



ORIGINAL ARTICLE

To evaluate allergic effects of the residual monomer by using auto polymerised acrylic resins amongst dentists.

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ABSTRACT... Objective: To evaluate the allergic effects of the residual monomer by using auto polymerised acrylic resins amongst dentists. **Study Design:** Cross Sectional study. **Setting:** Department of Prosthodontics, Isra Dental College, Hyderabad. **Period:** June 2019 to October 2019. **Material & Methods:** The study consists of 50 participants included Prosthodontist specialists, general dental practitioners and dental students. All contributors that filled a questionnaire regarding the allergic effects after using auto polymerised poly methyl methacrylate resin, identity of all participants will be kept private after taking consent. In questionnaire asked the questions from the contributors regarding the designation, qualification, usage duration, organs affected by allergy by using poly methyl methacrylate resin, any medical treatment acquired for allergy and what kind of precautions used for prevention of allergy. Data was analyzed thru SPSS version 21. Descriptive statistics such as frequency distribution, percentage were included in Data analysis. The level of significance was set at <0.05%. **Results:** This current study discovered that out of 50 participants, 64% were students, 25% general dentists and 10% specialists. Out of 50 participants, maximum participants 45% found the skin allergic reaction and minimum 8% found respiratory tract. Only 10 participants acquired the treatment and consults the doctor for allergic reactions and 25 participants did not acquired any treatment. **Conclusion:** Conclusion of this study was that the maximum contributors had allergic effects to the skin while many participants did not acquired or followed any therapeutic service to avoid surplus effects.

Key words: Allergic Effects Auto Poly Methyl Meth Acrylate Resin, Auto Polymerized Acrylic Resin and Material Hazards.

INTRODUCTION

In dentistry, acrylic based resin materials are very frequently used and they can be used for many purposes due to properties and characteristics of these materials. These materials are frequently used in the construction of denture bases, orthodontic removable appliances, temporary crowns, bridges and denture relining/rebasing procedures^{1,2,3,4} Dentists frequently used acrylic resin base materials for fabrication of removable prosthesis of completely and partially edentulous patients and even for fabrication of implant reinforced removable prosthesis.⁵ Orthodontic appliances such as space maintainers and arch expansion appliances also made up of acrylic resin.⁶ After tooth preparation, acrylic based resin materials are used for the fabrication of provisional restoration such as acrylic temporary

crowns and bridge are cemented with temporarily used luting material.⁷ In removable prosthesis, acrylic based relining materials are very suitable for improvement of denture's retention, stability, and support.⁸ Acrylic based resin materials are also used in impressions of completely edentulous arches for neutral zone recording and also useful as Soft liners.^{9,10} In modern dentistry, use of acrylic resin copings has been used frequently in restorative dentistry but not generally documented.¹¹

From 1960, Polymers are most commonly used in the field of dentistry. Dental resins containing Poly methyl methacrylate (PMMA) and Mono methyl methacrylate (MMA).¹²

Currently in field of dentistry, poly methyl-methacrylates (PMMA) are categorized on the

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basis of polymerisation, such as microwave activated, light cure, chemical cure and heat cure activated. After reaction of the residues of monomer content (Methyl Meth Acrylate) and formaldehyde is showing allergic reactions. The maximum residue contents approximately 0.1% to 5% are mostly found in chemically cured poly methyl methacrylate (PMMA).¹³

MMA is 10 parts/millions of air is acceptable environmental level i-e 100 ppm methyl methacrylate vapour or 410 mg/cubic meter of air in shift of 8 hours in working rooms and dental working laboratory.¹⁴ A trustworthy process to distinguish the protection level is to extent the quantity of elements in the environmental air atmosphere. More probabilities of allergic responses due to maximum contact time of residues.

Dental peoples are exposed to autopolymerized acrylic resins which have maximum monomer residual content. Different studies stated that auto polymerized acrylic resin cause injuries or abnormalities in several organs like nose, eyes, skin, respiratory tract, throat and nervous system leading to contact dermatitis (erythema and necrosis), irritation of skin, eyes, burning mouth, asthma with nasal olfactory epithelium disposed toward remain the principal location to become affected.^{14,15} Certain studies even revealed that this material is to be embryo poisonous and carcinogenic in animals.¹² in dentistry especially in the field of prosthodontics, auto polymerised acrylic resin has been commonly used. Unluckily several of exposed persons are unacquainted about the protection methods, permitted acquaintance of this type of harmful chemicals level therefore agonize from altered allergic response.

The aim of our study was to evaluate the frequency of damaging effects of auto polymerized acrylic resins which is frequently using day and night by dentists and continuing dental education programs can be accentuated amongst dental communal for hazards of these chemicals and encouraging the dental communal that definite consistent procedures essentially recognized for

the material of this type or certain substitute must be used for the advantage and protection of their healthiness.

MATERIAL & METHODS

This was a cross sectional study conducted in the Department of Prosthodontics at Isra Dental College, Hyderabad, over the period of five months, from June, 2019 to October, 2019. The study was approved by ethical committee (Iu/DN (FD)/IDC/2019/641).

The study contained 50 participants included Prosthodontist specialists, general dental practitioners and dental students.

The contributors were requested to fill an online self-administrated questionnaire concerning the use of auto polymerised poly methyl methacrylate resin (Self cure acrylic) and the allergic reactions of this material. Also taking the informed consent for the confidentiality purpose of participant's identity kept confidential.

Data was analyzed by SPSS version 21. Descriptive statistics such as frequency distribution, percentage were included in Data analysis. The significance level was established at <0.05%.

RESULTS

Out of 50 participants, 64% were dental students, 26% general dental practitioners, 10% were Prosthodontist specialist (Figure-1). 13% participants used precautionary measures such as goggles, masks and gloves, masks where as 30% used antihistamines along with masks, gloves and goggles. 33% contributors did not even usage of some preventive procedure for allergic reaction (Table-I). Out of 50 participants, 24 participants were using chemically cured auto-polymerised Poly Methyl Meth Acrylate for 1-5 years of a time duration, 16 contributors were using for 6-10 years wherever this material using for more than 10 years by only 10 participants (Table-II).

Out of 50 participants, 22% has no any allergic reaction occurs where as 45% has allergic contact

dermatitis (Skin reaction), 15% suffered from sinusitis after breathing of monomer vapours of liquid, in eyes, allergic reactions were 10% and shortness of breath found in 8% (Table-III).

Only 15 participants had no any allergic reaction. 10 participants out of 50 total participants acquired medical treatment and accessed the consultant for their allergic responses and stopped usage auto polymerised Poly Methyl Meth Acrylate while 25 participants did not acquire any medical treatment and accessed the doctor but still they could not remain using the auto polymerised PMMA material (Table-IV).

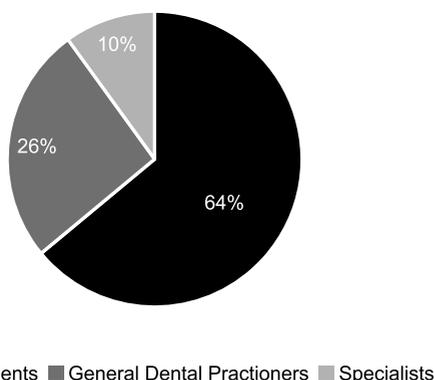


Figure-1. Percentage of participants and their qualification

Protocols Used by Participants	Percentage of Participants
Only gloves, masks and goggles	13%
Antihistamines along with gloves, masks and goggles	30%
No protocol	33%
Not Allergic	24%

Table-I. Percentage of protocols used by participants

Duration of Use	No. of Participants
1-5 years	24
6-10 years	16
More than 10 years	10

Table-II. Duration of use of poly methyl meth acrylate resin by participants

Allergic Organs	Percentage of Contributors
Skin	45%
Sinuses	15%
Eyes	10%
Respiratory tract	8%
No allergy	24%

Table-III. Organs affected by allergy

Medical Treatment Acquired	No. of Participants
Treatment acquired and not using auto polymerised PMMA	10
Treatment not acquired but not using auto polymerised PMMA	25
Not allergic	15

Table-IV. Medical treatment acquired by participants

DISCUSSION

In dentistry, as in other profession have pros and cons in their surroundings. Many materials in dentistry have risks of internal breathing or interface with numerous vapours and metals that can ready to allergic effects. Study conducted by Aalto Korte et al¹⁶, which showed that the usage of various types of methyl methacrylate cause adversely exposed allergic effects. Study showed that the 5 dental consultants, 8 dental professionals and 15 dental medical protectors assembled evidence of 12 years. A review study done by Rai Ret al¹⁷, which shown that 7 dental professionals formed skin allergic reaction (contact dermatitis) after patch testing occurs with various materials containing (MMA) mono methyl methacrylate. In our current study, 45% contributors revealed skin allergic reactions within 1-5 years of a duration, 15% established sinusitis, 10% members to eyes and 8% established respiratory tract symptoms.

Another study done by Linsdtrom M¹⁸, which showed that the 22 years usage of mono methyl methacrylate cause extensive effects of hypersensitive conjunctivitis and respiratory tract related symptoms in general dental practitioners whereas another review study did not revealed enormous consequences from gastro intestinal tract, respiratory tract or nervous system.¹⁹ In study of Khan AA, Siddiqui AZ et al²⁰ illustrates skin allergic effects 24.3%, 5.4% reactions to eyes and 0.9% respirational symptoms in several time period.

In present study we establish that 33% of participants did not developed any concord to avoid adversely vulnerable reactions while former review shown that most of the members were not informed about the correct application that would be taken.¹⁹ In current study 13% members established protocols like gloves, goggles and

masks whereas the another study showed on extreme number determined that 66 contributors never developed beyond concords, just 12 were developing frequently and 15 contributors in commonly developed.²⁰ Use of acrylics as hazards are being increasing day by day so it is important to have a firm check and balance on it. In fact current study was complete on a minimum population though studies are being conducted on methyl methacrylate related hazards, it comprises apprehension to construct definite new choices to this substantial so that reduced its use in dentistry.

CONCLUSION

It was concluded that out of 50 participants, maximum contributors had allergic effects to the skin while many of them did not acquired medical treatment or services and did not followed any practices to avoid further reactions.

In addition, education and awareness essentially be given to increase awareness amongst the lab technicians and dental students as well that how to protect from the probable harmful side effects produced by poly methyl meth acrylate materials and must be followed the essential protocols and precautions.

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AUTHORSHIP AND CONTRIBUTION DECLARATION

No.	Author(s) Full Name	Contribution to the paper	Author(s) Signature
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2	Rabia Chandio	Data collection, Literature search and Critical Revision.	
3	Rafia Khan	Literature search, Data Entry and Referencing.	
4	Saud Ahmed	Data collection, Literature search and editing.	
5	Belal Soomro	Data collection, Literature search and referencing.	
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