

## Knowledge and Attitude of Dentists Regarding Platelet Derived Regenerative Modalities in Dentistry

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### Abstract

**Introduction:** Regenerative dentistry is an emerging field of medicine involving stem cell technology. This cross-sectional survey was done to evaluate the knowledge, awareness and attitude of dentists regarding Platelet derived growth factor (PDGF) as a Regenerative Modality.

**Materials and methods:** Online close ended questionnaire based survey was conducted in Maharashtra pertaining to Knowledge, Awareness and Attitude of the dentists about platelet derived regenerative factor (PDGF). A questionnaire consisting of 29 questions about knowledge, awareness and attitude about PDGF was circulated among the dentists.

**Results:** About 267 participants responded to the questionnaire survey. Among the participants 28.5% were male and 71.5% were female. Majority of the participants were at age of 20-30 years (70.8%), BDS participants were 56.6% and 97.4% participants had awareness about PDGF.

**Conclusion:** There is high awareness about PDGF as a treatment modality amongst the dentists.

**Keywords:** Knowledge, Awareness, Attitude, Platelet derived growth factor.

### Introduction

Regenerative dentistry is an emergent field of medicine containing stem cell technology, growth factors, scaffolds. Platelet derived growth factors (PDGF) are extensively applied as a

bioactive scaffold in cell-based therapy and tissue engineering. The most important growth factors released by platelets in PRP and PRF include vascular endothelial growth factor (VEGF), transforming growth factor- $\beta$  (TGF- $\beta$ ), platelet-derived growth factor (PDGF), fibroblast growth factor (FGF), hepatocyte growth factor (HGF), epidermal growth factor (EGF), insulin-like growth factors 1 and 2 (IGF-1 and IGF-2), and interleukin. Bioactive molecules play significant parts in different applications of regenerative medicine, including bone remodeling, wound healing [1]. Activated platelet-derived factors assist as regulators and messengers that effect a diversity of cell-cell and cell-extracellular matrix (ECM). Platelet-rich fibrin is an autologous source of platelet-derived growth factor and transforming growth factor [2].

PDGF has gained increasing popularity in the medical field, especially in regenerative dentistry, including regenerative endodontics, periodontics (treatment of infrabony periodontal defects and periodontal plastic surgery), and oral and maxillofacial surgery [1]. Inchingolo et al stated that, PRF has significant role in implant-prosthetic rehabilitation [3].

The wide array of applications of PDGF in the field of Dentistry, makes it essential for dental practitioners to have knowledge about the method of preparation of PDGFs, clinical applications and advantages, disadvantages. Hence, the purpose of present study was to evaluate the knowledge and attitude of practicing dentists regarding platelet derived growth factor modalities in dentistry.

## Materials and Methods

The present cross sectional descriptive close ended questionnaire based online survey was conducted from September to November 2015 to October 2016. The study protocol was reviewed and approved by the Institutional Review Board of Ethics of Pravara Institute of Medical Sciences, (DU). The survey was carried out to assess the knowledge, attitude, and practice of Indian dentist regarding the Platelet Derived Growth Factor. The questionnaire was designed by referring the literature related to similar survey. The necessary modification was made based on the face validity conducted on faculty of Rural Dental College. The final questionnaire consisted of twenty-nine questions in which Part A consists of 6 questions regarding sociodemographic variables and Part B consists of 23 questions about awareness and attitude. The survey population encompassed dentists belong to or practicing in Maharashtra, India. A total of 267 dental private practitioners as well as academicians from dental colleges within Maharashtra responded.

The questionnaire data were entered into Microsoft Excel 2010 by the investigator. The statistical analysis was done with SPSS version 20 software (SPSS Inc., Chicago, IL, USA). The Person's Chi square test and percentages of the total were used for analysis to gain insight into the knowledge, awareness and attitude.

## Results

**Table 1: Demographic data about PDGF**

### Characteristics

Age (years)	% of Participants
20-30	70.8%
31-40	22.1%
Gender	% of Participants
Male	28.5%
Female	71.5%
Area of Work	% of Participants
Academics	64.9%
General Practice	18.7%
Speciality Practice	8.0%
Qualification	% of Participants
BDS	56.6%
MDS	34.1
Awareness about PDGF	% of Participants
Yes	97.4%
No	2.6%

A total of 267 dentists completed the questionnaire survey, of which 28.5% were male and 71.5% were female. Majority of the participants were at age of 20-30 years (70.8%), BDS participants were 56.6% and 97.4% participants had awareness about PRF (Table1)

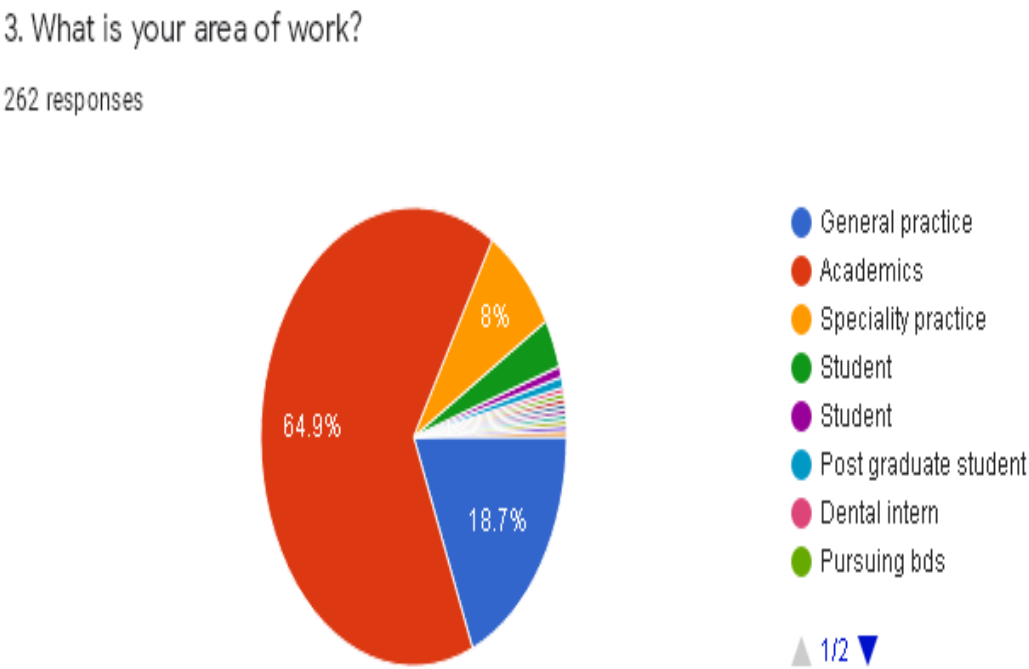
**Table 2: Source of Information**

Source of Information	% of Participants
Professional Associations	43.3%
Scientific Journals and Magazines	41.8%

Academic Books	39.9%
Social Media	14.4%
Commercial Companies	0.8%
Word of Mouth	15.6%

Table 2 indicates information resources.

**Graph 1 shows the demographic characteristics of participants**



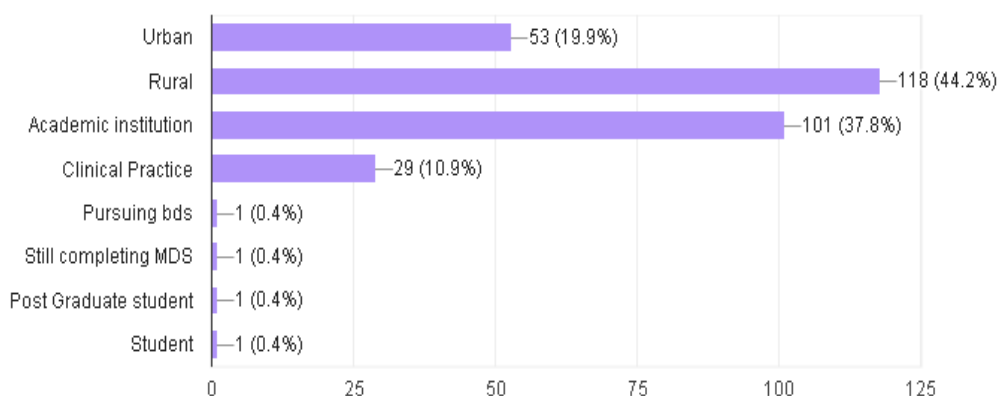
Graph 1 shows the demographic characteristics of participants. Majority of participants (70.8%) were between 20 to 30 years age.

Maximum respondents (64.9%) were academicians, followed by practitioners (18.7%) and dental specialty practice (8%). The work experience of maximum respondents (72%) was less than 5 years, 15.7% were having experience of 5 to 10 years followed by 12.2% of them with more than 10 years. 56.6% of respondent were BDS graduates whereas 34.1% were MDS post graduates.

## Graph 2: data regarding the location of practice

6. Where is your primary place of practice located?

267 responses

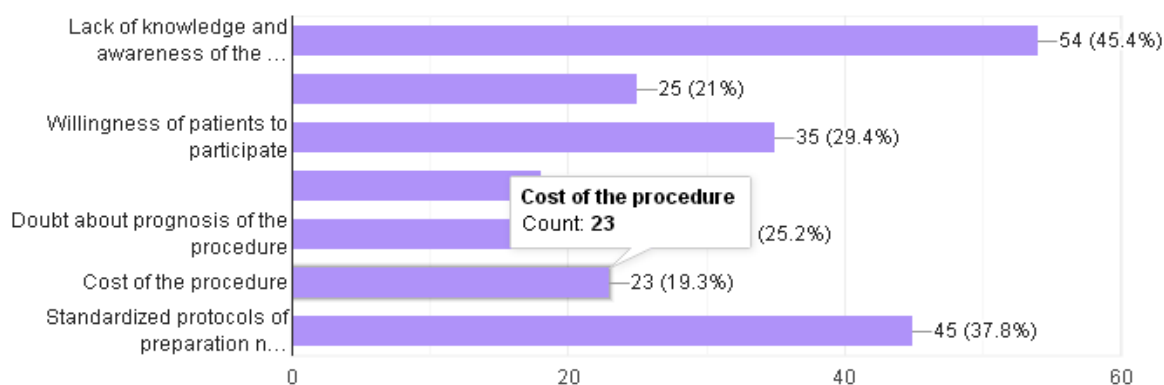


The data regarding the location of practice revealed that maximum of the respondents were practicing in rural areas 44.2% followed by academic's institutions 37.8% and urban region 19.9% (Graph-2).

## Graph 3: Barrier in application of PRF

16. What is the main barrier in the application of PRP/PRF in dentistry?

119 responses



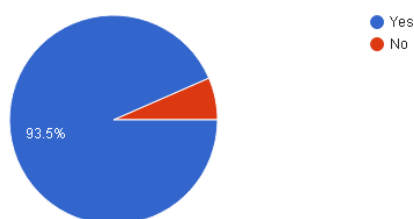
64.3% of respondent considered PDGF as an optimal treatment modality followed by MTA apexification(41.3%) and calcium hydroxide (13.3%). 80.9% of the participants chose PRF as a

treatment modality more often followed only 19.1% chose PRP, while 52.4% already believed there is risk in handling PRP/PRF. (Graph 3)

#### Graph 4: Role of PDGF in treatment modalities

20. Do you think the use of PRP/PRF has significantly altered the treatment modalities in the field of oral surgery, periodontology, implantology and facial esthetics?

245 responses

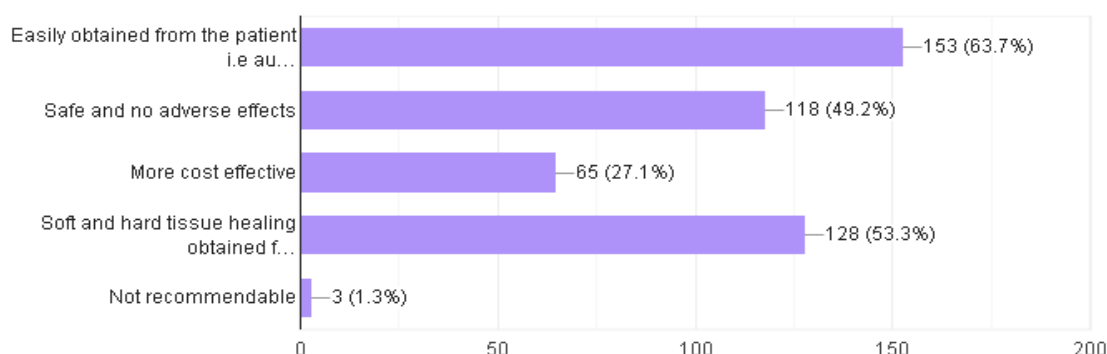


67.9% participants were aware of indications and contraindications of PDGF and 93.5% of them thought that the PDGF has significantly altered the treatment modality in the field of Oral Surgery, Periodontology, Implantology and Facial Esthetics (Graph 4).

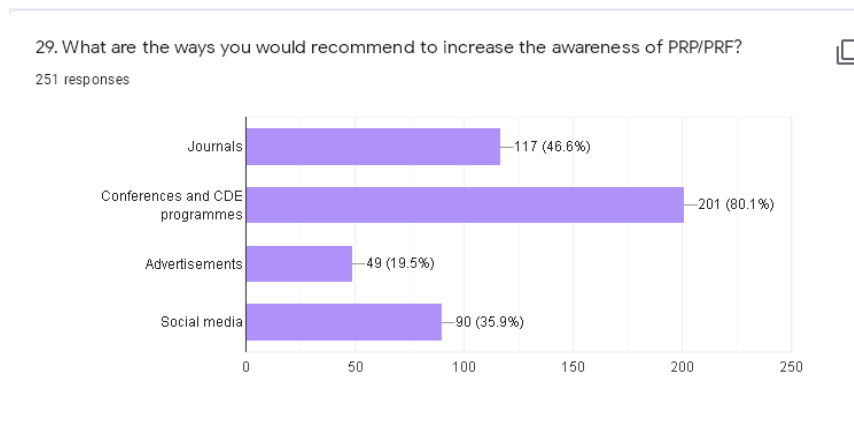
#### Graph 5: PDGF in dental treatment

22. What would be the likely reason to recommend PRP/PRF in regenerative dental treatments?

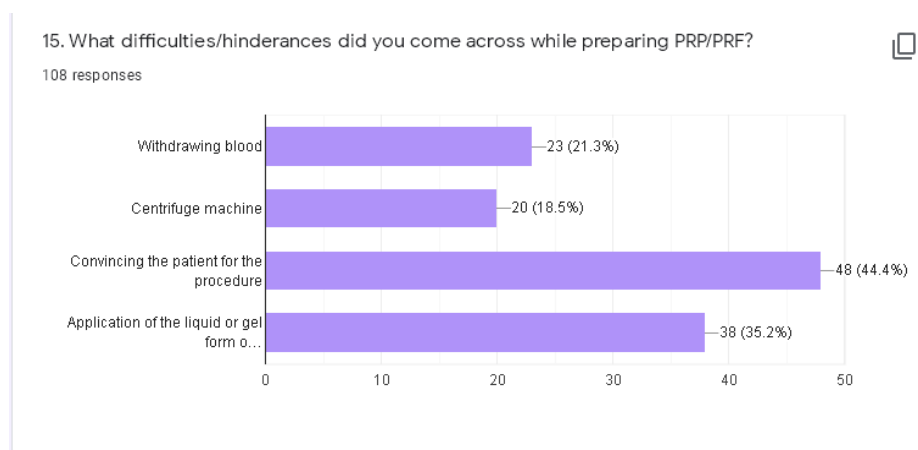
240 responses



According to this survey the 63.7% participant say the most common reason to recommend PDGF is; it is autologous, 53.3% say it fastens healing of soft and hard tissue, it's safe and does not have adverse effects (49.2%) than its cost effectiveness (27.1%) and about 1.3% of the participants would not like to recommend PDGF (Graph 5).

**Graph 6: Awareness about PDGF**

The 98% of the respondents showed an increasing interest in updating their current knowledge on PDGF while 94.3% showed keen interest in attending the training course or the continuing educational program on application of PDGF in dental treatment (Graph 6).

**Graph 7: Difficulties faced in preparing PDGF**

When asked about the difficulties, the 44.4% of the participants said that convincing the patient was major hindrance, 35.2% experienced difficulty in application of the liquid/gel forms of PRP/PRF in patients, 21.3% quoted difficulty in withdrawal of blood, 18.5% say it requires centrifuge machine (Graph 7).

**DISCUSSION**

In recent years' regeneration is gaining importance and valuable weightage; while most of the dentists are going for its applications in dentistry. Among the various growth factors involved PDGFs are at the fast growing pace. Hence, research is more oriented towards processing, obtaining, advantages and disadvantages in regeneration. As this is a recent topic, it may not be included in the dental education curriculum. The knowledge of it is also very scarce.

Stem cells are defined as clonogenic cells capable of both self-renewal and multilineage differentiation. They are also termed as progenitor cells. Similar to our findings Chitroda et al found good level of awareness among the dental professionals [4]. Paknejad et al found that Plasma rich in growth factors (PRGF) to deproteinized bovine bone mineral (DBBM) improved osteogenesis in rabbit calvarias [5].

Lye et al conducted a cross-sectional study using self-administered questionnaire on stem cells attitude and knowledge amongst nursing students. They found more positive attitude amongst the participants [6].

According to the survey, the main barrier in applying PDGFs in dentistry is the lack of awareness among the dentists, nearly about 45.4% dentists lacked the knowledge about PDGF applications, 37.8% did not know its preparation protocols. Also 25.2% attendants showed doubts about the prognosis of PDGF. 29.4% showed that there is lack of patient's willingness to get treated with this treatment modality, 19.3% showed that cost of such treatment also to be one of the hindrances.

Most of the participants (45.7%) suggested that the cost of dental treatment using PRP/PRF should be more than conventional treatment and 44% suggested it should be equal and 10.3% suggested it should be lesser. The 98.2% of the participants believed PRP/PRF treatment modality is successful. 67.8% of participants believed that there are ethical concerns with the use of PRP/PRF.

Mayya et al evaluated the level of knowledge, attitude, and perception (KAP) amongst dentists related to regenerative endodontics and observed that, 65% had a positive attitude, and only 21% had a positive perception about Regenerative Endodontic Procedures (REPs). Most of the participants (86.5%) were of the opinion that regenerative therapies should be a part of dentistry. Majority of the participants (89.6%) were motivated to obtain training in REPs. They concluded that endodontists have a positive attitude concerning the use of regenerative therapies [7]. Katge et al assessed Knowledge and attitude of Indian dentists regarding dental stem cells. They concluded that, awareness, knowledge regarding sources, applications, uses and clinical research guidelines regarding dental stem cells is lacking amongst most dentists [8]. Utneja et al observed that half of the participants (52.6%) were already using some type of regenerative therapy in their clinical practice; however, with a majority of these limited to use of membranes, scaffolds or bioactive materials [9]. Goyal et al concluded that study participants have poor knowledge, attitude, and practice regarding regenerative endodontics. Endodontic specialty has a significant effect on the attitude of study subjects [10].

The knowledge and awareness regarding PDGF can be increased through conferences, scientific journals, advertisement, social media, by conducting workshops on preparation protocol. Amongst all, the maximum number of participants (80.1%) recommended spread of awareness of PDF through Conferences and CDE programmes, 46.6% suggested publications of



journals, 35.9% suggested use of social media while only 19.5% suggested the use of advertisements.

The survey showed that the major hindrance in performing PDGF as a treatment modality is convincing the patient as the patient is totally unaware of this new treatment modality.

As majority of participants experienced that the convincing the patient was major hindrance in application of PRP/PRF due to the patient's fear about blood withdrawal procedure, there is dire need to motivate the patients about advantages of PDGF. It can be achieved by increased advertisement about applications and importance of PDGF, mouth to mouth publicity, through posters and hoarding, educating the patients. Promoting the use of PDGF will definitely lead to increased application and it will also increase the patient's demand which will increase the scope of PDGF.

## Conclusion

It is concluded from the survey that there is good awareness about PDGF as a treatment modality amongst the dentists but there is lack of knowledge about preparation protocol of PDGF and also there is a need to increase the awareness amongst the patients to make the PDGF treatment modality as a great success.

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