



RESEARCH ARTICLE

ALLERGIC REACTION CAUSED BY TITANIUM CONTAINING DENTAL IMPLANTS

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ABSTRACT

Titanium is known to be a non-allergic material. However many studies show cases of metal allergy caused by titanium containing materials. Two-hundred random volunteers were taken as a study sample between the age group of 18-60 years and described after patch test was done. Observation showed allergic symptoms in about 4% of the subject population.

Discussion: Applications such as plastic surgery, dental implants, white pigments etc. Titanium is used in the form of titanium dioxide which leads to rapid expansion of titanium containing products. This rapid expansion of titanium containing products leads to increase in percutaneous and premucosal exposure of titanium in the population.

Conclusion: Risk of titanium containing material leading to allergy is lesser than that of other metal material. Therefore during implant placement patient should be asked regarding medical history of hypersensitivity reactions to metals and patch testing should be done.

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INTRODUCTION

Various types of organic and metallic materials have been used for prostheses out of which titanium screws have a good nature of biocompatibility. There have been frequent use of titanium products in plastic surgeries, dental implants. Thus use of titanium products have increased in today's day to day life. However recent studies reported cases of allergic symptoms caused by titanium materials with recent advances in smelting technology with increase in titanium products. The study was conducted using patch test methodology having 0.5% titanium dioxide in petrolatum base. The results were compared between two groups of subjects; one which gave history of allergy when compared to other common metal allergens such as nickel and second group of individuals who did not show any history of allergy.

MATERIALS AND METHODS

Materials

1. 200 healthy volunteers were taken as subjects who agreed to take part in the study after explaining its method, importance, and its side effects.
2. Test allergen including titanium dioxide 0.5% in petrolatum base.

Methods

Permission was taken from the dean of the institution and the head of the department of prosthodontics and implantology where the research was conducted. An examiner was guided and trained to observe the reactions both positive and negative in the individual subject in order to avoid its variation. The subjects were explained about the study its importance and its adverse reactions. The area of examination was dried with surgical spirit where the allergens were going to be tested. About 0.5-0.7ml of the allergen was dispensed on the prepared site and the subjects were kept under observation and were informed to keep that site dry. The subjects were recalled after 24hrs. Based on the observation after 24hrs the subjects were classified as positive or negative. Subjects having erythema, pruritus, or papular lesions were classified as positive subjects whereas those who did not show any reactions were classified as negative subjects.



Figure 1. OPG showing titanium dental implant

RESULTS

Thus 4% of the subjects out of 200 showed response to patch test.

Table 1. Gender distribution between males and females

Gender	N=number of subjects	Percentage %
Male	120	60
Female	80	40
Total	200	100

Table 2. Results showing subjects having h/o allergy vs h/o without allergy

Results in patients	N=number of subjects	Percentage %
With h/o allergy	8	4
Without h/o allergy	192	96
Total	200	

DISCUSSION

From the above result titanium concludes to be a biocompatible material for most of the population of the subject. However in 4% of the small population of the subject it showed significant hypersensitivity reaction. Thus it is recommendable to conduct a non-invasive patch test in patient who shows history of allergy to other known metals.

Conclusion

Out of the total number of subjects tested about 4% of the subjects were found to be hypersensitive against titanium. It was observed that individuals who showed prior history of allergy to other known metals were susceptible to show allergic reaction caused by titanium. Thus in such patients patch test should be conducted first and other means of treatment such as nickel, zirconium should be undertaken.

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