Uses of platelet-rich plasma in dentistry: What’s the confusion about?

Sirs,

The ultimate goal of any oral therapeutic procedure is to protect and maintain the patient's natural dentition for his or her lifetime. A recent innovation in dentistry is the preparation and use of platelet-rich plasma (PRP), a concentrated suspension of the growth factors found in platelets. These growth factors are involved in wound healing and are postulated as promoters of tissue regeneration. PRP is a new application of tissue engineering, biotechnology and a rapidly developing area for clinicians and researchers today. In real terms, PRP is just a volume of autologous plasma that has a platelet concentration above baseline. It is a storage vehicle for growth factors, especially which primarily influence bone regeneration. Because of its newness, there is a potential for misunderstanding, misuse, and application of what the practitioner may incorrectly think is PRP. Moreover, since this is an autologous preparation, any concerns regarding disease transmission and immunogenic reactions regarding allograftic and xenograftic preparations can be eliminated.

In implant dentistry, the most important application of PRP would definitely be to accelerate autogenous grafts used for site preparations, sinus lifts, osseointegration, ridge augmentations, etc. However, till date, no positive clinical benefits have been documented in the literature citing these phenomena, with the use of PRP with non-vital bone substitutes. Thus, the whole target of PRP remains applicable to basic osteoprogenitor and stem cells. Additionally, well-enhanced bone regeneration can be anticipated when PRP is used with mixtures of autogenous bone with recombinant human growth factors such as recombinant BMP. However, early results are very promising when PRP is placed in the preparation site of a dental implant specifically in the maxilla, in areas of previous failures, in the osteoporotic woman, etc.

Marx and coworkers performed the first and most compelling study available on the use of PRP in combination with bone grafts. They propounded that grafts combined with PRP showed twice the graft maturity index calculated from a subjective radiographic assessment over the positive control sites, i.e., cancellous cellular marrow grafts. In general, healing proceeds by repair and regeneration after any surgical procedure; however, it does not fully restore the architecture or function of the affected unit. After surgery, platelets begin to form a stable blood clot, releasing a variety of growth factors that induce and support healing and tissue formation. Administration of these growth factors may be combined with tissue regeneration techniques in the repair of intrabony defects, furcations, and cyst cavities. A recently developed procedure can be used to create PRP that has been demonstrated to induce healing and regeneration of tissues, including those in the surgical area. Although the growth factors and the mechanisms involved are still poorly understood, the ease of applying PRP in the dental clinic and its beneficial outcomes, including reduction of bleeding and rapid healing, holds promise for further procedures. This letter is an attempt to grab the attention of researchers to this novel materialistic aspect of dentistry and authors look forward for some new-fangled studies using wider parameters to authenticate and establish certain concrete guidelines in this perspective.

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Sir,

Teeth play a vital role in the maintenance of a positive self-image and outlook that is why event of loss of teeth results in considerable disabilities, which can intensely interrupt social activities and quality of life. World Health Organization has clearly reported that “people rarely visit the dentist and only in the event of pain, as oral rehabilitation is restricted to the necessity.”[1]

Complete edentulism is the end result of a multifactorial process involving biological factors and patient-related factors. It is the major problem in the developing countries and is widely spread in the current population although the prevalence is declining and incidence of tooth loss is decreasing in the developed nations like India.[2,3]

The overall rate of total edentulism is said to be increasing in developing countries chiefly due to the high prevalence of periodontal diseases and caries. This relative non-homogeneous allocation and prevalence of complete edentulism between developed and less developed countries is frequently associated with interrelated interaction between cultural, individual, attitude, behavior, dental attendance, etiopathogenesis of edentulism, access to care and socio-economic factors.[4]

However, this dilemma has also been tackled meticulously in the developing nations including India where its prevalence varies from 60% to 69% of 25 years and above age group, whereas 30% of edentulism is commonly seen in the age group of 25 years.[5] This seems to be directly associated with the number of lost teeth, which increases with age, leading to an increase in prevalence edentulous patients. Furthermore, complete edentulism is on the rise in Indian populace predominantly due to inappropriate oral hygiene and tobacco-chewing habits. It generally strikes post 45 years of age and is classified as a physical handicap by the World Health Organization because it severely negatively affect speech, chewing ability, and normal facial structure.

In this modern era, the individual's attitude towards tooth loss is rapidly changing that solely includes greater expectations of their dental health than in the past. Literature has evidenced a number of non-pathologic associated with these conditions such as attitude, behavior, characteristics of the health care system, economical and occupational status.[6]

In spite of the fact that implant-supported complete denture provide immense improvements in implant-related surgical/prosthetic predictability, increased long-term clinical success, and enhanced patient education and acceptability for replacing missing dentition, conventional removable dentures continue to represent the first rehabilitative option offered to the edentate in many places around the World including Indian province. However, it restore only ten percent of chewing ability and lead to jaw bone degradation, whereas implant-supported/retained dentures can restore from 60 to 80 percent of chewing ability and patients do not experience any bone shrinkage. So, considering the overall state of affairs, it seems imperative for the leading dental practitioners in all populations around the Globe to gradually shift and modernize their conventional therapeutic philosophies what they offer and deliver to their completely edentulous patients.

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