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Efficacy of cord blood transfusion in retinitis pigmentosa: A case report

Dharmesh Chandra Sharma[1], Rakesh K. Gupta[2], Nidhi Agrawal[3] , Poonam Woike[4] , Jyoti Bindal[5]

1 Associate Blood Transfusion Officer (ABTO), Incharge, Blood Bank, Component & Aphaeresis Unit, Department of Pathology, G. R. Medical College, Gwalior.
2 Ophthalmologist, K.V. Memorial Eye Hospital, Gwalior.
3 Resident, Department of Obstetrics & Gynecology, G.R.M.C
4 Resident, Department of Pathology, G.R.M.C.
5 Professor & HOD, Department of Obstetrics & Gynecology, G. R. Medical College, Gwalior, Madhya Pradesh, India.

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***Corresponding author:**

Email : sharmadrdharmesh@gmail.com
Tel.: +91 - 9425111202, 91-751-2630666

ABSTRACT

Retinitis pigmentosa is a group of genetic disorder that affects the retina's ability to respond to light. This inherited disease causes a slow loss of vision, beginning with decreased night vision and loss of peripheral vision resulting in tubular vision. Eventually, blindness results in the affected individual. Regrettably, there is no cure for retinitis pigmentosa till date. Here, we are presenting a case of a 75 years old male who was diagnosed as a case of retinitis pigmentosa when he was 50 years old. He was also suffering from diabetes and asthma. Two units of umbilical cord whole blood were transfused to the patient within an interval of one month. Outstanding improvement was observed in the visual field of the patient along with improvement in diabetes and asthma.

INTRODUCTION

Retinitis pigmentosa (RP) is an inherited disorder characterized by progressive peripheral vision loss and night vision difficulties (nyctalopia) that can lead to central vision loss due to the degeneration of the rod photoreceptor cells in the retina [1]. Retinitis Pigmentosa is characterized by retinal pigment deposits, visible on fundus examination [2]. At the cellular level, this correlates with a predominantly affected rod photoreceptor system. In later stages, the disease may further affect the cone photoreceptor eventually causing complete blindness. [3].The diseased photoreceptors undergo apoptosis, which is reflected in reduced outer nuclear layer thickness within the retina, as well as in lesions and/or retinal pigment deposits in the fundus [4]. Prevalence of non syndromic Retinitis Pigmentosa is approximately 1/4,000. Currently, there is no therapy that stops the evolution of the disease or restores the vision, so the visual prognosis is poor [2]. The therapeutic approach is restricted to slowing down the degenerative process by sunlight protection and vitamin therapy, treating the complications (cataract and macular edema), and helping patients to cope with the social and psychological impact of blindness [5]. Hyperbaric oxygen (HBO) therapy [14] could only play a role in slowing the retinal degenerative process. New approaches for Retinitis Pigmentosa therapies including: cell transplantation therapy [7], gene therapy [8, 9], cytokine therapy [10], nutrition therapy [11, 12, 13], and Retinal Prosthesis [14] are on experimental trial.

AIM

Aim of presenting this case study is to evaluate the efficacy of umbilical whole cord blood transfusion in retinitis pigmentosa.

CASE REPORT

A 75 years old male was diagnosed as a case of Retinitis Pigmentosa when he was 50 years old. At the time of diagnosis his day vision was normal but had defective vision at night. Patient also suffered from asthma and diabetes mellitus. Progressively with age, his vision field got narrowed and at the age of 70 he was totally dependent on others due to tubular vision. At the age of 75, with the recommendation of ophthalmologist two units of umbilical cord whole blood was transfused to the patient with an interval of one month.

MATERIALS AND METHODS

Umbilical cord whole blood was collected in CPDA (citrate phosphate dextrose adenine) 100 ml (make-Terumo penpol) bag

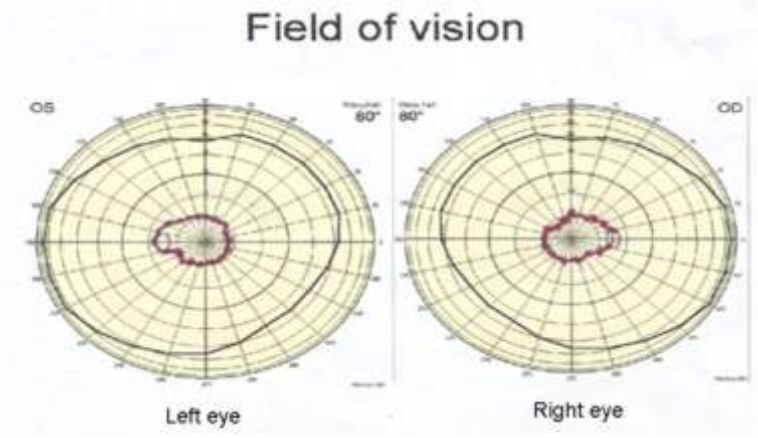

Fig. 1. : Perimetry chart: field of vision (normal vision marked by black line and patient's vision marked by red line) before cord blood transfusion was at around 10-15^{0} fixation point.(03-03-2016)

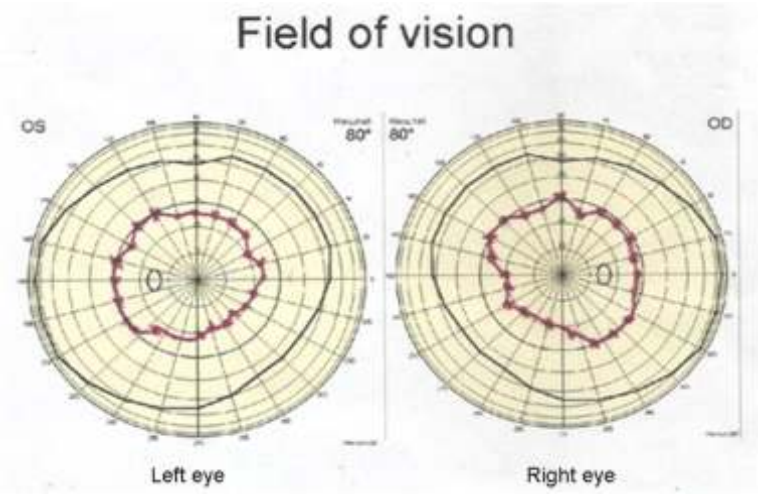

Fig. 2. : Perimetry chart: Field of vision (normal vision marked by black line and patient's vision marked by red line)improved around 300 fixation point after cord blood transfusion.(dated 15-05-2016)

in labour room with all aseptic precautions. Then, unit was transferred to the blood bank where it was tested for ABO, Rh grouping and irregular antibodies along with screening for transfusion transmitted infections (TTI) before transfusion. At blood bank, unit was kept in blood bank refrigerator at 4^{0} C and transfused to the patient within 72 hours of collection.

The patient's blood group was AB + (RhD positive). Two units (80+ ml/ unit) of AB+ umbilical cord whole blood were transfused to the patient with an interval of one month. Units were transfused uneventfully without any immediate/late transfusion reaction.

OBSERVATIONS

After fifteen days of first transfusion, patient's vision area was improved and he was able to visualize doors, windows and stair steps. After second transfusion, his vision area was progressively improved and he was able to do indoor as well as outdoor activities independently even early in the morning when daylight was dim. Visual field of the patient before and after transfusion is shown in the Perimetry chart: Figure No. 1 and 2. His diabetes was remarkably controlled and the patient also got rid of anti-asthmatic drugs after the transfusions.Cord blood transfusion has a hope in the treatment of Retinitis Pigmentosa patients. It helps in recovering the Vision and slows down the progression of the disease in the patient.

DISCUSSION

Presently, there is no definite cure of Retinitis Pigmentosa and conventional therapeutic approach is limited to slowing down the degenerative process by sunlight protection, vitamin therapy, etc [5]. Vitamin A, a possible treatment option to slow down the progression of Retinitis Pigmentosa but the results are not strong. Hyperbaric oxygen (HBO) therapy could only play a role in slowing the retinal degenerative process [6].

Newer experimental approaches are the therapies for future like, 1) Cell transplantation therapy; Attempts at transplanting healthy retinal cells into sick retinas are being made experimentally and have not yet been considered as clinically safe and successful [7]. 2) Gene Therapy; since Retinitis Pigmentosa is usually the result of a defective gene, gene therapy has become a widely explored area for future research [8, 9]. 3) Nerve Growth Factor (NGF); potential therapeutic properties on cells of the visual system [10]. 4) Various nutrition therapies are still under trial [11, 12 and 13]. 5) Retinal prosthesis is also an important area of exploration because the prosthesis, a man-made device intended to replace a damaged body part, can be designed to take

over the function of the lost photoreceptors by electrically stimulating the remaining healthy cells of the retina [14].

In the view of above cited therapies, umbilical cord whole blood transfusion in retinitis Pigmentosa is a therapeutically different approach and results are astonishingly helpful in improving the central vision of the patient. Umbilical Whole Cord blood is safely transfused to the needy patients [15]. As we stated that diabetes and asthma of the patient was also controlled, it means that components of umbilical cord whole blood are very useful in the degenerative, autoimmune and geriatric diseases [16, 17, and 18]. This therapy is simple, cost effective and in the approach of all needy patients.

The main underlying phenomenon related to this improvement is unknown; it might be due to the growth factors, cytokines, stem cells or some other unidentified source present in Umbilical cord blood. Hence, umbilical cord whole blood transfusion might prove useful for the patients suffering from this untreatable disorder and further studies and research need to be done in this area for the benefit of the patient.

CONCLUSION

Umbilical cord whole blood transfusion has shown promising results in the correction of vision in retinitis pigmentosa and is also useful in the degenerative, autoimmune and geriatric diseases. Hence, further work is required on this subject to establish/ contradict our observation.

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