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# Impact Of Oral Hygiene In The Postoperative Outcome Of General Surgery Patients

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## I. INTRODUCTION

Oral poor hygiene is common in general surgery patients, causing overall health problems. The impact of poor oral hygiene on surgical results is unknown. The oral care of patients in general surgery acute care units and wards is vital. Postoperative oral cavity hygiene reduces ventilator-associated pneumonia[1]. Poor oral hygiene causes dysphagia and restricted mouth opening, limiting post-operative surgical patient's intake. Simple procedures like inpatients brushing their teeth or using mouthwash liquid with chlorhexidine assist reduce bacterial load in the oral cavity, promote excellent hygiene, and avoid gingivitis and other periodontal diseases. Failure to take basic precautions might have serious consequences for surgery patients. It is, therefore, an essential aspect of ICU patient care, but problematic in ventilated patients. Surgical patients are more prone to poor oral hygiene. Sodium bicarbonate solution mouthwash reduces oral mucosal viscosity, and perioral topical petroleum-based jelly promotes skin integrity[2]. The most significant post-operative consequence is pneumonia (2.6-3.5%). Post-operative pneumonia is caused by aspiration of oral and pharyngeal secretions. Good dental hygiene may lower the incidence[3]. Tobacco biofilms on the tongue and teeth may harbor lung infections[4]. Mechanically reduce biofilm bacteria[5]. Dentists have a unique role in preventing pneumonia in hospitals. Dentists are better than anybody else in preventing VAP[6,7]. It is unknown whether dental treatment before surgery reduces pneumonia and morbidity. Preoperative dental care has been demonstrated to minimize the incidence of pneumonia in cardiac[8,9] and oncological[9,10] surgery, but these trials were infrequent and the sample size was small.

## II. MATERIALS AND METHODS

After Institutional Ethical Committee approval This research was conducted from June to December 2021 at a tertiary care hospital in India. The research included 108 patients. Each participant signed an informed consent form and was briefed on the study process.

The research covered all participants over 18. Uncontrolled T2DM, oral pathological disorders and long-term corticosteroid use were also regarded as exclusion factors.

The interview and questionnaire asked about patient's age, gender, smoking, diabetes, systemic illnesses.

The dentist examined all patient's mouths and teeth. All recent dental disorders including abscesses or cellulitis were recorded, as well as oral hygiene practices (tooth brushing, dental flossing, mouth rinse, or all three). We used an explorer and a dental mirror with a flashlight to examine our teeth. We also noted gingivitis, tooth movement, and gingival recession.

| **Oral health based on clinical assessment using the Revised Oral Assessment Guide—ROAG** | | | |
|---|---|---|---|
| **Item category** | **Grade 1 findings** | **Grade 2 findings** | **Grade 3 findings** |
| **Voice** | normal | Dry, hoarse, smacking | Difficult to speak |
| **Lips** | smooth; bright red; moist | Dry, cracked, sore corners of the mou th | Ulcerated, bleeding |
| **Mucous membranes** | bright red; moist | Red; dry or areas of discolouration, coating | Wounds, with or without bleeding, blisters |
| **Tongue** | pink, moist with papillae | No papillae, red, dry coating | Ulcers with or without bleeding, blistering |
| **Gums** | Light red and solid | Swollen, reddened | Spontaneous bleeding |
| **Teeth** | Clean; no visible coating, food d ebris | Coating or food debris locally | Coating, food debris generally or broken teeth |
| **Dentures** | Clean; works | Coating or food debris | Not used or malfunctioning |

| | | | |
|---|---|---|---|
| **Saliva** | Glides easily | Glides sluggishly | Does not glide at all |
| **Swallowing** | Unimpeded swallowing | Insignificant swallowing problems | Pronounced swallowing problems |

**Figure 1: Revised oral assessment guide.**

The ROAG is a good screening tool for a detailed assessment with high specificity and sensitivity for oral health assessment.
Grades are 0 = not relevant to assess, 1 = healthy/normal, 2 = moderate change, 3 = severe change.

## III. SURGICAL PROCEDURE AND POSTOPERATIVE MANAGEMENT

Our department's regular practice achieved the following:

1. Patients bathe the night before the operation.
2. Surgical site shaving using an electric clipper
3. Antibiotic prophylaxis with 1 or 2 g ceftriaxone intravenous 30 minutes before surgery,
4. Antibiotic was repeated three hours after surgery or if more than 1000 cc bled during surgery.
5. A drain was placed after surgery depending on the scenario.
6. .Postoperative management was performed according to the clinical pathway in the hospital.
7. Antibiotics were routinely administered to patients postoperatively. The wound, drainage, and fever were checked.

The categorisation of patients as SSI-positive or SSI-negative was done using the CDC classification. The CDC categorises SSI as superficial, deep, or organ involvement. The superficial kind refers to localised skin and subcutaneous tissue infection.

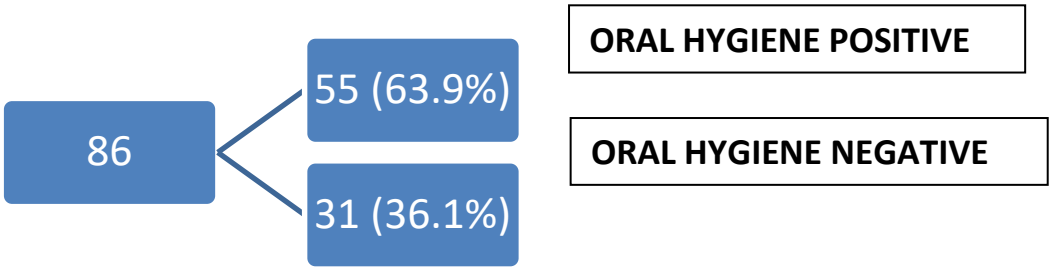
## IV. RESULTS

A total of 92 patients were evaluated. 6 patients were excluded from the study due to non-cooperation to participating in the study. 86 patients who underwent general surgery procedures were included in the study and evaluated, out of which 28 (32.5%) were female and 58 (67.5%) were male. The mean age of patients was 43.52 years.

21( 24.4%) patients were SSI positive and 65 (75.6%) patients were SSI negative. No death occurred among the study group. Out of 21 SSI positive patients, 7 (33.3%) patients had fair oral hygiene whereas 14 (66.7%) patients had poor oral hygiene. Out of 65 SSI negative patients, 48 (73.8%) patients had fair oral hygiene whereas 17 (26.2%) patients had poor oral hygiene.

**Table 1**: Relationship of history of oral infection (OI) with surgical site infection

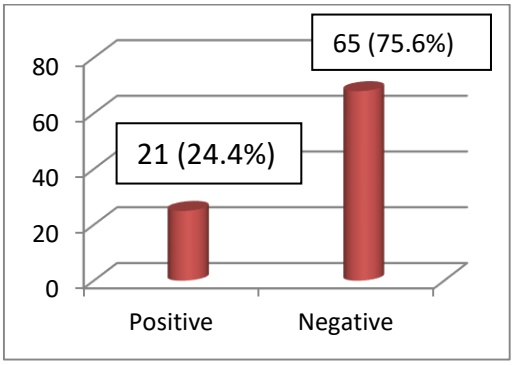
| | + | - |
|---|---|---|
| + | 7 (33.3%) | 14(66.7%) |
| - | 48 (73.8%) | 17 (26.2%) |




**Flowchart 2**

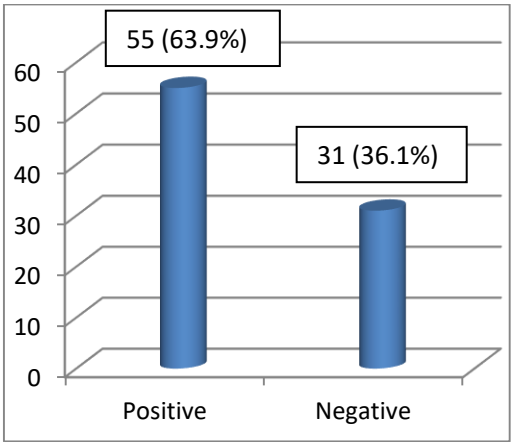
## V. DISCUSSION

Surgical site infection is the most common hospital-acquired infection occurring postoperatively. The prevalence of SSI varies from 0.7 to 16% .Common risk factors for SSI include old age, history of previous infection, smoking, diabetes mellitus cardiovascular diseases, chronic obstructive pulmonary disease and malnutrition .




**Graph 1**: Surgical site infection

In the current study, we found a significant association between SSI and dental caries.




**Graph 2**: Oral hygiene

Since the main objective of this study was to assess the correlation of SSI and oral health, sample size was calculated to determine that this correlation and other risk factors such as diabetes mellitus and smoking were excluded and their correlation with SSI was not evaluated. Furthermore, this study can contribute to improving the prevention of postoperative SSI. Previously reported strategies for prevention of postoperative SSI include oral care such as tooth brushing or using chlorhexidine only. Preoperative oral care is generally performed by patients themselves or by nursing staff members; however, these people do not have enough training to remove biofilms from the teeth, tongue and oral mucosa, and they cannot remove dental calculus and biofilms in the periodontal pockets, which are reservoirs of pathogens. The involvement of dentists in the preoperative management of patients who are undergoing cancer surgery may be essential for decreasing postoperative complications.

Case-control design was a strength of this study. Moreover, to our knowledge this study was the first to assess this correlation and no similar study has been conducted. The limitations of our study were small sample size and not obtaining a culture from the oral cavity prior to surgery. Therefore, designing of a large randomized control trial study to evaluate this issue is needed. The results may not be generalizable to other countries because the study included only patients from northern geographical region of India.

Oral health status deteriorated in patients with higher ROAG score. The incidence of postoperative SSI was higher in patients with poor oral hygiene. Moreover, preoperative oral health status was independently associated with risk of SSI. Our findings demonstrate the importance of evaluating preoperative oral health status for postoperative outcomes. The clinical effects of oral health status on long-term outcomes and prognosis should be investigated in the future.

## VI. CONCLUSIONS

Working with standardised oral health assessment, like ROAG provides the opportunity to detect risks and problems. Individuals and the healthcare system have been burdened by infections at the surgical site. Following surgical therapy, the current study showed a strong link between SSI and poor oral hygiene. As a result, it's a good idea to send these patients to the dentist for a comprehensive dental and oral checkup before they have elective surgery. To fully comprehend these linkages, further study with larger samples is needed.

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