Indian Journal of Clinical Anaesthesia 2024;11(4):445–447

Content available at: https://www.ipinnovative.com/open-access-journals

Indian Journal of Clinical Anaesthesia

Journal homepage: www.ijca.in

Editorial

Reducing carbon footprint: Paving the way for sustainable anesthesia

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ARTICLE INFO

Article history:
Received 04-10-2024
Accepted 18-10-2024
Available online 07-11-2024

Ever since the World Health Organization (WHO) declared climate change as the 'single biggest health threat facing humanity', a lot has been and continues to be said (quite reasonably so) about global warming and specifically, regarding the heavy carbon footprint of anesthesia practice.[1,2] Operating theaters (OTs), for instance have off late been in the focus for being a major contributor to the total hospital carbon output, primarily attributable to the sheer volume of the consumables and the energy utilized.[3] On a general note, however, meanwhile some envisage the healthcare's environmental health impact to be ironical, it be rather seen as the healthcare and the environment, interacting at multiple levels and in an equally complicated manner.We, our patient, and the community, at large, living in this environment alike, it becomes imperative to seek every possible opportunity to nurture environmental sustainability, given the pledge to do no harm to the patients. Ahead of just presenting the worrying current facts or scaremongering to suggest an impending global ecological collapse, it would instead be prudent to wrap our heads around mitigating the challenges of providing environment friendly care. Much to the respite, increasing endeavors are being directed towards comprehending environmentally sustainable anesthesia in principle and practicality.[2,3]

Albeit the need to understand that anesthesiologists ought not to be stereotyped as 'gasmen' while detailing a holistic concept like environmental sustainability, let us have a closer look at the much talked about environmental influences of the volatile anesthetics. Volatile anesthetic agents happen to be halogenated fluorocarbons, and hence potent greenhouse gases (GHGs), as quantified by their global warming potential (GWP), a relative measure of the extent of heat a given gas traps in atmosphere when compared to a similar mass of carbon dioxide.[3,4]With a very limited amount of the inhalational agents actively metabolized, the inability to regulate the remaining larger fraction released into the atmosphere compounds the existing problem well beyond the other GHGs, alongside these drugs being deemed as a medical necessity. Nitrous oxide and desflurane captivate peculiar attention in this regard. With the 100-y GWP of desflurane approaching as high as 2540, the much longer atmospheric life span for nitrous oxide poses sizeable concerns despite of a lower 100-y GWP.[4]Nitrous oxide, in addition, depletes the ozone layer which is supposed to shield us from the harmful ultraviolet radiation, wherein the higher concentrations it is used at, owing to its' lower potency, also need to be borne in mind. GHG emissions from the inhalational anesthetics can nonetheless be reduced by meticulously employing low-flow anesthesia in oxygen-air mixtures, minimizing their use as per the feasibility, and resorting to

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https://doi.org/10.18231/j.ijca.2024.083

the use of inhalational agents with lower GWP.[3,4] Advanced scavenging technologies are fortunately being developed, and at the same time, being refined to capture, and destroy the scavenged agents, reducing the detrimental atmospheric effects of inhalational anesthetics, furthermore.[3]

Moreover, regional practices be duly motivated for its' obvious 'green' prospects ('Green'-gional anesthesia).[5] In circumstances mandating general anesthesia administration, total intravenous anesthesia (TIVA) may be promoted as a viable alternative to the use of inhalational agents. Although the amount of inhalational use is curtailed with the alternative of TIVA, the environmental hazards of the plastic waste generated, cannot be undermined. That said, the early literature accruing in this topic tends to favor TIVA, having had accounted for the former environmental issues.[3,4] Even in the larger perspective, finding faults with the alternatives can no longer serve as an excuse to maintain the 'status quo', as it is not necessarily the alternative which is as bad as the attitude to redirect responsibility towards environment. Speaking of responsibility, the global consensus statement from the World Federation of Societies of Anesthesiologists (WFSA) on the principles of environment friendly anesthesia, categorically made it a point to buttress that the utmost responsibility of ensuring patient safety in no ways be compromised in endeavoring for a sustainable perioperative practice.[3] The consensus of the Working Group pertaining to the anesthesia providers leading by example and from the front on the 'green' issues, both on personal and professional grounds, were simultaneously backed by directives such as those seeking a cumulative cohesive combat from the high-, middle-, and low-income countries against the environmental hazards of anesthesia.[3,5,6]

Delving down to the core usage of the equipment, energy, and for that matter, any other relevant resource like drug, water, the 6 R's can pave the path to really going 'green' in the OT. The constellation of (R)efuse, (R)educe, (R)ecycle, (R)euse, (R)ethink, (R)esearch, makes for a thought-provoking, minimalist, conservative, resource-intensive, adaptative, pragmatic, and an accommodating composite approach to sustainability.[6] The contextual role played here by the institutional environmental sustainability committees, in the form of policy designing and the regular audits, can indeed not be overemphasized. In reference as to how a high-quality sustainable healthcare research should materialize, the 'triple bottom line' forms an important concept, constituting environmental, social, and then financial considerations to help furnish meaningful outputs that may be potentially translated into the day-to-day clinical practice.[3,6] Needless to say, factoring in the public voice into the whole agenda of sustainability, can go that extra mile in winning acceptability as a catalyst for this positive change.

All said and done, there is certainly no panacea when it comes to environmental sustainability. From the heavy reliance on the technological optimism to the often-touted recycling as a fix-all, there exist questions galore! While the most see the large part of sustainability being practiced around prioritizing options within the scope of ones' work-field, we firmly believe that it has more to do with a behavioral change at the outset. It is the need of the hour to formally incorporate the environmental sustainability principles into the anesthesia curriculum, training, and even as a part of continuing the professional development.[3] The objective here is to build upon what is called as the 'practical carbon literacy' assisting in comprehending the immediate actionable steps at the frontline. This should be accompanied by an increasing focus on the other pivotal facets of capabilities, opportunities, and motivation to eventually strengthen the links between the policy makers, industry, and the community through the comprehension of the ill-effects of climate change and the provision of high-quality evidence on the amelioration of the same.[4,7]

On this long less-known road to environmentally sustainable perioperative care, patience and perseverance is paramount. The smallest of the changes in the right direction are expected to add up significantly, not to however forget the finite resources at hand and the requirement to maximize environmental gains against of the financial and time constraints. Unfortunately, though, it is time that we really do not have and the ethical obligation for every possible action is now! After all, it is neither impossible nor too late! Considering the OTs represent the intersection of various healthcare professionals at one place, the power of engagement works to our advantage, as long as active cooperation is sought and provided unconditionally. We united can strive for a cultural change adopting a 'greener' lifestyle over and above our anesthetic practice.[7]

Centered around meeting the needs of the present without compromising the ability of the future generations to meet their needs, sustainability is a global problem awaiting global solutions. Treading nowhere near calling the other self as a part of the problem if he/she is not a part of the solution, we firmly believe that the existential pessimism can be conquered by a concerted personal, professional, and societal commitment to nature. To conclude, it would be appropriate to cite a befitting Sanskrit shloka: "Mata Bhumi putroham prithivyah" meaning "Earth is my mother; I am her son", and hence I/we can be anything but inconsiderate to our mother Earth…

1. Conflict of Interest

None.

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Cite this article: Magoon R, Choudhary N, Gupta L. Reducing carbon footprint: Paving the way for sustainable anesthesia. *Indian J Clin Anaesth* 2024;11(4):445-447.