volatile anaesthetic agents into the atmosphere can have beneficial outcomes on environmental sustainability.

How can we Achieve these Goals?

A few steps that can help in achieving this goal are:

1) Administration of regional anaesthesia when feasible to decrease the utility of volatile anaesthetic agents.
2) Avoiding the usage of Nitrous Oxide as a carrier gas.
3) Use of low fresh gas flows when volatile anaesthetic agents are administered can limit operation theatre pollution.
4) Use of depth of anaesthesia monitors such as the Bispectral Index to avoid excessive administration of anaesthetic agents.
5) Installation of an efficient gas scavenging system in the operation theatre can reduce the pollution in the operation theatre.
6) Development of renewable sources of energy production, monitoring systems for operation theatre pollution and biodegradable medical equipment are a few areas of research and development.

2. Conclusion

Every individual should make sure our day-to-day practices are eco-friendly in every field. We must create a healthy and sustainable environment for future generations to grow up in. The young budding anaesthesiologists can make a huge difference in making eco-friendly anaesthesia practices an integral part of the present and future of anaesthesia.

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Chandini Kukanti: This author helped in manuscript preparation and literature search
Pharanitharan Natarajan: This author helped in manuscript preparation and literature search

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