Case Report

Efficacy of Platelet-Rich Plasma (PRP) in a Patient with Optic Nerve Atrophy: A Case Report

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ABSTRACT

Optic atrophy is one of the alarming conditions with no promising treatment. In clinical practices, Platelet-rich plasma (PRP) is widely used for nerve regeneration in this era. A 5-year-old female patient presented in Al-Ibrahim eye hospital with the complaint of headache and painless decrease in vision for 3 years. Ocular examination showed that best corrected visual acuity hand motion (HM) in the right eye. All the other vital sign in their normal range. After the bio-microscopic examination it was observed that the anterior segments were exceptionally intact in both eyes with a slight sluggish pupillary reaction in the right eye and increased intraocular pressure of 10mmgh in both eyes. 0.05ml plasma rich platelete with recombinant human nerve growth factor was given to the patient. After the 6th injection, visual acuity improved from HM to 6/24 with changed disc colour.

Key Words: Optic atrophy, Plasma-rich platelet, Nerve regeneration

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INTRODUCTION

Nerve regeneration mainly depends on the restoration of nerve axons as well as marinating the functional activity of the myelination process. The network of synaptic field and their functional capacity restoration is an important part of the recovery phase of any nerve injury[1]. Now a day the usage of platelet-rich plasma makes valuable importance in treatment of optic nerve injuries. Visual impairment is one of the major health problems, and researchers are trying to gather evidences for the treatment of visual impairment. The plasma that contains platelets can be obtained from the blood sample of the same patient. The plasma is composed of many growth factors and growth stimulating factors that play remarkable effects in healing the tissue and restoring nerve injury[2]. The monolayer of cell that is present between the Bruch's membrane and photoreceptors of pigmented layer of retina.[3,4]

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The objective of this experiment was to evaluate the effectiveness of platelet-rich plasma in the restoration of visual impairment by stimulation underlying various growth factors in the cellular microenvironment.

CASE

A 5-year-old female patient presented to the pediatric department of Al-Ibrahim eye hospital with complaints of headache and painless decrease of vision for 3 years. She had previous history of viral infection 3 years back which was associated with Fever which later subsided with treatment (according to her mother). Visual loss was painless, acute in onset and there was no history of increased intra ocular pressure (IOP). Ocular examination revealed her best corrected visual acuity (BCVA) Hand motion in the right eye and 6/6 in left eye.

During the early examination, patient showed normal vital signs with complete consciousness and well oriented to time. Unremarkable anterior segments in her both eyes were observed during the bio-microscopic examination except for the sluggish pupillaryreaction in right eye and intra-ocular pressure (IOP) of 10 mmHg in either eye. On fundoscopy with +90D volk lens revealed right eye optic disc margins appear sharp and the disc was pale in color and about two disc diameter with orange color in the left eye. Fundus photos were recorded (Figure no:1) and advised Visual evoked potential (VEP), which revealed severe optic nerve pathway dysfunction in the right eye.

Unfortunately, there is no proven treatment for such type of optic atrophy. The patient was given intra-vitreal platelet-rich plasma injection (0.05ml) in the right eye under sterile conditions in the operating room

at one-month interval for 6 months. Her visual acuity improved from HM to 6/24 (after 6th injection) and changes appeared in disc colour (figure no:2).

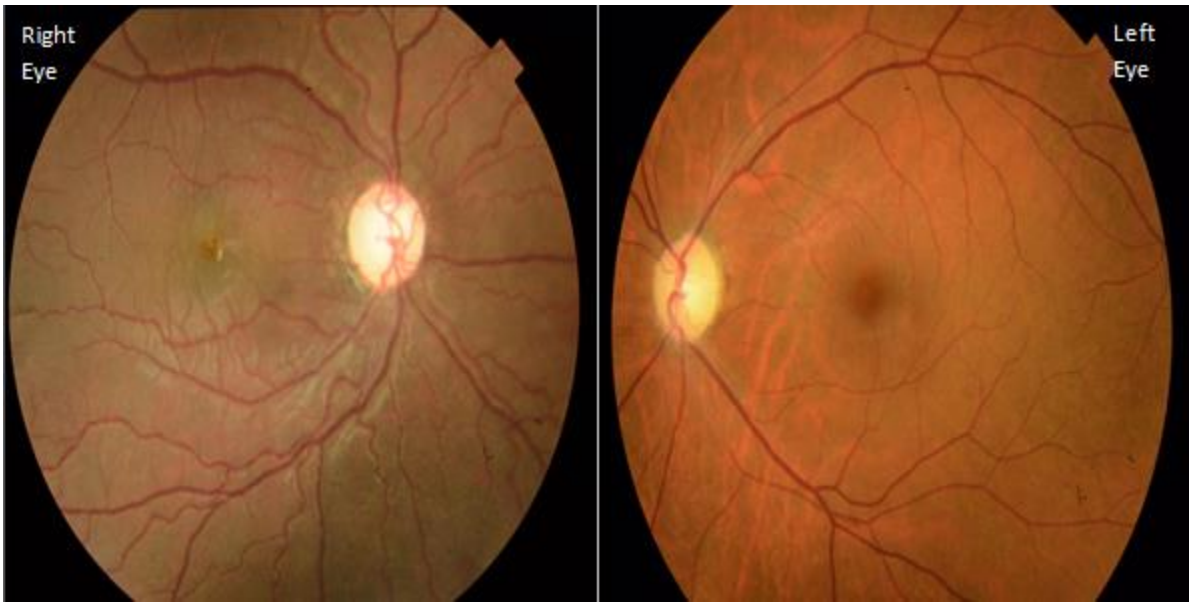

Figure No.1: Before treatment Right and Left Eye

Figure No.2: After treatment Right and Left Eye

Preparation of PRP: This is a cost effective method of preparing PRP.

Patient blood is used to obtain PRP for the treatment in OT

*The required amount of patient's own whole blood is drawn with 5cc syringe which contains 10% volume of anticoagulant (CPDA) the ratio should be 0.05ml of anticoagulant into 1ml of patient's whole blood.

*The anticoagulant blood is then transferred to sterile empty test tube.

*The time and speed of centrifugation is set on:

1. Preparation of Platelet-Rich Plasma yields a three to four-minute light spin (2000g).
2. Relative centrifuge force (in g) was calculated through the following formula:

RCF(in g)= 28.38 × radius of centrifuge motor in inches × (rpm 1000) ²

Centrifuge the whole blood to separate RBCs. After that three layers appeared first upper layer contains the WBCs, intermediates a buffy layer contains the platelets and the bottim layer contains RBCs. Separate the buffy layer which has most of the PPP (platelets poor plasma)

DISCUSSION

According to the study, the platelet-rich plasma was induced to recover the muscular injury, with application of plasma the growth factor enhance the protein synthesis that helps in muscular tissue repairing same as in present study the plasma works in restoration of optic nerve damage[5,6]. According to the results of another study, the author concludes the numbers of regenerative nerve fibers in the distal segment, after implementation of plasma-rich platelets in peripheral nerve restoration. Similar regenerative status was found in the present study[7]. There is one of the best evidence-based conclusions was given by Arslan U et al: after using subtenon injections of plasma rich platelets for the treatment of retinitis pigmentosa and statically proven the positive results with long term follow-up[8,9]. Application of plasma-rich platelets as a therapeutic agent in one of the case was reported to restore the leprosy induced neuropathy and significant positive effects were observed same as in present case the generative mechanism of plasma on degenerative nerve effects[10.11].

Author's Contribution:

Concept & Design of Study:	Asif Mashood Qazi
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Revisiting Critically:	Asif Mashood Qazi, PS Mahar, Sadia Bukhari
Final Approval of version:	Asif Mashood Qazi

Conflict of Interest: The study has no conflict of interest to declare by any author.

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