Evaluation of the Prevalence of Comorbidities in Patients Reporting for Dentoalveolar Surgeries

Abstract

Background: Medical comorbidities have varied effects on the management of a patient for dentoalveolar surgeries. Prior diagnosis and prudence in such conditions is of utmost importance for avoidance of complications and overall welfare of the patient. There is a dilemma on the extent of investigations required to evidently ascertain the medical status and fitness of a patient for a dental procedure. The objective of this study was to evaluate the prevalence of medical comorbidities in patients reporting for dentoalveolar surgeries, which would help provide data to establish an evidence-based protocol for perioperative workup of all dental surgeries. Methodology: A total of 2872 patients were included in this study age ranging from 13 years to 84 years. Detailed case history of the patient and baseline blood investigations were recorded. Physician’s consultation was acquired to identify any medical comorbidity the patient may be suffering from. Results: It was observed that 17.8% of the patients were detected with medical co-morbidities. Hypertension and Diabetes being the most prevalent (Hypertension: 9.1% and Diabetes: 6.2%). This study has shown that 8.8% of all patients in our study were either newly diagnosed with comorbidities or were inappropriately treated for a prediagnosed comorbidity. Conclusion: We conclude that only relying on the medical history provided by the patient is not sufficient to rule out any medical comorbidities and there is a chance of missing out on any undiagnosed medical condition that the patient may be suffering from.

Keywords: Dentoalveolar surgeries, medical comorbidities, medical history, preoperative evaluation, perioperative management

Introduction

A thorough understanding of patients’ medical problems is of paramount importance to provide safe and effective dental treatment. Older patients tend to have a higher prevalence of cardiovascular, degenerative, endocrine disorders, while younger patients are more likely to have neurological and hematological disorders.[1]

A dental practitioner should be aware of such conditions and medical consultation may often be required for proper coordinated management of the patient’s dental as well as overall health. Modifications in the dental management due to compromising medical conditions are often mandatory to decrease the chances of intraoperative and postoperative complications.[1]

In developing countries like India, many of the systemic diseases go undiagnosed[1] because of the lack of periodic systematic health checkup policies and access to healthcare. Hence, it is necessary for all dental practitioners to critically evaluate the medical fitness of the patient prior to any dental procedure. Moreover, dental consultation could serve as an opportunity to do a baseline health checkup, which could bring to light some subclinical comorbidities.

As the overall life expectancy has increased in the last decade,[2] there is an increase in the number of patients over the age of 60 years demanding dental care. These patients are more likely to suffer from chronic medical conditions which may require special care.[3]

The objective of this study was to acquire data on the prevalence of medical comorbidities in patients reporting for dentoalveolar surgeries, which will help in formulating an evidence-based protocol for perioperative evaluation of a patient for these procedures.

Methodology

Approval for conducting this study was obtained from the

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Institutional Ethics Committee of the concerned dental college on 07/07/2017 (Registration No. IEC – MGMDCH – 12/2017).

Data were obtained from all the patients visiting the Oral and Maxillofacial surgery department of a dental college for dentoalveolar surgeries. A detailed medical history was recorded by a predesigned comprehensive history form by an attending doctor; vitals were recorded (viz., blood pressure, pulse rate, respiratory rate). All patients were sent for blood investigations (viz., complete blood count, bleeding time, clotting time, random blood sugar).

All patients above 40 years were sent for an ECG.

Appropriate medical consultation was done if required.

**Statistical evaluation**

The data was entered in MS Excel. The continuous variables were summarized using descriptive statistics and the categorical variables were summarized using frequencies and percentages. The data was displayed using appropriate charts and graphs.

A Pearson’s Chi square test was used to find significant differences between two proportions.

An alpha level of 0.05 was used as a cut point for statistical significance along with 95% confidence intervals. All data were analyzed using IBM SPSS v22 software.

**Results**

A total of 2872 patients were included in this study (1472 males and 1400 females) aged from 13 years to 84 years (mean 42.96 with standard deviation 16.31).

Out of 2872 patients, 513 were detected with one or more medical comorbidities (17.8%). About 260 were males (17.6%) and 253 were females (18.07%). There was no statistical significance ($P = 0.808$) between the prevalence of medical comorbidities between males and females [Table 1].

Hypertension and diabetes mellitus were found to be the most prevalent comorbidities with hypertension having a prevalence of 9.1% and diabetes mellitus 6.2%.

Out of 513 patients having comorbidities, 425 patients (82.8%) were having only one comorbidity, 65 patients (12.7%) had two comorbidities, and 23 patients (4.4%) were having more than two comorbidities [Figure 1].

A correlation was found between diabetes and hypertension, 263 patients were suffering from hypertension and 78 patients had diabetes mellitus. The odds of having diabetes in a hypertensive patient were 7.586 times more (95% CI, 5.813–9.899) than patients not having hypertension, which was statistically significant [$\chi^2(1) = 269.62, P < 0.001$].

About 8.8% of all patients in our study were either newly diagnosed with a comorbidity or were inappropriately treated for a prediagnosed comorbidity. Of the patients having comorbidities ($n = 627$), 28.5% ($n = 179$) were newly diagnosed, while 11.8% ($n = 74$) cases were inappropriately treated [Table 2].

A Cochran–Armitage test of trend was run to determine whether an increase in age increases the incidence of comorbidities. The age groups considered were <30 years ($n = 1061$), 31–45 years ($n = 910$), 46–60 years ($n = 639$), and >60 years ($n = 262$).

About 8.1% of the population below the age of 30 was diagnosed with a medical comorbidity, while 14.5% and 28.4% were diagnosed in age groups “31–45” and “46–60,” respectively. About 43.5% of patients were above 60 years [Figure 2].

The Cochran–Armitage test of trend showed a statistically significant linear trend [$\chi^2(1) = 230.704, P > 0.001$], with higher age group associated with a higher proportion of patients suffering from comorbidities.

**Discussion**

As medical sciences have evolved in the last few decades, there is not only a decrease in the mortality rate but also improved quality of life of patients with complex medical ailments.[4] More number of patients with complex health problems are reporting for dentoalveolar surgeries. It is of paramount importance for a dentist to be cognizant with the possibility of medical comorbidities with his patients and its implications on the dental management.

The WHO statistics reveal that the prevalence of chronic diseases like hypertension and diabetes is on the rise. In 2012, it was estimated that more than 40% of the
populations had high blood pressure and 1 in 10 patients had a higher than normal blood glucose level.

Fattahi\[5\] have classified dentoalveolar surgeries as minimally invasive procedures which carry mild risks to the general health of the patient. However, the importance of preoperative evaluation of the patient’s health status should not be underestimated.

Dentoalveolar surgeries are physiologically stressful situations which require appropriate functioning of all body systems to cope up with. Hence, it is imperative to procure baseline data of the health status of the patient to prevent any untoward intraoperative or postoperative complication.

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Table 2: Distribution of comorbidities based on previous diagnosis and treatment

| Comorbidity                | Newly diagnosed | Previously diagnosed but inappropriately treated | Previously diagnosed and appropriately treated | Total |
|----------------------------|-----------------|--------------------------------------------------|------------------------------------------------|-------|
| Hypertension               | 101             | 36                                               | 126                                            | 263   |
| Diabetes                   | 55              | 36                                               | 89                                             | 180   |
| Anemia                     | 20              | 0                                                | 6                                              | 26    |
| COPD                       | 0               | 0                                                | 5                                              | 5     |
| Bleeding disorders         | 2               | 0                                                | 0                                              | 2     |
| Coronary artery disease    | 1               | 0                                                | 14                                             | 15    |
| Hypothyroidism             | 0               | 2                                                | 28                                             | 30    |
| Others                     | 0               | 0                                                | 106                                            | 106   |
| Total                      | 179             | 74                                               | 374                                            | 627   |

Percentage

28.5 11.8 59.7

COPD = Chronic obstructive pulmonary disease

A study by Walia et al.\[6\] in 2016 revealed that the prevalence was much higher, that is, 26.5%, as recorded by a dental trainee using predesigned case history forms.

A much higher prevalence of 55.5% was reported by Saengsirinavin et al. in 1990.\[7\]

Cottone and Karawy in 1979 in USA have reported that 68.5% of the patients visiting their dental care unit were under a medication other than those related to their dental treatment.

As we compare the results from Dhanuthai et al. and Walia et al., we can suggest that the questionnaire-based survey had underestimated the prevalence of medical comorbidities. Moreover, these studies did not include any objective measurements, namely, vitals and blood investigations.

Hence, we can evidently conclude that only relying on the medical history provided by the patient may not be sufficient to rule out any medical comorbidities that the patient may be having.

This study has shown that 8.8% of all patients included in this study were either newly diagnosed with a comorbidity or were inappropriately treated for a pre-diagnosed comorbidity, that is, 28.5% of all cases having medical comorbidities were newly diagnosed, while 11.8% cases were inappropriately treated. These patients required medical consultation for appropriate management.

In this study, 8.1% of the population below the age of 30 were diagnosed with a medical comorbidity, while 14.5% and 28.4% were diagnosed in age groups “31–45” and “46–60,” respectively. About 43.5% of patients were above 60 years.

Umino and Nagao in 1993\[8\] reported that one or more medically compromised conditions were encountered in 64.2% of geriatric Japanese dental patients.

This clearly shows that as age advances, the prevalence of medical comorbidities also increases. Patients of older age groups are more likely to have a medical comorbidity and...
it would be reasonable to perform certain investigations like the ECG or stress test to determine the physical fitness of the patient even in the absence of any known ailment.

A total of 489 patients were lost to follow-up and hence were excluded from the study. Some of these patients may have begun visiting other dental care centers where such elaborate investigations were not being performed, which would have saved their efforts and time.

If this was the case, it indicates the callous attitude of dental practitioners toward the preoperative evaluation of a patient for dentoalveolar surgeries.

We had sent patients above the age of 40 years for an ECG. Out of 540 patients, only 26 patients had ECG changes, all of which were inconclusive to diagnose a specific disorder and needed further evaluation.

Hence, the rationale for performing an ECG on patients above 40 years could not be ascertained by this study.

**Conclusion**

We conclude that it is prudent to check the vitals (viz., blood pressure, pulse, and respiration) and send the patient for blood investigations (viz., RBS, Hb, bleeding, and clotting time). A physician’s consultation is necessary if the past medical history arouses suspicion of a medical comorbidity.

Further studies are required to device a comprehensive protocol for preoperative evaluation of patients for dentoalveolar surgery, which would emphasize minor details of the patient’s medical history and it may include certain medical investigations to decrease the chances of missing out on any undiagnosed medical condition the patient may be suffering from.

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**Conflicts of interest**

There are no conflicts of interest.

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