Original research article

Knowledge And Awareness of The Preoperative Oral Hygiene of Patients Among Surgery and Anaesthesia PG Students.

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Abstract:
Adequate oral and dental hygiene has become challenging for the users especially elderly people and patients undergoing or recovering from radiotherapy/chemotherapy. Poor oral hygiene can lead to lung infection and cardiovascular events in patients undergoing surgery under general anaesthesia. This study aims to assess the level of awareness and knowledge of preoperative oral hygiene of patients among surgery and anaesthesia junior residents. **Materials and methodology:** This is a cross sectional observational study in which data collection was done using electronic questionnaire (google forms). **Results:** A total of 89 junior residents completed the questionnaire, out of which 49 (55.1%) were female and 40 (44.9%) were male. This study showed that 3.4% of our sample population was not aware of the risks associated with poor oral hygiene of the patients preoperatively while 95.5% knew the Importance of preoperative oral hygiene. **Conclusion:** Preoperative oral hygiene is a low cost and convenient method that should be promoted for more patients undergoing general anaesthesia, particularly those with limited self-care ability.

Introduction: Major cause of oral diseases such as gingivitis and periodontitis is dental plaque.[1,2] Effective plaque control by self-performed oral hygiene can prevent these diseases.[3,4] Tooth brushing has become a pretty well-established preventative health behaviour in the last few decades in many regions of the world.[5] It might perhaps be the health behaviour that people practice the most frequently and regularly these days. All of the recent initiatives made to improve oral health behaviours among the general public have been remarkably successful. [1,6]

The mouth cavity is a possible reservoir for respiratory pathogens due to the anatomical continuity between the lungs and the cavity. To enter the lower respiratory tract, an infectious pathogen must circumvent complex mechanical and immune defense systems. In healthy individuals, the defense systems are so effective that even with a high bacterial load (10^6 aerobic and 10^7 anaerobic bacteria per milliliter) in the upper airway, the distal airway and lung parenchyma remain sterile. When the host's defenses are weak, the pathogen is extremely virulent, or the inoculum is too strong, an infection results.[7] Although the microorganisms can

enter the lung through inhalation, aspiration of what pneumologists have long called oropharyngeal secretions is the most prevalent way of infection.[7,8]

The endotracheal tube (ETT) disrupts the regular physiological processes of breathing in patients under general anaesthesia, especially the natural barrier function of the trachea, and creates a direct channel for transfer of bacteria to the trachea from the oropharynx through the open glottis.[9.10,11]. General anaesthesia-related postoperative complications include pneumonia, and bacterial pneumonia is a frequent cause of death and morbidity. Dysbiosis and poor dental hygiene are two major risk factors for pneumonia and most infections have been shown to have colonized the mouth cavity prior to the diagnosis of pneumonia. Prior studies have shown that dental hygiene interventions, such as using chlorhexidine, povidone-iodine, and purified water can lower the incidence of lung infections.[12,13,14]

Increased risk of coronary artery disease is linked to periodontitis; this link also holds true for stable and subclinical coronary artery disease.[15,16} Additionally, genetic research has indicated the involvement of a common susceptibility gene in the pathophysiology of cardiovascular and periodontal diseases.[15,17]

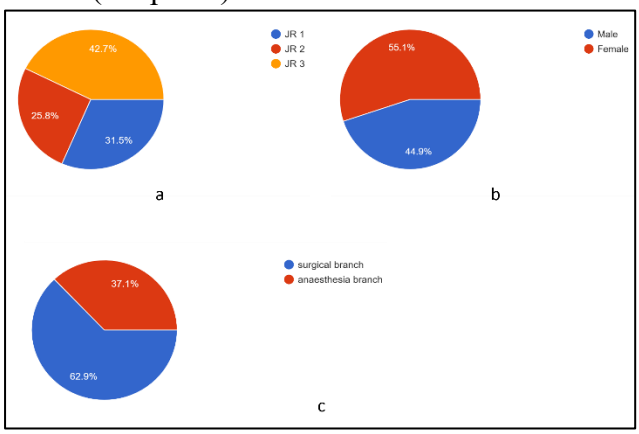
This study aims to assess the level of awareness and knowledge of preoperative oral hygiene and its association with general anaesthesia and regional anaesthesia, lung infection and cardiovascular diseases among anaesthesia and surgery residents doing post graduation from the rural tertiary care hospital.

Materials and methodology: This is a cross sectional observational study conducted in a rural tertiary care hospital. A structured questionnaire was used as the study tool. The questionnaire contained 9 questions which analysed sociodemographic data and level of knowledge and awareness of importance of preoperative oral hygiene among junior residents of anaesthesia and surgical branch. The questionnaire and was distributed among the junior residents doing post graduation from the rural tertiary care hospital. The data collection was performed using electronic questionnaire (google forms) that was distributed to the residents. Only the junior residents doing post graduation in anaesthesia and surgical branches were included in the study. Junior residents from the nonsurgical branch, senior residents and professors were not included in the study.

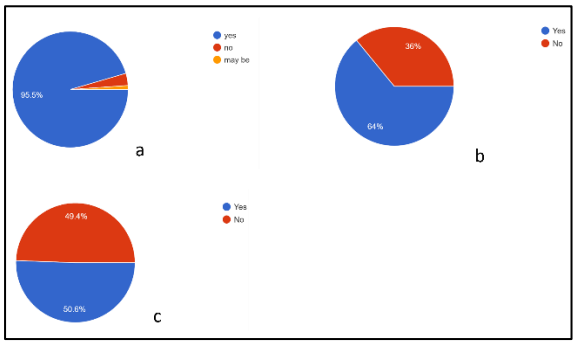
Results:

A total of 89 junior residents completed the questionnaire, out of which 38 (42.7%) were third year residents, 23 (25.8%) were second year residents, 28 (31.5%) were first year residents (Graph 1a). Out of 89 junior residents 49 (55.1%) were female and 40 (44.9%) were male (Graph 1b). 33 (37.1%) were from anaesthesia branch and 56 (62.9%) were from surgical branch (Graph 1c). Our study showed that 3.4% of our sample population was not aware of the risks associated with poor oral hygiene of the patients preoperatively while 95.5% knew the Importance of preoperative oral hygiene (Graph 2a). 36% of residents did not advice their patients to brush their teeth or do mouth gargle preoperatively whereas 64% residents did (Graoh 2b). 74.2% of our sample population thought that preoperative oral hygiene prevents lung infection in patients undergoing surgery under general anaesthesia whereas 23.6% thought that preoperative oral cleansing has no significant effect on incidence of lung infection in patients undergoing surgery under general anaesthesia (Graph 3a). 46.1% subjects believed that oral care is essential for patients undergoing surgery under spinal or regional anaesthesia whereas 22.5% subjects believed that oral care is not essential for patients undergoing surgery under spinal or regional anaesthesia (Graph 3b). 59.6% subjects believed that proper oral

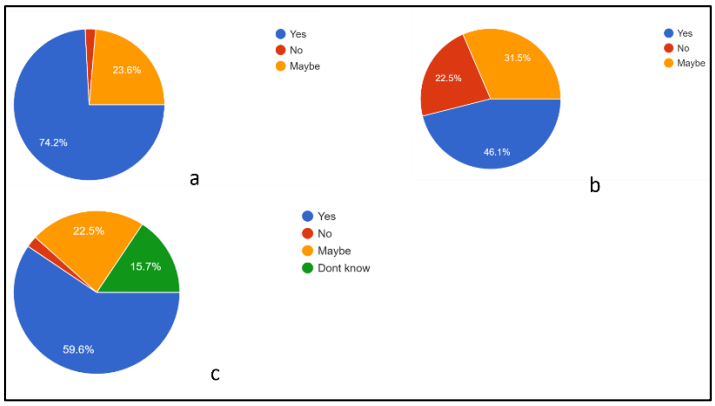
hygiene preoperatively decreases the risk of cardiovascular events perioperatively whereas 15.7% subjects were unaware of benefits of proper oral care in reducing perioperative cardiac events (Graph 3c).



Graph 1a: Year wise distribution of junior residents, **Graph 1b:** Gender wise distribution of residents, **Graph 1c:** Branch wise distribution of residents



Graph 2a: Is it necessary to ensure oral hygiene preoperatively, **Graph 2b***:* Do you specifically advice the patient to brush the teeth or gargle with mouthwash preoperatively?, **Graph 2c***:* Are patients asked to brush their teeth or do mouthwash on the day of surgery before shifting to operation theatre?



Graph 3a: Is oral care preventive for lung infection if patient is undergoing surgery under general anaesthesia?, **Graph 3b:** Is oral care essential for patients undergoing surgery under

regional or spinal anaesthesia?, **Graph 3c:** Is oral care important to reduce cardiovascular events perioperatively?

Discussion:

This survey conducted among junior residents provides valuable insights into their awareness, perceptions, and practices regarding preoperative oral hygiene and its impact on surgical outcomes. A similar study conducted by Mona A Kamil et al study showed that most of the participants had poor awareness about the impact of periodontal disease on specific systems such as cardiovascular system and respiratory system unlike our study in which most of the participants were aware about the impact of oral hygiene on cardiovascular system and respiratory system perioperatively.[18] Philippe Mojon et al study showed that there is direct evidence of association between pulmonary infection and oral diseases in patients with severely compromised health.[7] Yu Shuai et al study showed that preoperative oral cleansing has no significant effect on incidence of lung infection in patients undergoing surgery under general anaesthesia.[9]

The study revealed that 95.5% of junior residents understood the importance of preoperative oral hygiene. This high level of awareness is commendable and aligns with the body of evidence that underscores the significance of oral care in reducing postoperative complications. For instance, Scannapieco and Shay (2001) have highlighted that poor oral hygiene is closely linked to an increased risk of respiratory infections, particularly in patients undergoing general anaesthesia. These infections can lead to serious complications, including pneumonia, which can adversely affect patient outcomes and prolong hospital stays.

However, it is concerning that 3.4% of the residents were unaware of the risks associated with inadequate oral hygiene preoperatively. This gap in knowledge, though small, is significant given the potential implications for patient safety. Previous studies, such as those by Yoneyama et al. (1999), have shown that targeted oral care interventions can substantially reduce the incidence of postoperative pneumonia, especially in vulnerable populations like the elderly. Thus, integrating comprehensive oral hygiene education into medical training programs is crucial to ensure that all healthcare providers are well-informed about these risks and preventive measures. Despite the high awareness, the practice of advising patients on preoperative oral hygiene was not uniformly observed, with 36% of residents not routinely recommending teeth brushing or mouth gargling. This discrepancy between knowledge and practice may stem from several factors. Time constraints in clinical settings, perceived patient non-compliance, and a lack of standardized guidelines may all contribute to this gap. Quinn et al. (2009) similarly observed that healthcare professionals often acknowledge the benefits of preoperative oral care but face challenges in implementing these practices consistently. Addressing these barriers through institutional support and clear guidelines could enhance adherence to recommended practices. Furthermore, the implementation of oral hygiene protocols can be influenced by the perceived importance of these measures among healthcare providers. While 64% of residents advised preoperative oral care, ensuring that this becomes a routine part of preoperative preparation requires systemic changes. Hospitals and surgical centres could benefit from developing and enforcing standardized protocols that emphasize the importance of oral hygiene as part of comprehensive preoperative care.

The belief that preoperative oral hygiene can prevent lung infections during surgeries under general anaesthesia was held by 74.2% of the residents. This aligns with findings from studies such as Tada and Hanada (2010), which indicated that oral care reduces microbial load and

prevents respiratory complications. However, 23.6% of residents believed that preoperative oral cleansing had no significant effect on lung infection rates. This misconception highlights the need for enhanced educational efforts to convey the robust evidence supporting the role of oral hygiene in reducing respiratory infections.

Regarding surgeries under spinal or regional anaesthesia, 46.1% of residents believed oral care was essential, whereas 22.5% did not. This variation may be due to the misconception that oral hygiene is less critical in these types of anaesthesia. Nonetheless, maintaining good oral hygiene is beneficial regardless of the anaesthesia type, as it reduces the overall microbial burden and potential for systemic infections. Emphasizing the universal importance of oral care in all surgical contexts is essential for comprehensive patient care.

The belief that proper oral hygiene preoperatively decreases the risk of cardiovascular events was held by 59.6% of residents. This is reflective of the growing body of evidence linking oral health with cardiovascular outcomes. Studies like those by Offenbacher et al. (1996) have demonstrated that periodontal disease can significantly increase the risk of cardiovascular events due to systemic inflammation and bacterial dissemination. However, 15.7% of respondents were unaware of these benefits, indicating a knowledge gap that could be addressed through targeted educational initiatives.

The link between oral health and cardiovascular risk underscores the importance of integrating oral care into the broader framework of perioperative management. Educating residents on the systemic implications of oral health can enhance their understanding and encourage more consistent practices. For instance, routine preoperative assessments could include oral health evaluations, and interdisciplinary collaboration with dental professionals could be fostered to ensure comprehensive patient care.

Conclusion: Preoperative dental hygiene is an inexpensive and practical measure that need to be encouraged for a greater number of patients undergoing general anesthesia, especially those with restricted capacity for self-care. Enhancing dental hygiene practices may lower the chance of pneumonia in individuals who are susceptible. Even though a direct link between poor oral hygiene and respiratory infections has not been shown, it can still be beneficial to do routine recalls among patients who are considered to be "at risk" and to offer specific oral hygiene education to caregivers in long-term care facilities.

Limitation of the study: This is a single centre study. Future research endeavours should focus on multicentre collaborations, prospective cohort studies, and standardized outcome measures to further enhance our knowledge and awareness among the junior residents about the importance of preoperative oral hygiene in patients. We assessed the knowledge and awareness of all the junior residents as a whole. We did not compare the knowledge of first year junior residents with second year junior residents and third year junior residents as interaction and experience of all the junior residents is different with the patients.

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