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Intralesional Platelet-Rich Plasma in the Treatment of Oral Lichen Planus: Review Article

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ABSTRACT

Background: a lingering disease of inflammatory type called oral lichen planus (OLP) affects the oral mucosa. It can be presented at one of the following forms: ulcerative, erosive, hyperkeratotic and reticular form. Patients usually feel discomfort, burning sensation, pain and changes of the life quality. Mostly it affects women of middle ages and to a lesser extent affects children. There are many therapeutic modalities in treatment of OLP but mostly no effective results are obtained and patient satisfaction is poor and recurrence occurred. Intralesional platelet-rich plasma is used to treat erosive dermatological lesion, it depends on its high concentration of growth factors that prompt healing.
Objective: To study the effect of intralesional platelet-rich plasma in the treatment of oral lichen planus.
Conclusion: Intralesional platelet-rich plasma is a good and safe modality for treatment of oral lichen planus.
Keywords: Oral lichen planus, Platelet rich plasma, Intralesional.

INTRODUCTION

Middle- aged adults are the most common population who suffer from lichen planus subtype that affects mucosa, which is called oral lichen planus (OLP) [(1)].

Pain is the most frequent symptom affects OLP patients, in addition to other manifestations that include hyperkeratotic plaques, erythema of mucosa, ulcerations and erosions. The reticular type may be asymptomatic [(2)].

OLP may have immunologic background in the form of immune response-mediated, autoimmune response, and nonspecific mechanisms [(3)].

Treatment aims at relieving symptoms, decreasing risk of scaring from erosive lesions, decrease rate of recurrence and risk for malignant transformation [(4)].

Intralesional platelet-rich plasma:

Platelet-rich plasma (PRP) is defined as plasma that is condensed and contains high concentration of platelet-derived growth factors (PDGF) [(5)]. PRP have an autologous function, hence to promote healing of any damaged part of the body through its direct injection. Theoretically, lower percentage of complications or side effects tend to occur because it belongs to the same personnel own blood [(6)].

Several growth factors are released, which facilitate the therapeutic function of PRP. These growth factors include: Keratinocyte growth factor (KGF), platelet-derived growth factor AB (PDGF-AB), vascular endothelial growth factor (VEGF), insulin-like growth factor 1 and 2 (ILGF), transforming growth factor β1 (TGF β1), epithelial growth factor (EGF), fibroblast growth factor (FGF), and connective tissue growth factor (CTGF) [(7)]. Interleukin 8 (IL-8) chemokine facilitates circulation, blood flow and angiogenesis, which is one of PRP components beside the other previous mentioned growth factors [(8)].

When the injured part of the body being injected with PRP, healing occurs through release process of platelet activation through the previous factors within the platelet themselves. Vitronectin, Fibronectin and Fibrin are 3 protein components of PRP, which play important role in epithelial migration as they act like cell adhesion molecules and act as connective tissue matrix [(9)].

Preparation

PRP approaches varies greatly in terms of sample collection, rotation force, and centrifugation details like quantities and duration, in addition to quantities and types of platelet activators. The outcomes and quality of preparation is affected by some factors like the time interval between activation of PRP and application [(10)].

PRP is collected by one of 2 common methods:

1) Conventional: Because the ingredients and equipment are all obtained separately, this procedure is similar to typical laboratory methods for blood collection and processing [(11)].
2) Device or prepackaged Kits: Some firms provide kits with specially constructed containers and modified centrifuges with preset timings suited for extracting PRP from whole blood. It results in greater platelet counts than conventional approaches [(12)].

The next step in preparing PRP is centrifugation; several centrifugation procedures have been described. These approaches can be categorized into 2 main ways: Single centrifugation and double centrifugation, which are two methods of separation [(13)].

Pérez *et al.* did a ten minutes initial centrifugation at 723 rpm, then the second for ten minutes at 1445

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rpm, which resulted in tripling the basal level of platelet concentration [14]. Single centrifugation for ten minutes at 1500 rpm was suggested by **Gomez *et al.*** [10] to gain platelet concentration 1.6 to 4.9 times of the baseline values with decreasing handling with the specimen to minimize loss o the platelets and preventing their contamination.

Following centrifugation, the blood components shown in the figure are ordered by density in the order shown, from the base to the mouth of the tube: the red series (with the highest density), the white series, platelet-rich plasma (PRP), and platelet-poor plasma (PPP), all having a lesser density [12].

To activate it, chemical compounds like thrombin, calcium chloride or calcium gluconate, calcium chloride 10% solution in a 1:20 ratio are utilized [10].

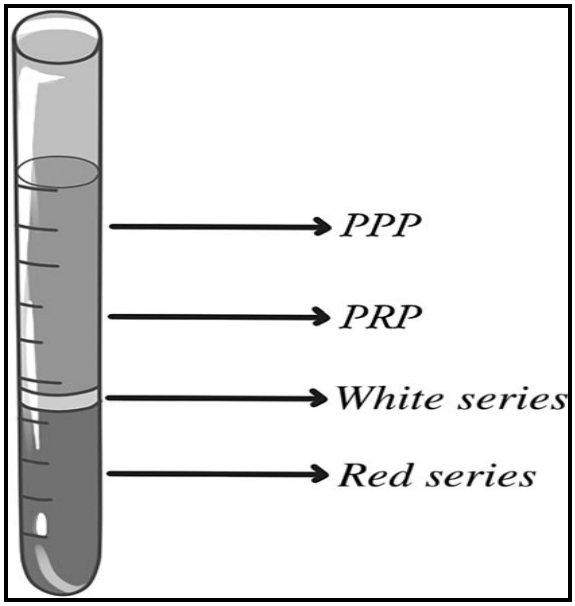

Figure (1): Cellular component division following citrated blood centrifugation **(12)**

Platelet rich plasma in oral lichen planus:

Pinas *et al.* [15] stated that PRGF (plasma rich in growth factors) has been shown to be useful in the treatment of atrophic-erosive lesions of the OLP that are resistant to corticosteroid therapy. Biomolecules produced from growth factor-rich plasma may complement specific growth factors and molecules that may be insufficient at the location of the lesion.

Indication of PRP in dermatology:

Facial rejuvenation, facial wrinkles, striae distensae, androgenetic alopecia, alopecia areata, scars, vitiligo, and synergistic effect with fractional CO2 for reducing Wrinkles and acne scars [16].

Contraindications to the Use of PRP: [17]

- Absolute contraindications include:
  Platelet dysfunction syndrome, critical thrombocytopenia, hypofibrinogenemia, hemodynamic instability, septicemia.
- Relative contraindications:
  Continuous utilization of nonsteroidal anti-inflammatory medications (NSAIDs) in forty-eight hours after the procedure, injection of steroids at site of processing, or administering steroids by injection within 14 days of the procedure. Besides, recent fever or illness, rash at graft donor site or at receptor site, cancer especially hematopoietic or of bone, HGB < 10 g/dl, and platelet count less than 105/μL.

CONCLUSION

Intralesional platelet-rich plasma is a good and safe modality for treatment of oral lichen planus.

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