

## Original Article

## Visual Outcome in Diabetic Retinopathy Patients after Pan-Retinal Photocoagulation with Pattern Laser. (Nidek GYC Jixi Model)

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### Abstract

**Objective:** To assess the visual outcome in the patients of diabetic retinopathy after panretinal photocoagulation.

**Method:** Over a period of 11 months, 54 eyes of 26 patients with severe & very severe NPDR and PDR were prospectively followed up. Visual outcome was assessed thrice i.e after one, two and three months follow-up. A prospective interventional study was done at NMDC from Jan 2018 to Nov 2018. Patients have different types of systemic illness like hypertension, connective tissue disorder are excluded for this study.

**Results:** In all groups patients pre treatment level of visual acuity checked. After one month followup few patients decrease their visual acuity and it was due to inflammatory edema caused by laser. After that almost all patients maintained their pre treatment level of visual acuity level. one patient suffer from vitreous haemorrhage and it is most likely due to poor metabolic control.

**Conclusion:** Timely PRP save the vision of patients and prevent it's complications. It also save the patients from permanent Blindness. Pattern laser make the PRP easily and save the time as well as postural problem of patients and doctors.

**Key Words:** Diabetic retinopathy (DR), pan retinal photocoagulation (PRP), Visual outcome.

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### Introduction

Diabetic retinopathy (DR) involves the damage to micro blood vessels in the retina. It results from high blood glucose levels in people with uncontrolled diabetes.<sup>1</sup>

The World Health Organization estimates that more than 180 million people in the world have diabetes mellitus and this number is likely to rise i.e double by year 2030.- Tragically this will lead to approximately 4 million people around the world losing their sight because of DR, the leading cause of blindness in the age group of patients 20-74 years.<sup>2</sup>

PRP is the main stay of therapy for retinal ischemic diseases.<sup>3</sup> It uses Argon blue-green laser. This laser coagulates from choriocapillaris to inner nuclear layer.<sup>4</sup> Patients suffering from type 1 Diabetes Mellitus have more chance of ocular complications. But number of patients with type 1 diabetes Mellitus is less. Most patients belong to Diabetes Mellitus type 2 and major organs at risk is eyes and Kidneys. Although the

whole body is involved. Different studies have shown that control of blood pressure, blood glucose and blood lipids can reduce the risk of diabetic retinopathy and its complications<sup>(5)</sup>. Timely treatment with (PRP) Pan retinal photocoagulation reduce the level of VEGF (vascular endothelial growth factor) and regress the visual threatening complications like Tractional retinal detachment (TRD), Cystoid Macular Edema (CME) and vitreous haemorrhage. PRP is still gold standard of the treatment of the diabetic Retinopathy. Today the pattern laser make the PRP easy. It shorter the time and we can apply maximum burn much easily as compared to the single short PRP lasers. In the study we use pattern laser Nidek GYC 500 JIXI and we use 25 shorts with each press of button.

### Methods

Over a period of 11 months, all consecutive patients with diabetes having severe, very severe NPDR and PDR criteria i.e of ETDRS classification, were inclu-

ded in this study. Thus 52 eyes of 26 patients of both types of diabetes mellitus were included on the basis of convenience sampling. The patients having systemic diseases other than hypertension were excluded. After adequate Dilatation of pupil patient was seated in front of laser delivery mounted slit lamp. Proper dilatation is very necessary because we treat posterior and peripheral retina. In uncontrolled DM pupil difficult to dilate and take time. In this study we use pattern Pan retinal photocoagulation laser (Nidek GYC 500 jixi laser). After putting proparacain (Alcaine) one drop in eye we use volk 145' laser coated lens for photo-coagulation. Laser power setting was 200 to 1200 mW power according to gental white reaction on retina spot size was 200 microne, pulse duration was 0.1 second and distance of burns are one burn width apart. We start PRP from inferior quardrant then make a line of laser burn on the temporal side outside the arcade to prevent laser burn on the macular area. After that we treat inferior half of nasal retina. 2<sup>nd</sup> session of PRP done after one week to treat the superior half of retina. It prevent the major complication like chorodial swelling and cause secondry glaucoma. Usually more than 2000 burns in single session can cause such problem. Then we call the patients after one month ,two months and three months follow up .Visual acuity check on every visit and any complication of laser occur ,it is noted.

**Results**

We divide the diabetic retinopathy patients in 3 groups according to the ETDRS classification. We measure the pre treatment level visual acuity in every group and make follow up after 1 month, 2 month and 3 months. We see that data show decrease of visual acuity in early follow up and after that most of patients maintained their vision of pre treatment level. Except one patient show vitreous haemorrhage and it is most likely due to poor metabolic control of DIABETES.

**Table 1:** Group 1 (Severe NPDR)

Pre laser Visual acuity	FU after 1 month	FU After 2 month	FU after 3 month
20 patientS			
14(6/6)	4(6/9),10(6/6)	14(6/6)	14(6/6)
4(6/9)	4(6/9)	4(6/9)	4(6/9)
2(6/12)	2(6/12)	2(6/12)	2(6/12)

**Table 2:** Group 2 (Very Severe NPDR)

Pre laser visual acuity	FU after 1 month	FU after 2 month	FU After 3 month
15(6/6)	10(6/6)5(6/9)	15(6/6)	15(6/6)
5(6/9)	5(6/9)	5(6/9)	5(6/9)
0(6/18)			

**Table 3:** Group 2 (Very Severe NPDR)

Pre laser Visual acuity	FU after 1 month	FU after 2 month	FU after 3 month
<b>Patients</b>			
4(6/24)	4(6/24)	4(6/24)	4(6/24)
4(6/36)	4(6/36)	4(6/36)	4(6/36)
1(6/60)	1CF(Due to vitreous haemorrhage)	1CF	1CF

**Discussion**

Diabetic Retinopathy is the most common vascular complication in patients with diabetes mellitus. It is also considered as one of the leading cause of the total visual loss.

Diabetic retinopathy is the future challenge for eye specialist. Argon laser is the main stay of treatment. Argon laser is also called permanent ANTI VEGF. In this study we use NIDEK GYC 500 JIXI Model. Patient was selected according to the ETDRS study criteria.

Patient was divided in three groups according to severity of disease. The results are very encouraging regarding Visual acuity, more than 90% were stable. One patient show vitreous haemorrhage. It was due to poor metabolic control. Actually the argon laser converts the ischemic retina into anoxic retina. It decreases the metabolic demand of retina. It permanently decreases the level of VEGF. The long term stability of visual acuity and visual function is depend on the metabolic control of DM. Patients with good metabolic control have less chance of long term decrease of visual acuity (VA) and ocular complications of DM. In this study we do mild scattered PRP (PAN RETINAL PHOTOCOAGULATION) in severe and verysevere NPDR (NON PROLIFERATIVE DIABETIC RETINOL). In severe to very severe NPDR, we apply atleast 3000 shots on retina. In proliferative diabetic retinopathy we apply more than 4000 shots on retina. In case of ischemic increasein future in treated eyes we will do PRP enhancement of up to more than 5000 shots in total. Unlucklythe un-judicial use of Injection Avastin (Bevacizumab) is very high. A large number of ophthalmologist in our country using Anti VEGF (Injection Avastin)in many patients on monthly basis. Although now a days pattern laser make the life easy. In few minutes you can complete the laser session. The patient and doctor compliance is good. Anti VEGF injections are temporarily treatment therapy in mild cases. In high risk patients and severe diabetic Maculopathy, PRP is the main stay and permanent solution of the problem. In present, past and future we cannot deny the importance of argon laser. It prevents the patients from permanent blindness. If it is timely done it prevent the permanent loss of vision in diabetic patients, even in the patients of fluctuating sugar level and nephro-

pathy. It supports the retina because it convert the ischemic retina into Anoxic retina so most patients with good PRP enjoy their vision in their routine activity of life and till the end of their life. It is very important to note here that in patients having good metabolic control of disease the long term results of laser are more encouraging as compared to bad metabolic control.

### Conclusion

Pan retinal photocoagulation is the main stay and gold standard of treatment of hDiabetic Retinopathy. It not only prevents the blindness as well as maintains the visual acuity of diabetes Mellitus 1 and 2 patients. It should be timely done and promote it as a part of standard treatment because most general ophthalmologist use Injection Avastin.

### Conflict of Interest

None

### Funding Source

None

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