International Journal of Psychosocial Rehabilitation, Vol. 24, Issue 01, 2020
ISSN: 1475-7192

AWARENESS OF MEDICAL APPLICATIONS OF OZONATED WATER THERAPY AMONG DENTAL STUDENTS

Nithyanandham Masilamani[1], Dhanraj Ganapathy[2]

Abstract

Ozone (O3) happens to be a triple atomic particle that comprise three oxygen iotas with an atomic load of 47.98 g/mol. Ozone is a thermokinetic coseismal particle which, contingent upon framework conditions like temperature and weight, has a short half-life and breaks down into sub-atomic oxygen (O2) . Ozone is utilized as medication in many conditions .The aim of the study was to assess the awareness of medical applications of ozonated water therapy among dental students.A cross sectional study was done with a self-administered questionnaire with 10 questions circulated among 100 dental students. The questionnaire assessed the awareness about ozone water therapy in medical applications ,their medicinal uses,antinflamatory activity ,mechanism of action and side effects.The responses were recorded and analysed.87% of the respondents were not aware of medical uses of Ozone water therapy .73% were not aware of antinflammatory activity of Ozone water therapy.83 % were not aware of the mechanism of action of Ozone water therapy .85% were not aware of side effects of Ozone water therapy.The awareness about the use of Ozone water therapy in medical applications is very less among dental students.Increased awareness programs and sensitization and continuing dental education programs along with greater importance to the curricular modifications should be incorporated to improve the awareness levels.

Keywords: *Awareness, ozone water therapy, dental students*

Introduction

Ozone (O3) happens to be a triple atomic particle that comprise three oxygen iotas with an atomic load of 47.98 g/mol. Ozone is a thermokinetic coseismal particle which, contingent upon framework conditions like temperature and weight, has a short half-life and breaks down into sub-atomic oxygen (O2) . Ozone is utilized as medication in many conditions (Bocci, 2002; Burns & Thorburn Burns, 1997).This O3/O2 blend displays different consequences for the invulnerable framework, for example, regulating the phagocytic movement of

[1] Tutor, Department of Prosthodontics, Saveetha Dental College and Hospitals, Saveetha Institute of Medical and Technical Sciences, Chennai,India .

[2] Corresponding Author: Professor &Head of Department, Department of Prosthodontics, Saveetha Dental College and Hospitals, Saveetha Institute of Medical and Technical Sciences, Chennai, India,
Email: dhanrajmganapathy@yahoo.co.in

alveolar and peritoneal macrophages . O3 builds the movement of cancer prevention agent proteins including superoxide dismutase (SOD),catalase and glutathione peroxidase, accordingly setting up the host to confront pathophysiological conditions interceded by reactive oxygen species (ROS) (Bocci et al., 2011).

Discoveries of past examinations have demonstrated that delayed inhalation of O3 gas harms the respiratory framework and other organs (Aris et al., 1993; Balmes et al., 1996). A progression of meta-examinations and assessment of geographic and occasional Ozone hazard has given proof to the relationship between O3 gas and mortality rate (Devlin et al., 1991) .As O3 inhalation is joined by perilous symptoms and since O3 is a gaseous state of matter, its advantages are constrained . To build the adequacy and wellbeing of ozone treatment, ozone might be disintegrated in water (Murphy, 2009). This is profitable as ozonated water is simpler to oversee and more secure than ozone gas. In any case, gadgets to create ozonated water, which can absolutely direct the convergence of the disintegrated ozone gas are not savvy. In this manner, ozonated water is not generally used.(Harber et al., 1996;Krishna et al., 1998)

Ozonated water possess antimicrobial effects (Scott et al., 1963). Ozmen et al (1993) reported that ozonated saline was effective as medical aid for treating empirical peritonitis in rat models with several benefits.Hence this study was done with aim to assess the awareness of medical applications of ozonated water therapy among dental students.

Materials and method

A cross sectional study was done with a self-administered questionnaire with 10 questions circulated among 100 dental students. The questionnaire assessed the awareness about ozone water therapy in medical applications ,their medicinal uses,anti inflammatory activity ,mechanism of action and side effects.The responses were recorded and analysed.

Results

92% of the respondents were not aware of medical uses of Ozone water therapy(Fig1) .83% were not aware of anti inflammatory activity of Ozone water therapy (Fig 2).81 % were not aware of the mechanism of action of Ozone water therapy (Fig 3) .84 % were not aware of side effects of Ozone water therapy (Fig 4).

Fig.1:Awareness of medical uses of Ozone water therapy

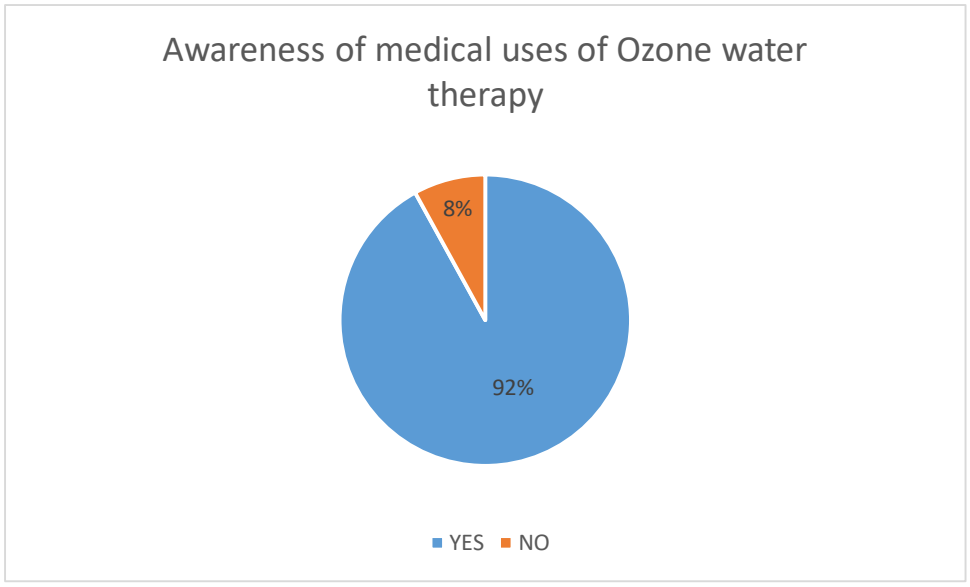


Fig.2:Awareness of anti inflammatory activity of Ozone water therapy

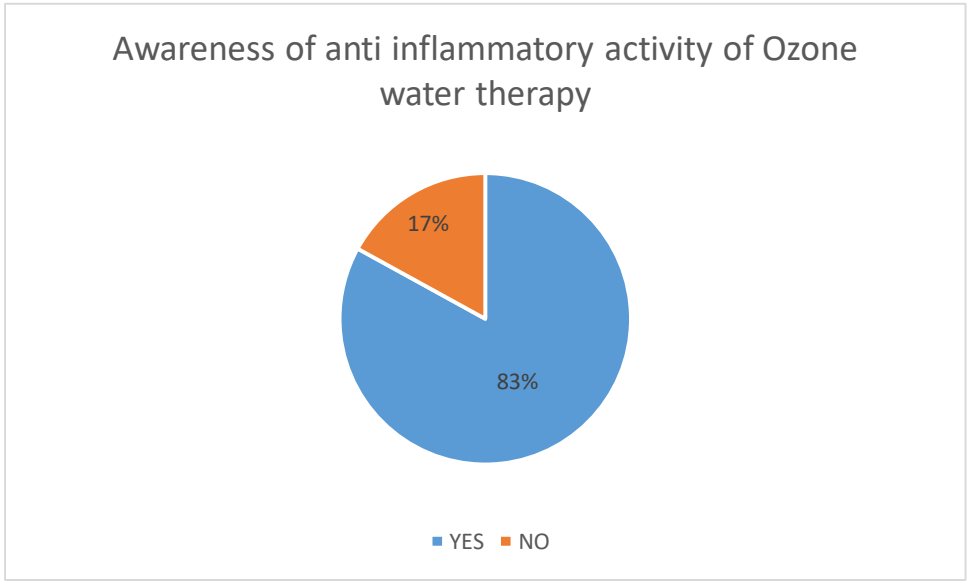


Fig.3:Awareness of mechanism of action of Ozone water therapy

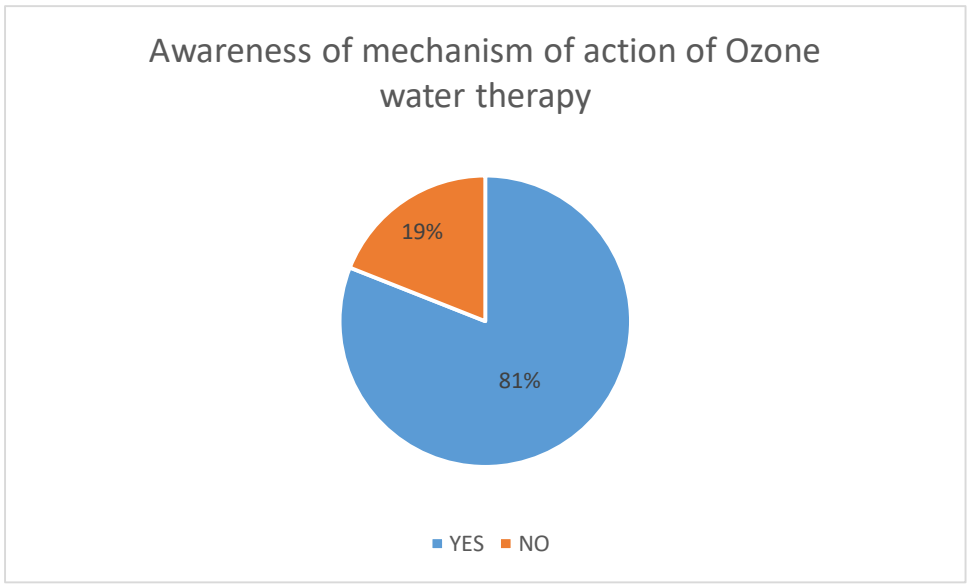
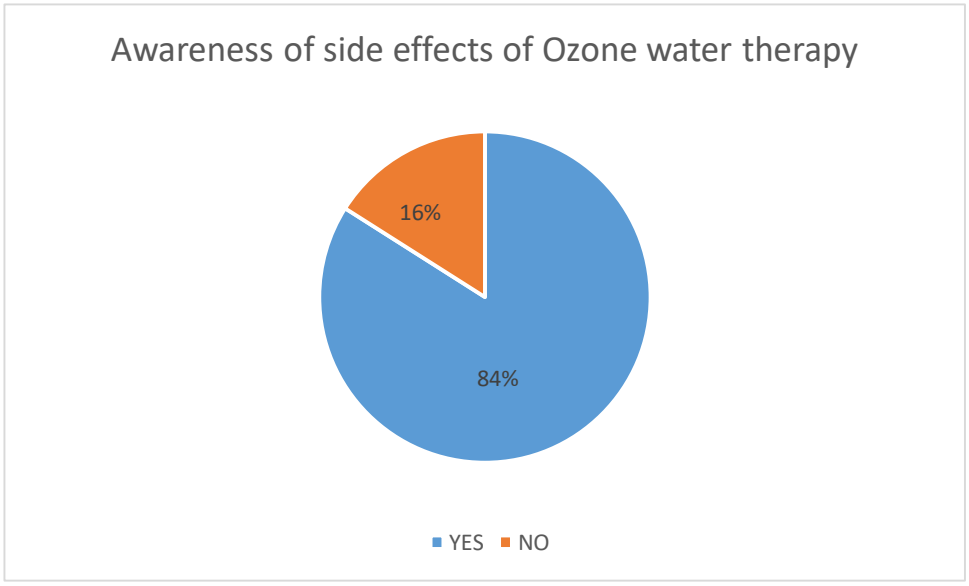


Fig.4:Awareness of side effects of Ozone water therapy



Discussion

Oxidative harm to fundamental cell structures, for example, DNA,lipids, proteins and films is initiated by ROS. The mitochondrial electron transport chain is a significant wellspring of intracellular ROS and is helpless to harm started by ROS . ROS conceivably actuates cell cancer prevention agent protection catalysts, including SOD . Already, it has been demonstrated that introduction to LPS increments coursing neutrophils prompting foundational oxidative pressure . Tissue neutrophils, monocytes and macrophages discharge inflammatory

cytokines including TNF-α . Past reports demonstrate O3 has solid cancer prevention agent exercises (Lippmann, 1989). In the current examination, the serum level of TNF-α and SOD serum action were essentially diminished and expanded, separately, in the ozonated water-treated contrasted with different groups. Inflammatory cytokines, including TNF-α, are significant inflammatory intercessor in peritonitis .(Krishna et al., 1998; Turrens, 2003)

Since O3 treatment incites oxidation in the body, the exercises of cancer prevention agent compounds, for example, SOD are expanded resulting to O3 treatment . In the test septic rodent model, the remedial impact of O3 treatment in the rectum was affirmed . Our outcomes show the ozonated water additionally display antioxidative and calming exercises. Past investigations demonstrate ROS was delivered following endotoxin shock-activated nuclear factor (NF)- κB and expanded the creation of inflammatory cytokines . Overexpression of SOD smothers TNF-α creation in human mammary cancer cells (Krishna et al., 1998; Schat et al., 2012).The awareness about clinical applications of ozone water is less among dental understudies. In any case, extra investigations ought to be performed to increase a comprehension of the component associated with the clinical impacts of ozonated water.

Conclusion

The awareness about the use of Ozone water therapy in medical applications is very less among dental students.Increased awareness programs and sensitization and continuing dental education programs along with greater importance to the curricular modifications should be incorporated to improve the awareness levels.

Funding support:

The authors declare that they have no funding support for this study

Conflict of Interest:

The authors declare that they have no conflict of interest

References

1. Aris, R. M., Christian, D., Hearne, P. Q., Kerr, K., Finkbeiner, W. E., & Balmes, J. R. (1993). Ozone-induced Airway Inflammation in Human Subjects as Determined by Airway Lavage and Biopsy. In *American Review of Respiratory Disease* (Vol. 148, Issue 5, pp. 1363–1372). https://doi.org/10.1164/ajrccm/148.5.1363
2. Balmes, J. R., Chen, L. L., Scannell, C., Tager, I., Christian, D., Hearne, P. Q., Kelly, T., & Aris, R. M. (1996). Ozone-induced decrements in FEV1 and FVC do not correlate with measures of inflammation. In *American Journal of Respiratory and Critical Care Medicine* (Vol. 153, Issue 3, pp. 904–909). https://doi.org/10.1164/ajrccm.153.3.8630571
3. Bocci, V. (2002). Does Ozonetherapy Have a Future in Medicine? In *Oxygen-Ozone Therapy* (pp. 369–374). https://doi.org/10.1007/978-94-015-9952-8_38

4. Bocci, V. A., Zanardi, I., & Travagli, V. (2011). Ozone acting on human blood yields a hormetic dose-response relationship. In *Journal of Translational Medicine* (Vol. 9, Issue 1). https://doi.org/10.1186/1479-5876-9-66
5. Bocci, V., Zanardi, I., & Travagli, V. (2011). Has oxygen-ozonetherapy a future in medicine? In *Journal of Experimental and Integrative Medicine* (Vol. 1, Issue 1, p. 5). https://doi.org/10.5455/jeim.161210.ir.002
6. Burns, D. T., & Thorburn Burns, D. (1997). Early problems in the analysis and the determination of ozone. In *Fresenius' Journal of Analytical Chemistry* (Vol. 357, Issue 2, pp. 178–183). https://doi.org/10.1007/s002160050133
7. Devlin, R. B., McDonnell, W. F., Mann, R., Becker, S., House, D. E., Schreinemachers, D., & Koren, H. S. (1991). Exposure of humans to ambient levels of ozone for 6.6 hours causes cellular and biochemical changes in the lung. *American Journal of Respiratory Cell and Molecular Biology*, *4*(1), 72–81.
8. Harber, P., Schenker, M., & Balmes, J. (1996). *Occupational and Environmental Respiratory Disease*. Mosby Incorporated.
9. Krishna, M. T., Madden, J., Teran, L. M., Biscione, G. L., Lau, L. C., Withers, N. J., Sandström, T., Mudway, I., Kelly, F. J., Walls, A., Frew, A. J., & Holgate, S. T. (1998). Effects of 0.2 ppm ozone on biomarkers of inflammation in bronchoalveolar lavage fluid and bronchial mucosa of healthy subjects. *The European Respiratory Journal: Official Journal of the European Society for Clinical Respiratory Physiology*, *11*(6), 1294–1300.
10. Lippmann, M. (1989). Health effects of ozone. A critical review. *JAPCA*, *39*(5), 672–695.
11. Murphy, M. P. (2009). How mitochondria produce reactive oxygen species. In *Biochemical Journal* (Vol. 417, Issue 1, pp. 1–13). https://doi.org/10.1042/bj20081386
12. Ozmen, V., Thomas, W. O., Healy, J. T., Fish, J. M., Chambers, R., Tacchi, E., Nichols, R. L., Flint, L. M., & Ferrara, J. J. (1993). Irrigation of the abdominal cavity in the treatment of experimentally induced microbial peritonitis: efficacy of ozonated saline. *The American Surgeon*, *59*(5), 297–303.
13. Schat, K. A., Kaspers, B., & Kaiser, P. (2012). *Avian Immunology*. Academic Press.
14. Scott, D. B. M., McNair Scott, D. B., & Lesher, E. C. (1963). EFFECT OF OZONE ON SURVIVAL AND PERMEABILITY OF ESCHERICHIA COLI. In *Journal of Bacteriology* (Vol. 85, Issue 3, pp. 567–576). https://doi.org/10.1128/jb.85.3.567-576.1963
15. Turrens, J. F. (2003). Mitochondrial formation of reactive oxygen species. In *The Journal of Physiology* (Vol. 552, Issue 2, pp. 335–344). https://doi.org/10.1113/jphysiol.2003.049478