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Research Article

A CROSS-SECTIONAL STUDY ON DIABETIC RETINOPATHY PATIENTS WITH ASSOCIATION TO *DAIHIK PRAKRITI*

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ABSTRACT

Diabetic Retinopathy (DR) is a major cause of visual impairment worldwide, primarily resulting from prolonged hyperglycaemia that damages the retinal microvasculature. It is a common complication of both Type I and Type II Diabetes Mellitus and often progresses insidiously until advanced stages, leading to vision-threatening conditions such as macular oedema, retinal hemorrhage, and neovascularization. *Daihik Prakriti* (DP), a fundamental Ayurvedic concept, classifies individuals based on the predominance of *Tridoshas- Vata*, *Pitta*, and *Kapha*. It plays a vital role in predicting disease susceptibility and guiding individualized preventive and therapeutic strategies. **Aim & Objective:** This study aimed to assess the association between diabetic retinopathy and *Daihik prakriti* in Type 2 diabetic patients. **Materials & Methods:** A cross-sectional study was conducted on 40 patients of DR selected from OPD of *Shalakya Tantra* dept at PTKLS, Bhopal. Data was collected using a CCRAS *Prakriti* assessment scale and a detailed dilated examination was done. **Result:** Most patients were aged 61–70 years (47.5%) and male (62.5%), with 87.5% showing uncontrolled diabetes. *Pitta Pradhan Prakriti* was most prevalent (45%), especially the *Pitta-Kapha* subtype (32.5%). **Conclusion:** The findings of this study suggests that there is a significant association between *Daihik Prakriti* and diabetic retinopathy and knowing one's own Prakriti can be an effective diagnostic and predictive tool for early diagnosis, prevention, and management through personalized approach.

INTRODUCTION

Diabetic Retinopathy is major vision impairing complication involving the retinal blood vessels that develop as a consequence of long-term hyperglycaemia. It is important complication of Type I and Type II diabetes mellitus. Around 21% of patients with Type 2 diabetes shows signs of retinopathy at the time of initial diagnosis of diabetes, and the majority eventually develop some degree of retinopathy as the disease progresses.[1,2] It progresses gradually, often without symptoms in the early stages, and may lead to vision-threatening complications such as macular oedema, retinal hemorrhage, or neovascularization. Based on epidemiological research, about 7% of people with diabetes may have a higher chance of developing

DR and DME.[3] Diabetic retinopathy, if left untreated becomes one of the most challenging conditions to control and is a major cause of vision loss worldwide. A meta-analysis of data published in the IDF (International Diabetes Federation) Atlas suggested that global prevalence of Diabetic Retinopathy (DR) in diabetic patients is estimated to be 27.0% for the period 2015-2019.[4]

Prakriti is a unique concept of Ayurveda, combination of the morphological, physiological and psychological basic traits of an individual which is manifested in the intrauterine life according to *Beeja* (genetic) and *Dosha* (body humours viz. *Vata, Pitta, Kapha*) influence and is said to be invariable throughout life.[5] Genetic and intrauterine influences make, every individual a distinct entity. Accordingly, an individual has physiological and pathological variations. *Prakriti* of each person determines the response distinctively when exposed to a similar stimulus. The fundamental texts of Ayurveda have explained about specific structure pattern for eye and its appendages and various functional variations based

on the *Prakriti*.[6] Hence, *Prakriti* emphasises on the individuality and plays an important role in determining the specific pattern of susceptibility for disease (onset, progression, diagnosis, prognosis and complications). *Prakriti* is an important tool of Ayurvedic physiology with preventive, predictive, participatory, and personalised approach in therapeutics.

AIM

To study the association between *Daihik Prakriti* and Diabetic Retinopathy patients along with their severity (NPDR & PDR)

MATERIALS AND METHODS

40 patients with confirmed Diabetic Retinopathy were selected from the *Shalakya (Netra)* OPD and a thorough eye examination which included best corrected visual acuity (BCVA), and ophthalmoscopy of each patient was done to diagnose and assess the stage of diabetic retinopathy and its types (non-proliferative or proliferative). *Daihik Prakriti* was assessed by standard CCRAS *Prakriti* Assessment Scale.

Study design: A cross-sectional study

Sample size: 40 patients of diabetic retinopathy

Selection Criteria: Patients aged between 31-70 years of either sex with diagnosed case of diabetic retinopathy of type 2 diabetes mellitus. Patients willing to participate in the study and give written consent.

Exclusion Criteria: Patients of type 1 diabetes mellitus and other causes of retinopathy e.g., hypertensive retinopathy or other ocular pathology. Patients not willing to give written consent for participation in the study.

Subjective and Objective Parameters Gradations

| Subjective Parameters	Grade	Objective parameters	Grade
Diminished vision	0/1/2/3	Micro aneurysm	0/1/2/3
Floaters	0/1/2/3	Intraretinal haemorrhage	0/1/2/3
Flashes of light	0/1/2/3	Exudates	0/1/2/3
Dark adaptation	0/1/2/3	Best corrected visual acuity	0/1/2/3

OBSERVATION

Table 1: Age wise distribution of 40 patients of Diabetic Retinopathy

Age (yrs)	Number	Percentage
31-40	00	00%
41-50	05	12.5%
51-60	16	40%
61-70	19	47.5%
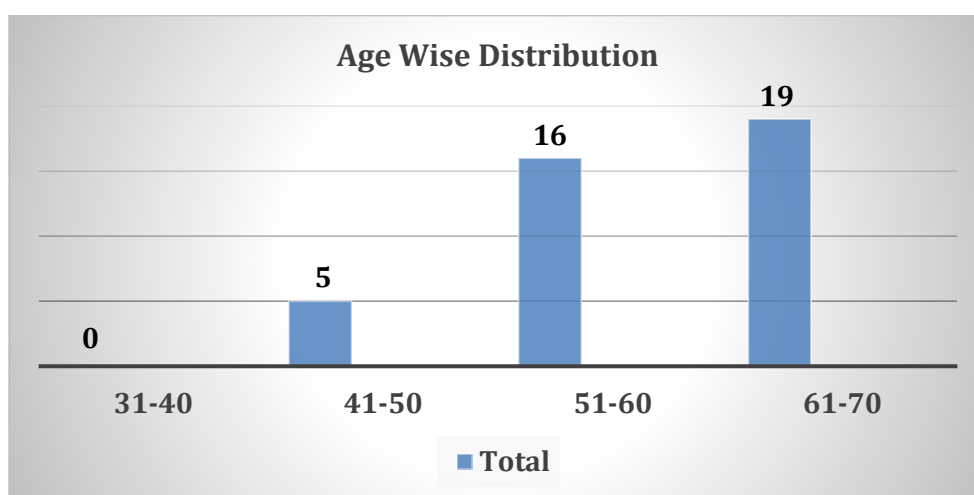
Table 2: Gender wise distribution of 40 patients of Diabetic Retinopathy

Gender	Number	Percentage
Male	25	62.5%
Female	15	37.5%

Gender Wise Distribution
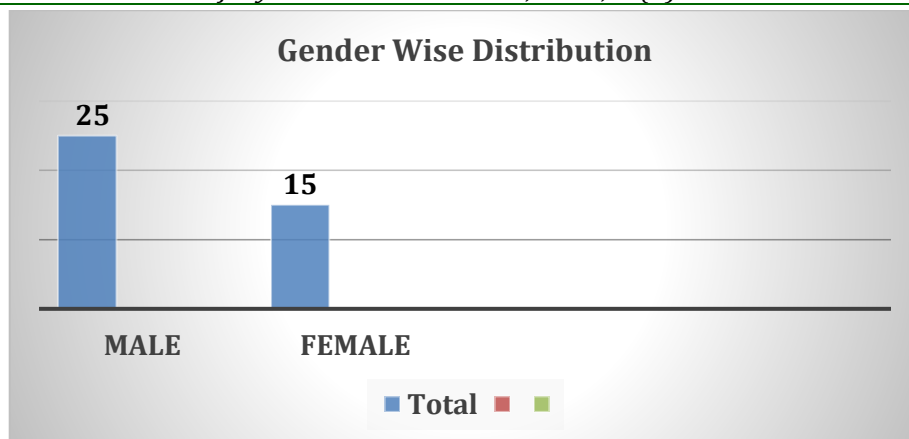
Table 3: Socioeconomic status wise distribution of 40 patients of DR

Socioeconomic status	Number	Percentage
Upper	05	12.5%
Upper middle	09	22.5%
Middle	12	30%
Lower middle	09	22.5%
Poor	05	12.5%

Socioeconomic status wise distribution
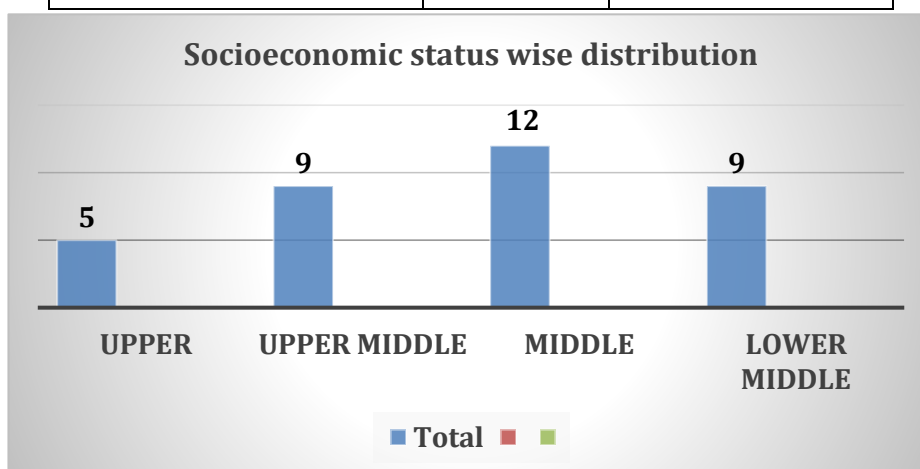
Table 4: Habitat wise distribution of 40 patients of DR

Habitat	Number	Percentage
Urban	34	85%
Rural	06	15%

Habitat wise distribution
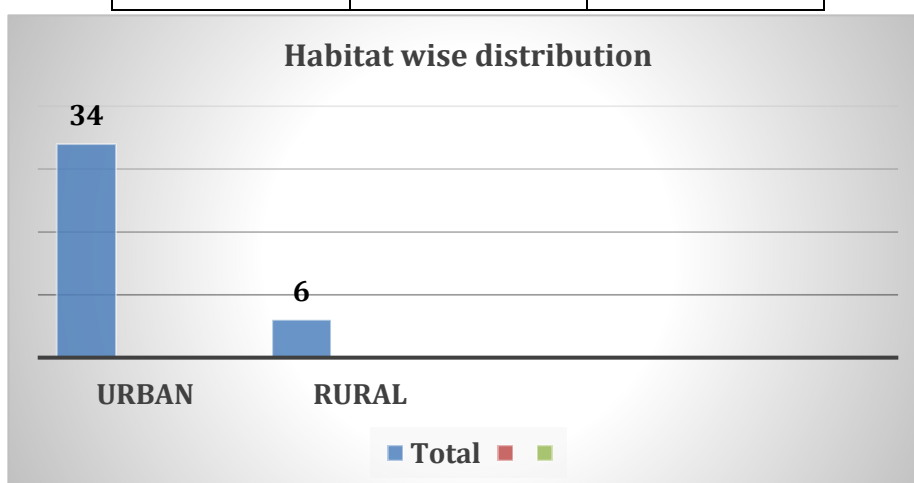
Table 5: Chronicity wise distribution of 40 patients of DR

DR Chronicity	Number	Percentage
Newly diagnosed	17	42.5%
Upto 1 year	14	35%
1-5 years	07	17.5%
6-10 years	02	5%
Above 10 years	00	00%
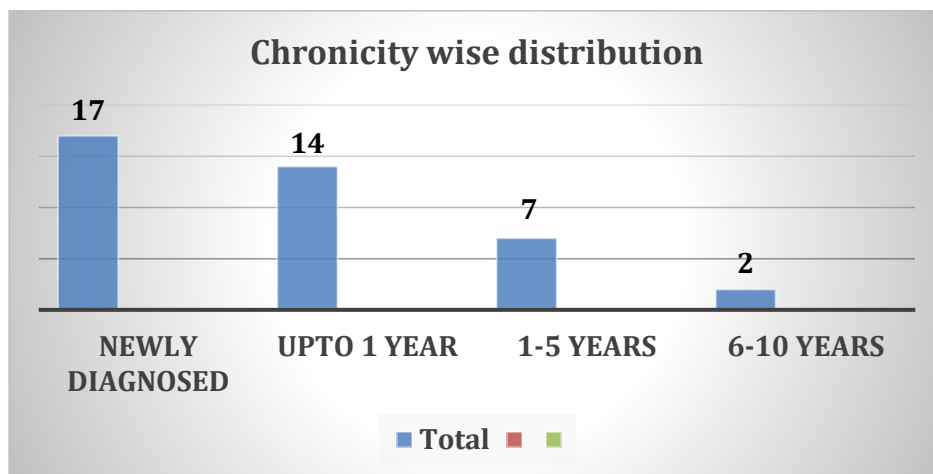
Table 6: Severity wise distribution of 40 patients of DR

Severity	Total no. of eyes	No. of eyes		Percentage	
		Right	Left	Right	Left
Mild NPDR	44	24	20	60%	50%
Moderate NPDR	12	03	09	7.5%	22.5%
Severe NPDR	13	08	05	20%	12.5%
PDR	06	03	03	7.5%	7.5%
Nil	05	02	03	05%	7.5%

Left eye
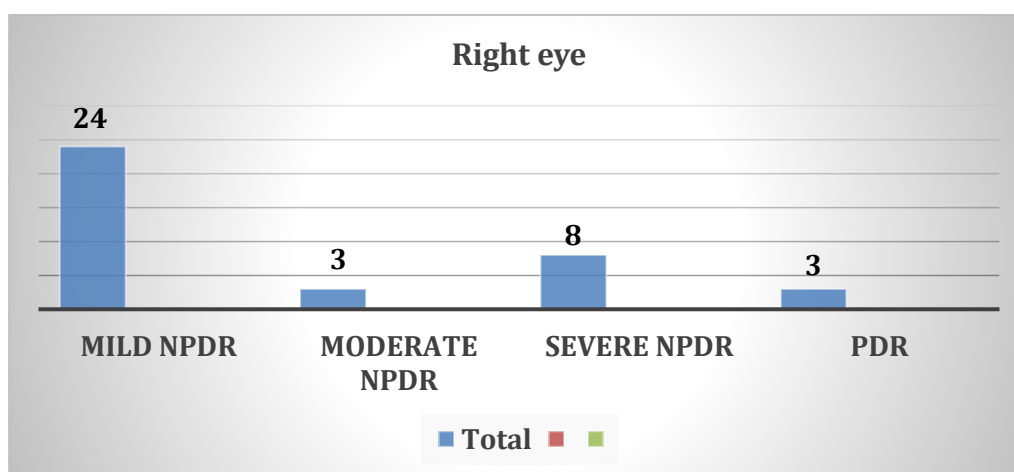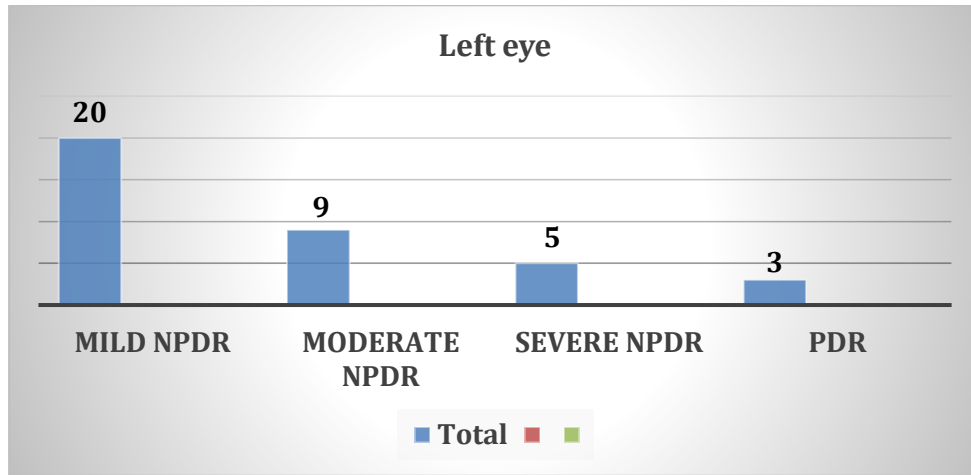
Table 7: Diabetic control wise distribution of 40 patients of DR

Diabetic Control	Number	Percentage
Controlled	05	12.5%
Uncontrolled	35	87.5%
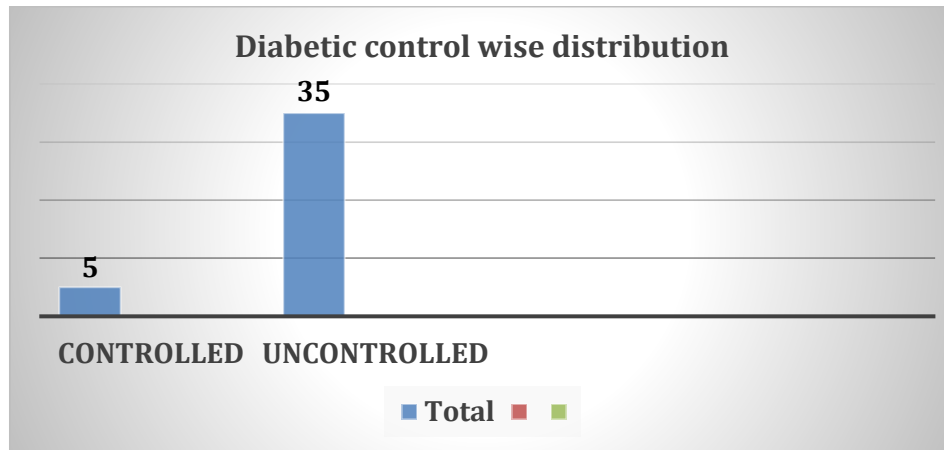
Table 8: BCVA of 40 patients of DR

BCVA	PDR		NPDR	
	RE	LE	RE	LE
<6/60	02	03	03	01
6/60- 6/36	01	-	12	10
6/24- 6/18	-	-	09	10
6/12-6/9	-	-	09	13
6/6	-	-	04	03

Table 9: *Prakriti* subdivision wise distribution

Prakriti	No. of Participants	Percentage	Total %	χ^2	df	P value
Vata Pradhan (n=06)	VP (04)	10 %	15%	6.20	2	0.045
	VK (02)	05%				
Pitta Pradhan (n=18)	PV (05)	12.5%	45%			
	PK (13)	32.5%				
Kapha Pradhan (n=16)	KV (07)	17.5%	40%			
	KP (09)	22.5%				

Prakriti wise distribution
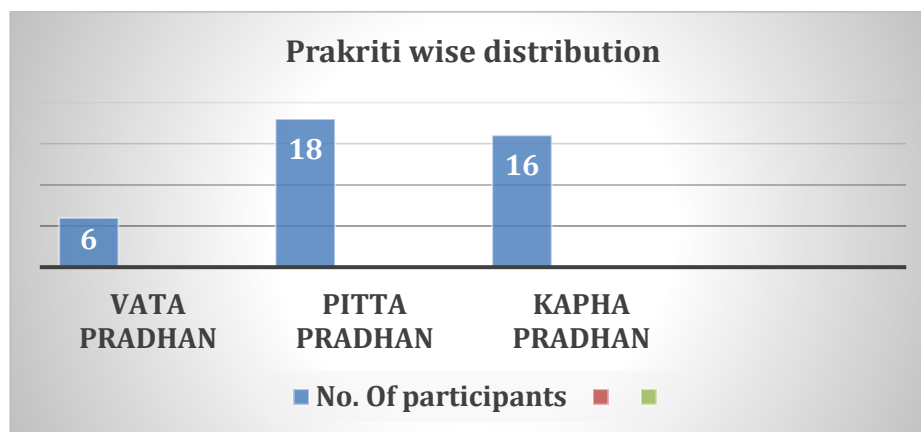
Statistical analysis

Data were compiled and analysed using SPSS version 20.0 software. Descriptive statistics were applied to obtain the frequency and percentage distribution of each *Prakriti* type. To determine whether the observed distribution of *Prakriti* among diabetic retinopathy patients differed significantly from an expected equal distribution, a chi square analysis was performed. The Chi-Square value (χ^2), degrees of freedom (df), and corresponding p-value were calculated, with statistical significance considered at p < 0.05.

OBSERVATION AND RESULT

A total of 40 diabetic patients were included in the study where maximum patients were in the age group of 61-70 yrs which constituted about 47.5%, followed by 40% in the age group of 51-60 yrs. More than half of the patients were males (n=25) covering 62.5% while females (n=15) were 37.5% of the total population. The patients with DR from urban region were much greater i.e., 85% compared to rural region which was only 15%. According to economic status majority of patients i.e., 30% belonged to middle class while 22.5% were from both upper middle and lower middle class. And patients belonging to both urban and poor class had only 12.5%.

In the study, nearly half of the patients i.e., 42.5% were found to be newly diagnosed patients and 35% were having chronicity of DR upto 1 year. 17.5% patients were having chronicity of 1-5 years and with only 5% patients having chronicity of 6-10 years. None had chronicity more than 10 years. Maximum of patients had uncontrolled bloods sugar levels which add up to 87.5% of the total population. Severity of DR was observed in both eyes where, 50% of the patients were having mild NPDR while 7.5 % had PDR. Out of 80 eyes of 40 patients of DR, the distribution of visual acuity of 74 eyes of NPDR showed variation while almost all eyes of PDR had visual acuity ≤6/60. 29 patients (72.5%) out of 40 patients had bilateral eye involvement as per the severity, rest of the patients had different degree of severity in each eye. In this

study the data indicates the majority of the patients 45% were of *Pitta Pradhan prakriti*, out of them 32.5% were of *Pitta kapha prakriti* and 12.5% of *Pitta Vata prakriti* followed by *Kapha Pradhan prakriti* 40%, out of them 22.5% were of *Kapha Pitta prakriti* and 17.5% of *Kapha vata prakriti*, rest 15 % were of *Vata Pradhan prakriti* where 10 % of *Vata Pitta prakriti* while 5% were of *Vata Kapha prakriti.*

DISCUSSION

India has a high burden of type 2 Diabetes mellitus. According to the IDF diabetes atlas 9th edition (international diabetes federation) 77 million people above the age of 18 years are suffering from Type 2 diabetes in India and it is predicted to increase to 101 million by 2030 and 134.2 million by 2024. Approximately 1 in 11 adults in India is diabetic and every one of them is at risk of developing DR. More than 50% of people are unaware of their diabetes status. There are an increasing number of pre-diabetes (25 million) adding to the burden.

Maximum patients were in the age group of 61-70 yrs which constituted about 47.5%, followed by 40% in the age group of 51-60 years and remaining 12.5% in the age group of 41-50 years. None was found in the age group of 31-40 years. One of the studies by Gadkari et.al shows that there is higher prevalence of DR with an increase in age.[7] As did other studies, this study also showed a significantly higher prevalence with an increase in age. The higher the age group, the higher the prevalence of DR likely due to longer duration of diabetes and presence of greater number of comorbid conditions.

The present study reveals that there is a male preponderance 62.5% (n=25) compared to females 37.5% (n=15). Several studies showed that males were more affected than females, these differences may be likely due to a combination of factors including difference in lifestyle, hormonal influence, and genetic predisposition.[8] Mohan, et al. (2005) found the prevalence of diabetic retinopathy significantly advanced in men (21.3%) than in women (14.6%) in a

study conducted in an urban population of Chennai city of South India (CURES-1)

In the distribution of socioeconomic status majority of patients i.e., 30% belonged to middle class while 22.5% were from both upper middle and lower middle class. Both urban and poor class had only 12.5%. Though earlier studies showed that there is significantly increased risk and severity of diabetic retinopathy in lower SES population, in the present study maximum patients belonged to middle class (30%) and patients were higher from urban environment (85%) than rural (15%).[9] This may be due to influx of higher number of patients in the OPD belonging to middle class SES.

In the present study, we found that most of the patients were newly diagnosed (42.5%) with diabetic retinopathy. These data shows that the DR awareness is often low even among people with diabetes.[10] Almost all the patients who visited the eye OPD in the hospital were having complaints of blurred vision and poorly controlled sugar level (87.5%) and not aware of the diabetic complications affecting eyesight. Uncontrolled sugar is one of the major causes of diabetic retinopathy.

Majority of the patients 45 % (n=18) were of *Pitta pradhan prakriti*, out of them 32.5% (n=13) were of *Pitta kapha prakriti* and 12.5% (n=05) of *Pitta Vata prakriti* followed by *Kapha Pradhan prakriti* 40% (n=16), out of them 22.5% (n=9) were of *Kapha Pitta prakriti* and 17.5% (n=07) of *Kapha vata prakriti*, rest 15% (n=06) were of *Vata Pradhan prakriti* where 10% (n=04) of *Vata Pitta prakriti* while 5% (n=02) were of *Vata Kapha prakriti.* Previous studies showed that the *Pitta Pradhan prakriti* had significant association in the manifestation of eye disorders.[11,12] *Pitta Pradhan prakriti* is found more, probably because *Darshan Kriya* is one of the prime functions of *Pitta* (due to *Tejansha*).[13] Due to the vitiated pitta, *Darshan Kriya* is affected therefore it may be probable cause of diseases related to eye. The number of patients with DR were found to have *Pitta* dominant DP however, the next *dosha* associated with *Pitta* was found to be *Kapha* i.e., *Pitta kapha* DP constituting of about 32.5%. It highlights the vulnerability of *Pitta* dominating *Daihik prakriti.* The present study has showed that *Daihik Prakriti* is a risk factor connected with Diabetic retinopathy. *Daihik prakriti* is genetically determined and stable constitutional factor that remain unchanged throughout life.[14] However, it can be considered a diagnostic and preventive tool by adopting dietary patterns and lifestyle.

CONCLUSION

By statistical analysis of qualitative data using chi square test revealed that this study suggests a statistically significant association between *Daihik prakriti* and diabetic retinopathy (DR) in those with Type 2 diabetes mellitus. Since the p-value is less than 0.05, it suggests that statistically significant association between *Pitta* dominance and the development of Diabetic retinopathy patients. Most patients in the study were found to have *Pitta Pradhan prakriti* (45%), pointing toward a possible predisposition for individuals with *Pitta* dominance to be more prone to eye- related complications the data also reflects the rising burden of DR in older adults, urban dwellers, and those with poorly controlled diabetes. Since *Prakriti* is a lifelong, genetically influenced constitution, it offers valuable insights not just into disease susceptibility but also into prevention and treatment. Recognising *Prakriti* early could help guide more personalized and proactive approaches in managing diabetes-related eye complications, especially through the lens of Ayurvedic principles.

Limitations and Further Scope

The present study covers a population of Bhopal, Madhya Pradesh only. Though it was carried on small sample size it showed encouraging results. However, to obtain more precise results the study should be conducted on large sample size and, multiple centers (multicentric).

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