ORIGINAL RESEARCH PAPER

Ophthalomology

KEY WORDS:

THE STUDY OF THE ROLE OF PLATELET RICH PLASMA AS AN ADJUVANT THERAPY IN COMPARISON WITH CONVENTIONAL THERAPY IN CORNEAL OPACITY

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INTRODUCTION

- In the early 1940s clinicians used extracts of growth factors and cytokines for healing .The term platelet rich plasma was first used in1954 by kingsley and in 1960 the first Platelet Rich Plasma blood bank were established, becoming popular by the 1970s.
- In the 1970s PRP was used in the field of haematology for transfusions to treat thrombocytopenia,PRP is prepared by taking blood from the person and then putting it through two stages of centrifugation designed to separate Platelet rich plasma from Platelet poor plasma and red blood cells(1).
- Platelets, also known as thrombocytes, are small cytoplasmic fragments derived from bone marrow megakaryocytes.
- Platelets contain over 800 proteins and molecules, comprising cytokines, chemokines, membrane proteins, metabolites, messenger molecules, growth factors (GFs) and numerous soluble proteins. As a result, besides their role in coagulation and hemostasis, platelets are also involved in vasoconstriction, inflammation, immune response, angiogenesis and tissue regeneration and consequently, they participate in numerous physiological signaling mechanisms and are related to multiple pathologies(2,3).
- Corneal opacity defines as loss of normal transparency of cornea due to scarring. Causes are congenital opacities may occur as developmental anomalies or following birth trauma, healed corneal wounds , healed corneal scars.
- Clinical features are loss of vision, blurred vision, glare , photophobia , lacrimation .
- Grades of corneal opacity(4,5,6)-

CORNEAL OPACITY	DIFFERENTIATING POINTS
NEBULAR CORNEAL OPACITY	Faint opacity due to superficial scar involving bowman's layers and superficial stroma.
MACULAR CORNEAL OPACITY	Semi dense opacity when scarring involves about half of the corneal stroma
LEUCOMATOUS CORNEAL OPACITY	Dense white opacity due to scarring involves more then half of corneal stroma
ADHERENT LEUCOMA	It occurs when healing occurs after perforation of cornea with incarceration of iris

- Conventional therapy in corneal opacity are Topical Lubricants and Antibiotics, Steroids which is utilized to rebuild and re-epithelize corneal tissue due to its properties as aerobic metabolism and oxidative phosphorylation activator.
- PRP obtained through centrifugation of non-coagulated complete blood. Its biochemical composition is serum, leukocytes, platelets and growth factors platelet-derived growth factors (PDGF), transformation growth factor-beta (TGF-BETA), insulin-like growth factor (IGF), fibroblastic growth factor (FGF), vascular endothelial growth factor (VEGF) and epidermic growth factor (EGF) which carry out to the function of regenerating the substrate(7,8).
- PRP eye drops are proving to be an effective and potent therapeutic approach to promote corneal reepithelization.

AIM AND OBJECTIVE

- The study of the role of platelet rich plasma as an adjuvant therapy in comparison with conventional therapy in CORNEAL OPACITY
- To study the clinical outcome associated with this intervention.

MATERIAL AND METHODS

Place of Study- study was conducted in the Department of Ophthalmology, Career Institute of Medical Sciences and Hospital, Lucknow, U.P.

Study Interventions Whole blood is obtained by venipuncture in acid citrate dextrose (ACD) tubes. The blood should not be chilled at any time before or during platelet separation.The blood is centrifuged using a 'soft' spin (1500rpm).The supernatant plasma containing platelets is transferred into another sterile tube (without anticoagulant) the tube is centrifuged at a higher speed (a hard spin or 2500rpm) to obtain a platelet concentrate. The lower 1/3rd is PRP and upper 2/3rd is platelet-poor plasma (PPP) at the bottom of tube platelet pellets are formed is removed and the platelet pellets are suspended in a minimum quantity of plasma (2-4 mL) by gently shaking the tube and diluted to 20% (v/v) with a sterile saline solution(9,10).

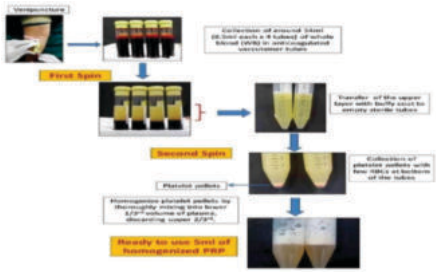
The final preparation was divided into 5-mL bottles The patients were instructed to store theses bottles at -20 degree Celsius until use. Bottles being used were maintained under refrigerated condition at 4 degree Celsius(11,12).

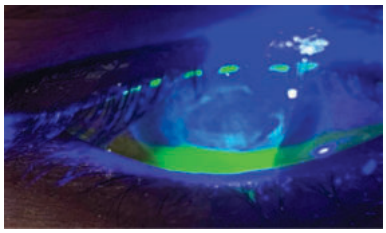
Group A(Interventional group)- Conventional therapy was given along with platelet rich plasma as an Adjuvant. GroupB (Control group)- Only Conventional therapy was given.

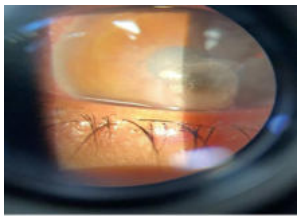
Study Design- Hospital based Comparative study.

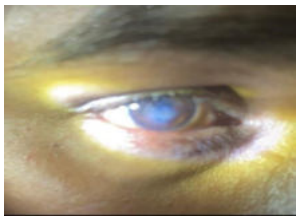
Group A(Interventional group)- Conventional therapy was given along with platelet rich plasma as an Adjuvant.

GroupB (Control group)- Only Conventional therapy was given.









Inclusion criteria-

1- All patient with corneal opacity
2- 18 years and above.

Exclusion criteria-

1- Patient under 18 years of age.
2- Patient with hemodynamic instability (Hypertension, Congestive heart failure, Arrhythmias.)
3- Patient with history of chronic kidney disease and chronic liver failure.
4- Patient with history of chemical burns(13,14).

Study sample size-

Sample size estimation, done on the basis of prevalence of corneal opacity We use the formula:

$n = z2(1-p)/e2$

Where,

Z = value of the standard normal distribution corresponding to a significance level of α (1.96 for a 2-sided test at the 0.05 level / 95% confidence).

p = expected proportion in the population e = absolute precision

Statistical Analysis-

The information was analysed and tabulated using SPSS version 28 software.

The values will be represented in numbers (%)

Method of Data Collection

- Informed consent of study subjects was taken
- Patient was followed up in OPD at Career Institute Of Medical Science And Hospital.
- Patient was examined according to protocol clinically
- Group A Patient (Interventional)

On the first day- Conventional therapy (Topical antibiotics and steroid and topical lubricant was given) Along with the conventional treatment platelet rich plasma was given as an adjuvant.

(Administer 1hrly around the clock for first 48hrs, then decreases to 2hrly during the day and 4hrly at night. Once healing is ensured ,further decrease to 4-6 hrly.(15,16)

Follow up pattern-

1st follow up will be done in	1st week
2nd follow up will be done in	3rd week
3rd follow up will be done in	6th week

Total duration of the treatment: 1.5 months

Group B Patient (Control)

On first day Conventional therapy was given(Topical antibiotics and steroid along with topical lubricant was given) (Administer 1hrly around the clock for first 48hrs,then decreases to 2hrly during the day and 4hrly at night. Once healing is ensured , further decrease to 4-6 hrly.)

Follow up pattern-

1st follow up will be done in	1st week
2nd follow up will be done in	3rd week
3rd follow up will be done in	6th week

Total duration -1.5 months

RESULTS

- Total 52 patient with corneal opacity was taken
- Group A Patient (Conventional and PRP therapy was given)
- Group B (Only conventional therapy was given)
- After 6 week of follow up (Total duration -1.5 months)

Group A (26 patients)	Symptoms	Signs
Improvement (%)	83.3%	31.2%

Group B (26 patients)	Symptoms	Signs
Improvement %	86.6%	32%

DISCUSSIONS

- Corneal opacity defines as loss of normal transparency of cornea due to scarring. Causes are congenital opacities may occur as developmental anomalies or following birth trauma, healed corneal wounds , healed corneal scars.
- PRP obtained through centrifugation of non-coagulated complete blood. Its biochemical composition is serum, leukocytes, platelets and growth factors platelet-derived growth factors (PDGF), transformation growth factor-beta (TGF-BETA), insulin-like growth factor (IGF), fibroblastic growth factor (FGF), vascular endothelial growth factor (VEGF) and epidermic growth factor (EGF) which carry out to the function of regenerating the substrate.
- PRP eye drops are proving to be an effective and potent therapeutic approach to promote corneal reepi thelization.
- Marx RE also explain the difference between Platelet rich plasma and platelet poor plasma
- Conventional therapy is better then PRP therapy for treating corneal opacity(17,18).

CONCLUSIONS

- Conventional therapy is better then PRP in terms of improvement of symptom or sign of corneal opacity.

- PRP has a adjuvant does not show any significant improvement in corneal opacity
- Main stay treatment of corneal opacity is still Keratoplasty, Optical iridectomy, Phototherapeutic Keratectomy(19,20,21).

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