



PLATELET RICH- PLASMA (PRP) IN SYMPTOMATIC DRY EYE OF DIABETIC PATIENTS: A CROSS- SECTIONAL STUDY

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ABSTRACT **BACKGROUND-** Dry Eye Syndrome is more prevalent in diabetic patients. Diabetic retinopathy and DES appear to have common association. To evaluate the effectiveness of autologous platelet rich- plasma (PRP) in symptomatic dry eye of diabetic patients. **METHODS-** The present study was conducted to evaluate the efficacy of platelet rich plasma in patient with diabetic dry eye. The study was conducted in the department of Ophthalmology, Sardar Patel Medical college and associated group of hospital, Bikaner. All patients received platelet rich plasma four times daily for one month and follow up. **RESULTS-** Redness, Dryness, Foreign Body sensation, Burning, Eye mucus and crusting, Blurred vision improvement after treatment was found statistically significant. In schirmer test our study showed 13 eyes had grade 1, 40 eyes had grade 2, 27 eyes had grade 3, 20 eyes had grade 4 in test value. After treatment eyes showed improvement which was statistically significant. And in tear film break up time test we also graded the eyes according to TBUT before starting the treatment. 100 eyes had grade 2. After treatment improvement was found statistically significant. **CONCLUSION-** The overall results shows that PRP improved signs and symptoms in the majority of patients, and good tolerance is confirmed by the fact of that all the patients requested continued use of this treatment.

KEYWORDS : PRP, Dry eye, Clinical outcome.

INTRODUCTION

Dry Eye Syndrome is more prevalent in diabetic patients. Diabetic retinopathy and DES appear to have common association. In fact, examination for dry eye should be an integral part of the assessment of diabetic patients.¹ The relationship and association between diabetic retinopathy and Dry eye syndrome is not well documented in India except few studies done in New Delhi and Jammu.^{2,3}

PRP obtained from total unclogged blood is very rich in platelets and growth factors, including platelet-derived angiogenesis factor, platelet-derived growth factor, platelet derived epidermal growth factor and platelet factor IV, and others that emulate physicochemical properties of natural tears.⁴ PRP had shown improvement in ocular surface regeneration, in cases of micropunctate keratitis, decrease inflammation, accelerate and stimulate wound healing processes and may also have a lubricant effect. PRP is also more efficient than total plasma serum in these functions.⁵

There are few studies using PRP in dry eye,⁶ and none, to the best of our knowledge, in diabetic dry eye patients specifically. Patients with diabetes exhibit, in addition to vascular alterations, modifications in blood, as shown in recent studies. A prothrombotic milieu consisting of hyper reactive platelets produce a tight and rigid clot structure which is due to upregulation of coagulation factors and prolongation of clot lysis.⁷ Considering this fact, this study represents a first approach to evaluate the use of PRP as an alternative treatment of symptomatic diabetic dry eye, unresponsive to conventional treatment.

MATERIAL AND METHOD

Type of study- Prospective, nonrandomized, observational consecutive study

Sample size- 100 patients

Sample technique- Simple random sampling

This is a prospective, nonrandomized, observational consecutive study. We recruit 100 diabetic patients at Department of ophthalmology Sardar Patel Medical College, and associated group of hospitals, Bikaner, and informed consent of the patients taken. They evaluating for use of systemic medication and eye drops, other clinical or ocular diseases and previous ocular surgeries. Dry eye severity is established by the Dry Eye Workshop (DEWS) severity scheme, and patient examination including best spectacle corrected visual acuity (BSCVA) measuring by Snellen charts, cornea and conjunctiva staining, lacrimal meniscus height, signs of meibomian glands dysfunction, keratitis, other bio-microscopic alterations, tonometry, funduscopy, Schirmer test and Break up time test (BUT).

We evaluate the severity of the perceive symptoms, analyze by their frequency, using the classical symptoms of dry eye: dryness, itching or foreign body sensation, burning, redness, blurred vision and mucus or crusting.

INCLUSION CRITERIA -for PRP treatment-patient with diabetic dry eye reporting in OPD in ophthalmology and unresponsiveness or a weak response to conventional treatment, having at least a frequent or constant symptom and either a Schirmer test at less than 15mm or a BUT less than 10 seconds.

AN EXCLUSION CRITERIA -patients that have keratopathies, use of glaucoma eye drops and previous rheumatic disease diagnosis. We also exclude patient that have contraindicated conditions to autologous donation (congestive heart failure, severe aortic stenosis, heart attack or stroke in the last 6 months, angina, cyanotic disease, infection or antibiotics use.

DATA ANALYSIS- Data was recorded as per Performa. The data analysis was computer based; SPSS-22 was used for analysis. For categoric variables chi-square test was used. For continuous variables independent samples's *t*-test was used. *p*-value <0.05 was considered as significant.

RESULTS

60.00% patients were from more than 60-80 Yrs age group followed by 28.00% patients 40-60 yrs age and 12.00% patients were more than 80 Yrs age group. 72.00% patients were male and 28.00% patients were female. Mean BMI was 25.50±2.86 kg/m². Mean Fasting blood sugar was 170.73±48.50 mg/dl, PP blood sugar was 271.91±73.52 mg/dl and Hb1Ac was 8.40±1.31%.

Table 1. Outcome wise distribution of study subject

Clinical profile(Grade)	Before treatment	After PRP treatment	p-value
Dryness (1:2:3:4)	0:7:93:0	27:52:21:0	0.01
Redness (1:2:3:4)	19:20:61:0	19:68:17:0	0.01
Foreign body sensation (1:2:3:4)	8:92:0:0	20:52:28:0	0.01
Blurred vision (1:2:3:4)	7:93:0:0	20:68:12:0	0.01
Burning (1:2:3:4)	8:92:0:0	21:66:13:0	0.01
Eye mucus and crusting (1:2:3:4)	21:59:20:0	21:79:0:0	0.01
Schirmer I & II (1:2:3:4)	13:40:27:20	32:68:0:0	0.01
BUT (1:2:3:4)	0:100:0:0	73:27:0:0	0.01

1: schirmer variable or normal, 2: schirmer ≤ 10mm, 3: schirmer ≤ 5mm, 4: schirmer ≤ 2mm

BUT : break up time, 1: variable or normal, 2: ≤ 10 seconds, 3: ≤ 5 seconds, 4: immediate

Dryness, redness, **Foreign body sensation, Blurred vision, burning, Eye mucus and crusting, Schirmer I & II, Break up time** improvement after treatment was found statistically significant.

DISCUSSION

This is a prospective, nonrandomized, observational consecutive study. We recruit 100 diabetic patients at Department of ophthalmology Sardar Patel Medical College, and associated group of hospitals Bikaner, and informed consent of the patients taken. We evaluating for use of systemic medication and eye drops, other clinical or ocular diseases and previous ocular surgeries. Dry eye severity is establish by the Dry Eye Workshop (DEWS) severity scheme, and patient examination including best spectacle corrected visual acuity (BSCVA) measuring by Snellen charts, cornea and conjunctiva staining, lacrimal meniscus height, signs of meibomian glands disfunction, keratitis, other bio-microscopic alterations, tonometry, funduscopy, Schirmer test and Break up time test (BUT).

We evaluate the severity of the perceive symptoms, analyze by their frequency, using the classical symptoms of dry eye: dryness, itching or foreign body sensation, burning, redness, blurred vision and mucus or crusting.

Dry eye treatment is difficult due to the multifactorial nature of this condition. A number of treatments can be used depending on the etiopathogenic factor and the severity of this disease: artificial lubricants, topical steroids, topical immunosuppressants, mucolytics and secretagogues, as the most common.⁸²

The revolution of treatment for dry eye was the autologous serum⁸³ and recently, the PRP.

PRP is a major source of growth factors, with more advantages than serum. Studies shows that it has more properties for stimulating corneal reepithelization and simulates better the human tear.⁸⁻¹² It is a preservative-free biological product, with the benefit of being obtained from the patient's own blood. When all sterile procedures are followed and guaranteed, the risk of infection and contamination of the bottle and ocular surface is minimal.

In the present study, we obtained preliminary results concerning the efficacy of PRP for dry eye in diabetic patients. Other studies had evaluated the use of PRP in dry eye of different etiologies. The results about the symptoms indicate that PRP is efficacious in diabetic patient with moderate to severe dry eye. We evaluated each symptom individually.⁸

Treatment with PRP in the present study showed improvement in symptoms of dryness, itching, redness, and burning in all patients with statistical significance. The improvement in these symptoms most likely occurred because of an indirect reduction of inflammation, by decreasing tear osmolarity and the dilution of proinflammatory factors in the ocular surface; and because of inhibitors of inflammation, such as the interleukin-1 receptor antagonist and inhibitors of metalloproteinases⁵ and other important growth factors, which are known to participate in corneal reepithelialization.⁷

CONCLUSION

The overall results shows that PRP improved signs and symptoms in the majority of patients, and good tolerance is confirmed by the fact of that all the patients requested continued use of this treatment.

It can therefore be concluded that PRP is an interesting alternative therapy in symptomatic diabetic dry eye. In clinical practice, it is important because it may prevent complications of dry eye and improve patient well being. More clinical trials are required to create specific guidelines regarding the concentrations and treatment protocols.

LIMITATION OF STUDY

Limitations of this study are the small sample size that may lead to compromised statistical analysis. In addition, there may exist other etiologic factors involved in our cases: hormonal factors, use of medication that also could cause dry eye and the possibility that non diagnosed diseases could contribute for this condition in addition to diabetes mellitus.

Possible limitation of this technique is that some diabetic patients can have difficulties in venipuncture because of their vascular alterations, as we observed in our study in four patients.

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