

ORIGINAL ARTICLE

The Role of Platelet-Rich Plasma Injection in the Treatment of Oral Lichen Planus Patients.

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ABSTRACT

Background: Oral lichen planus (OLP) is a mucosal variant of lichen planus disease which generally influences women more than men, it is characterized by more chronic course and potential for multiple recurrence. The aim of the work was to study the effect of intralesional injection of platelet-rich plasma (PRP) in the treatment of OLP.

Methods: This therapeutic trial study included 18 patients with OLP collected from the outpatient clinic of Dermatology, Venereology & Andrology Department of Zagazig University Hospitals, each of them had 5 sessions of intralesional PRP injection 2 weeks interval in between.

Results: All our patients were greatly improved after PRP sessions. This improvement was evaluated using reticulation/keratosis, erythema, and ulceration (REU) scoring, and photographic assessment. Fortunately, almost all our patients had no side effects to mention after PRP injection, nor any recurrence within 3 months after completing their sessions.

Conclusions: PRP injection is an effective method in treatment of OLP.

Keywords: Oral lichen planus (OLP); Platelet-rich plasma (PRP); Reticulation/keratosis, erythema, and ulceration (REU) scoring.



INTRODUCTION

Oral lichen planus (OLP) is a chronic immune-mediated disease that affects the oral mucosa. It is reported that the worldwide prevalence rate of OLP in adult population is almost 0.5–2.2%. The malignant transformation rate of OLP influenced tissues is reported as 1.09% [1].

There are several types of OLP, the most common of which are reticular type (which is mainly characterized by presence of a symptomatic papules and whitish striae affecting the oral mucosa called Wickham's striae), ulcerative/erosive type (this variant is always associated with variable degrees of pain, erythema, discomfort and bleeding), atrophic type, papular and bullous types (which are considered as less common forms of OLP) [2].

The classic presentation of OLP is mainly bilateral, symmetrical pattern in the buccal mucosa, which is the most typical site of involvement however, any other oral mucosal sites can also be involved like tongue, gingiva, and labial mucosa [3].

The etiology of OLP is mainly unknown, but there are many predisposing factors that may have a role in its pathogenesis like, genetic background,

psychological factors, trauma, systemic diseases, and HCV virus [4].

Although many therapeutic lines are used for treatment of OLP, its complete treatment is still challenging. The first line is topical corticosteroids which may permit good results, but they have multiple side effects and not all cases respond to it so, this drives us for the detection of other sorts of therapies [5].

Other lines used are biologic agents or natural agents such as curcumin, aloe vera, and vitamin A and laser, but topical steroids are faster and more effective option in the treatment of OLP [6].

Platelet-rich plasma (PRP) is a concentration of human platelets, it is three to five times greater than the physiologic concentration of platelets in the entire blood. Now PRP is used in different medical fields, there is increased interest in using PRP in dermatology. It has been used in different applications as wound healing, tissue regeneration, scar rejuvenation and alopecia [7].

Platelets are considered a rich source of important growth factors, such as platelet-derived growth factor (PDGF), transforming growth factor- β (TGF- β) 1 and 2, and vascular endothelial growth factor (VEGF); all of these are incorporated in the process of new blood vessels formation which

helps in the healing of various types of tissues, and recalcitrant wounds, so platelets are one of the first cells to be activated at a wound site, and have a vital role in the initiation of its healing [8]. The aim of the work is to evaluate the effect of intralesional injection of PRP in the treatment of OLP.

METHODS

Setting: This study was carried out in Dermatology, Venereology & Andrology Department of Zagazig University Hospitals during the period from February till December 2019.

Patients: The study included 18 patients collected from the outpatient clinic of Dermatology, Venereology and Andrology Department after the approval of Institutional Review Board (IRB) at Zagazig University.

Inclusion criteria: Patients were diagnosed clinically as having OLP disease whatever having other skin lesions or not. Patients who did not receive any topical or systemic treatment for OLP during the previous one month prior to the study. Patients were selected from any age and both sexes.

Exclusion criteria: Patients with oral lichenoid reaction due to dental materials or systemic medications. Smokers. Patients with recurrent oral infections, receiving chemotherapy or immunosuppressive medications. Pregnant and lactating females. Patients with severe anemia, pancytopenia, and patients with bleeding tendency. Patients with skin diseases other than LP.

Ethical Approvals: A written informed consent was obtained from all participants, the work has been carried out in accordance with The Code of Ethics of the World Medical Association (Declaration of Helsinki) for studies involving humans.

Procedures: All patients were subjected to: Detailed history taking. Screened for HCV infection and their liver function through doing HCV antibodies test, liver function test, CBC, and Bleeding profile. Complete general and dermatological examination especially examination of the buccal mucosa including site, size, number, and type of OLP lesions. Pain and burning sensation were assessed according to VAS with the grading of (0–10) in this system no burning sensation was counted as 0, and severe burning sensation was counted as 10. Patients were diagnosed as having OLP by using the clinical criteria of the modified World Health Organization (WHO) for diagnosis of OLP. Scoring of OLP lesions was done according to Reticulation/erythema/ulceration scoring system (REU), which is a semi-quantitative scoring system used for monitoring OLP lesions response to treatment.

Methods: Eighteen patients with OLP (11 females and 7 males) their ages ranged from (30-65) years

were injected with 5 sessions of PRP. Schedule: Once every 2 weeks up to 5 sessions.

Preparation of PRP: Double spin method was used, 10ml of blood was collected from each patient into tubes containing trisodium citrate. The collected blood was firstly centrifuged for 10 minutes at room temperature to separate the red blood cells at the bottom of the tube from the plasma above (soft spin), then the upper plasma was obtained, and another centrifugation (hard spin) was done to get a platelet pellet in the lower part of the tube, and platelet poor plasma (PPP) in the upper part. The (PPP) was partly removed to finally produce 2ml of platelet rich plasma, then we activated it by adding 10% calcium chloride (0.1 ml of calcium chloride was added to every 0.9 ml of human platelet rich plasma) [8].

Technique of injection: Injection was done with local anesthesia at 4 points at the periphery of each lesion 0.5 ml PRP at each point (superior, inferior, 2 lateral sides) using a 26-gauge needle, the total volume of the injected PRP in every session ranged from 2-4 ml according to the affected area.

Evaluation of the patients:

REU scoring: In this scoring system, the oral cavity was divided into 10 sites: the left buccal mucosa, the right buccal mucosa, the dorsal surface of the tongue, the ventral surface of the tongue, mandibular part of the gingiva, maxillary part of the gingiva, the floor of the mouth, hard palate, soft palate, the tonsils, and the labial mucosa (upper and lower lips together) [9].

Reticular/hyperkeratotic: 0=no white striations and 1=presence of white striations or keratotic papules. Erosive/erythematous: 0=no lesion, 1=lesions <100 mm², 2=lesions from 100 to 300 mm², and 3=lesions >300 mm². Ulcerative: 0=no lesion, 1=lesions <100 mm², 2=lesions from 100 to 300 mm², and 3=lesions >300 mm². Total: $\sum R + \sum (E \times 1.5) + \sum (U \times 2.0)$.

Physician and photographic assessments: Physician assessment was done by comparing the photographs of the patients before and after completing the treatment using 16-megapixel camera.

Follow up of the patients: We followed our patients up for 3 months after completing the course of treatment to detect any recurrence of OLP in them. Fortunately, there was no recurrence in any one of our patients.

Statistical analysis: Data were fed to the computer and analyzed using IBM SPSS software package version 20.0. (Armonk, NY: IBM Corp) Qualitative data were described using number and percent. The used tests were Chi-square test, Fisher's Exact or Monte Carlo correction, Student t-test, Mann Whitney test and Correlation analysis.

RESULTS

The present study included 18 patients with OLP, their ages ranged from 30-65 years, 9 of them were complaining from burning sensation, 4 from discomfort, 2 from pain and 2 from bleeding, 9 patients had a history of hepatitis c virus (HCV), and 12 of them had no associated cutaneous lesions but 6 had cutaneous lesions of the popular type of LP in their arms and legs. The highest distribution of OLP lesions was in cheeks, but the lowest distribution was in lips, the commonest variant of OLP in our patients was the erosive type and less commonly was the reticular type as shown in table (1).

Therapeutic response: Both erosive and reticular types of OLP were greatly improved after 5

Table (1): Distribution of the studied patients according to site, type, duration of the disease (n = 18).

Oral lesions	No.	%
Site		
Cheeks	12	66.7
Tongue	4	22.2
Lips	2	11.1
Type		
Erosive	12	66.7
Reticular	6	33.3
Duration (month)		
Min. – Max.	0.25 – 12.0	
Mean ± SD.	2.57 ± 3.42	
Median (IQR)	1.0(0.5 – 3.0)	

sessions of PRP injection 2weeks interval in between as shown in table (2). This improvement was evaluated using REU scoring, mean was 7.73 ± 3.12 before treatment and becomes 1.03 ± 0.77 after treatment. Fortunately, almost all our patients had no side effects to mention after PRP injection.

Physician assessments of the patients: Case 1 fig (1) and case 2 fig (2) show the stages of OLP healing after our PRP sessions, all the patients had a good response after injection. The part (A) of each figure shows the patients before injection, where part (B) was taken after 3 sessions of PRP injection, and part (c) shows great improvement of the patients with disappearance of reticulations and erosions respectively after completing the 5 sessions of PRP injection.

Table (2): Comparison between patient's REU scoring before and after PRP injection (n=18).

REU score	Before	After	Z	P
Min. – Max.	5.0 – 16.0	0.0 – 2.0	3	0
Mean ± SD.	7.73 ± 3.12	1.03 ± 0.77	.423*	.001*
Median (IQR)	6.50(5.5 – 10.0)	1.0(0.5 – 1.8)		

Z: Wilcoxon signed ranks test. **p:** p value for comparing between the studied periods. **REU:** reticulation, erythema, ulceration. **.*:** Statistically significant at $p \leq 0.05$



Figure (1): A case of reticular type of OLP shows reticulations and Wickham’s striae in the buccal mucosa in part (A) before injection, while part (B) was taken after 3 sessions of PRP injection where the number and the size of the stria started to decrease, part (C) shows great improvement of the patient after 5 sessions of PRP injection



Figure (2): A case of erosive type of OLP present on the lower lip of HCV positive female, part (A) shows bleeding and multiple erosions was present on the lip before injection, part (B) shows excellent improvement with disappearance of bleeding and ulceration after 3 sessions of PRP injection, but white reticulations were still present, in part (c)there was complete healing of the lesions after 5 sessions of PRP injection

DISCUSSION

Oral lichen planus (OLP) is a chronic resistant illness that influences the oral mucosa, with a 1.09% malignant change rate in the influenced tissues.

According to **Al Hashimi et al.** [3] the reported female/male sex ratio is 2 to 1 and the age of onset is generally between 30 and 60 years old and this is coinciding with our study where 61.1% of patients were females and 38.9% of patients were males, their ages were between 30 and 65 years old. **Al rashdanet al.** [4] proposed that the etiology of OLP is mainly unknown, and that HCV may have a role in its pathogenesis, and this was accepted in our study where HCV seropositivity was reported in 38.9% of patients.

Oral lichen planus (OLP) is estimated to occur in 70 to 77% of patients with cutaneous LP according to **Farhi et al.** [9], in our study most cases 66.7% had no cutaneous lesions, 22.2% of them had lesions in legs and only 5.8 % had lesions in arms which were papular in type.

According to **Al-Hashimi et al.** [3] and **Eisen et al.** [10] the classic presentation of OLP is mainly in the buccal mucosa which is the most typical site of involvement however, other oral mucosal sites can also be involved like tongue, gingiva and labial mucosa, and less commonly affected sites are like floor of the mouth and upper lip, in our study 66.7% of lesions were in cheeks, 22.2% of them were in the tongue and 11.1% were in lips, **Eisen et al.** [10] also reported that reticular type of OLP is the most common clinical subtype, but in our

work 66.7% of our patients had erosive type and 33.3% only had reticular type.

However, 50% of our patients were complaining from burning sensation in the buccal mucosa, only 10% of patients were complaining from pain and bleeding and these symptoms are coinciding with the typical symptoms of OLP according to **Eisen et al.** [10].

Treatment of OLP is a must because of its tendency to malignant transformation, in this study, we tried to evaluate the effect of PRP in treatment of OLP as a new option because PRP was proved to have good effects in treatment of many dermatological diseases as it is considered a rich source of GFs like (PDGF), (TGF)- β and (FGF) which have angiogenic, mitogenic and chemotactic effects that accelerate the healing of ulcers and erosions [11,12].

In our study there was great improvement in all OLP patients injected with PRP as shown by the highly statistically significant difference in the REU scoring of patients after completing the course of injection without any noticeable side effects from the procedure, and this was shown as complete healing of the erosions and ulcers in most cases, disappearance of erythema, white lines, pain, bleeding and discomfort in most cases.

These results were also shown in **Mergio et al.** [12] and **Martínez-Zapata et al.** [13] studies where they elucidated the vitality of PRP role in the oral and maxillofacial fields, in wound healing and chronic skin ulcers treatment, they also dissected the safety of PRP injection procedure and concluded that, PRP is a safe procedure with no

proven side effects, this is coinciding with our results where none of our patients complained from any side effects after injecting PRP in their lesions.

CONCLUSIONS

This study provides further evidence on the importance of PRP as an excellent option in the treatment of chronic erosions and ulcerations.

REFERENCES

- 1- Van der Meij EH, Mast H, van der Waal I. The possible premalignant character of oral lichen planus and oral lichenoid lesions: a prospective five-year follow-up study of 192 patients. *Oral Oncol* 2006;43(8):742–8.
- 2- Cheng YS, Gould A, Kurago Z, Fantasia J, Muller S: Diagnosis of oral lichen planus: a position paper of the American Academy of oral and maxillofacial pathology. *Oral Surg Oral Med Oral Pathol Oral Radiol* 2016;122(3):332–54.
- 3-Al-Hashimi I, Schifter M, Lockhart PB, Wray D, Brennan M, Migliorati CA et al. Oral lichen planus and oral lichenoid lesions: diagnostic and therapeutic considerations. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 2007; 103 (Suppl: S25) e21–12
- 4- Alrashdan MS, Cirillo N, Cullough MC. Oral lichen planus: a literature review and update *Arch Dermatol Res* 2016; 308:539–51.
- 5- Thongprasom K, Prapinjumrune C, Carrozzo M. Novel therapies for oral lichen planus. *J. Oral Pathol Med* 2013; 42, 721–7.
- 6- Gupta S, Ghosh S, Gupta S. Interventions for the management of oral lichen planus: A review of the conventional and novel therapies. *Oral Dis* 2017, 23, 1029–42.
- 7- Dhillon RS, Schwarz EM, Maloney MD. Platelet-rich plasma therapy-Future or trend? *Arthritis Res. Ther.*2012; 14, 219.
- 8- El-sharkawy H, Kantarci A, Deady J, Hasturk H, Liu H, Alshahat M et al. Platelet-rich plasma: growth factors and pro- and anti-inflammatory properties, *J Periodontol* 2007;78(4):661-9 .
- 9- Farhi D and Dupin N. Pathophysiology, etiologic factors, and clinical management of oral lichen planus, part I: facts and controversies. *Clin Dermatol.* 2010; 28(1):100–8.
- 10- Eisen D, Carrozzo M, Bagan Sebastian JV, Thonogram k. Number V oral lichen planus: clinical features and management. *Oral Dis.* 2005; 11(6):338–49.
- 11-Montero EC, Santos MF, Fernández RS. Platelet-rich plasma: Applications in dermatology. *Actas Dermosifiliogr* 2015 *Actas Dermo-Sifiliográficas (English Edition)* 2015; 106(2), 104-11.
- 12.Mergio E, Oppici A, Parlato A, Cella L, Clini F, Fontana M, et al. Platelet-rich plasma (PRP) rinses for the treatment of non-responding oral lichen planus. *Biomedicine* 2018; 6- 15.
13. Martínez-Zapata MJ, Martí-Carvajal A, Solà I, Bolibar I, Angel Expósito J, Rodríguez L, García, J. Efficacy and safety of the use of autologous plasma rich in platelets for tissue regeneration: A systematic review. *Transfusion* 2009; 49(1), 44–56

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