



Research Article

AN OBSERVATIONAL STUDY TO VALIDATE THE RELATIONSHIP BETWEEN HYPERTENSIVE RETINOPATHY AND DEHAPRAKRUTI

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ABSTRACT

What is good for health and what is to be avoided is very important to stay healthy and this acceptance and rejection is depends on our own constitution i.e., *Dehaprakruti* as the *Prakruti* of the individual is unique. *Netra* is supreme *Dhyanendriya* among all the five and it is very important as we acquired all the knowledge primarily through *Netra*. Hypertensive retinopathy is the retinal vascular damage caused by hypertension. Prompt and accurate diagnosis of hypertensive retinopathy, especially when associated with malignant hypertension is necessary to avoid visual loss and systemic morbidity. Knowing owns constitution enables us to understand the function of one's entire life and dictates the form of the body and also it contains one's balance point as well as one's tendencies towards disease. This study will be helpful to deal with patients of hypertensive retinopathy and also to overcome its complications by giving appropriate patients education regarding proper *Ahar*, *Vihar*, *Dinacharya* and *Ritucharya* according to *Dehaprakruti*. So we undertaken the study entitled as "An observational study to validate the relationship between hypertensive retinopathy and *Dehaprakruti*." In the study already diagnosed 90 patients of hypertensive retinopathy as per inclusion and exclusion criteria of age group 40-70 yrs were taken. *Prakruti Parikshan* of the patients done with the help of questioners. In the study maximum 95.55% patients had essential hypertension. It was observed that maximum 64.44% patients were of *Vatapitta Dehaprakruti* followed by 22.22% that of *Vatakapha Dehaprakruti* but no any significant association was found in between grades of hypertensive retinopathy and *Dehaprakruti*. It was also found that visual impairment occurred in maximum 68.89% patients out of which maximum 45 patients were of *Vatapitta Dehaprakruti* and significant association was found between hypertensive retinopathy and *Dehaprakruti*.

INTRODUCTION

Netra i.e., eye is the *Tejomaya* organ^[1]. Among all the *Indriyas* i.e., sense organ *Nayana* (eye), the sense organ of sight or vision is said to be the most important. Most of our day to day activities are dependent on our vision. Hence *Acharya Sushruta* has described the anatomy of eye in detail in *Sushruta*

Samhita Uttartantra into three distinct part called *Mandala*, *Patala*, and *Sandhis*.^[2] *Acharya Sushruta* has described the *Netra* as *Suvrittam* and *Gostanakaram*^[3]. Presence of mind is absolutely necessary for the smooth functioning of eye. Mind activates the sensory parts of the body to gain knowledge of external modalities. Vision is nothing but the things which are interpreted by the mind. Picture made by the mind was not the things whose image falls over the retina but the mental interpretation made by the brain. Diversion of mind can be act as an inhibitory factor of vision. *Alochaka pitta* analyses the object only in the presence of mind.^[4]

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The physical and mental traits of the person are called *Prakruti*. *Prakruti* is our basic constitution which is determined at the time of conception and is fixed throughout our lifetime Internal as well as external enumeration of body features of one's own constitution is termed as *Prakruti*. There is an impact of *Dosha* on the *Prakruti* which are situated at the time of conception and it remains same throughout the lifetime but the *Prakruti* formed due to dominant *Doshas* is unaffected by the *Dosha* which dominant in that *Prakruti*.^[5,6] Formation of *Prakruti* depends on one, two or more dominant *Doshas* *Prakruti* developed during *Garbha* formation is called as *Dosha prakruti*. From the moment of conception, some men are equilibrated as the three humour i.e., *Vata*, *Pitta* and *Kapha*, some having predominance of *Vata*, some having predominance of *Pitta* and some of *Kapha*. Out of these *Prakruti* dominated by one or more *Dosha* indicates unhealthy i.e., they are mostly prone to disease and the *Prakruti* in which all the three *Dosha* i.e., *Vata*, *Pitta* and *Kapha* are balanced is said to be healthy^[7] *Sushruta* has explained that the insect born in the poison does not die due to its own poison similarly *Doshas* that is dominant according to one's *Prakruti* does not harm the individual^[8].

Hypertension is the most important public health problem in developed countries. There are two types of hypertension, primary or essential hypertension and secondary or non-essential hypertension. In Ayurveda there is no description of such a single disease which can resemble with hypertension. According to *Acharya Charaka* in case of unknown disease, the physician should try to understand the nature of disease through *Dosha dushya* and *Samprapti* then should initiate the treatment called as *Anukta Vyadhi*^[9]. According to Ayurveda all the three *Doshas* take part in pathogenesis of hypertension but *Vata dosha* plays main role hence we can say that it is *Vatapradhana Tridoshaja Vyadhi* with *Rakta* as *Pradhan Dushya*. From the pathogenesis of hypertension it can be said that hypertension is the *Vatapradhana tridoshja vyadhi* with *Vata* as the *Pradhana* (predominant) *Dosha*, particularly *Vyana vata* playing a key role. *Pitta* and *Kapha* play a complementary role in the form of *Anubandha* (associated) *Doshas*^[10]. Different *Acharya* use different terms to describe hypertension but according Ayurveda there is no description of such a single disease which can resemble with hypertension.

In modern era due to incompatible diet and lifestyle (*Virudha ahar-vihar*), mental stress, carrier stress and many more things disturbs the nourishment of body which leads to imbalance of *Dosha*, *Dhatu* and *Mala* which in turn leads to diseased condition. Hypertension is one of the most common lifestyle

disorder. In today's era every third person we meet is suffering from it. Not only old age people but younger people also suffered from hypertension. Hypertension itself does not cause symptoms but in long turn leads to complication caused by narrowing of blood vessels. The adverse effect of hypertension principally involves the blood vessels, central nervous system, retina, heart and kidney. According to modern science chronically elevated blood pressure leads to changes in the retinal vasculature called hypertensive retinopathy. Hypertension may lead to multiple adverse effects to the eye, hypertensive retinopathy is one of them. Ocular changes can be the initial findings in asymptomatic patients, necessitating primary care referral. Early and accurate diagnosis of hypertensive retinopathy is necessary to avoid visual loss due to it and this is possible by screening the hypertensive patients for retinopathy if any by performing funduscopy. Due to the changing lifestyle percentage of hypertensive patients is increasing which, if left untreated leads to hypertensive retinopathy. This study is beneficial for early diagnosis and to avoid the Hypertensive Retinopathy as per the *Prakruti*.

MATERIAL AND METHODS

This an observational study carried out after clearance from Ethical committee in GAC, Nagpur. Sutras related to *Netra* and *Dehaprakruti* were studied from *Laghutrayee*, *Bruhatrayee*, Ayurvedic textbook and modern text. Study of Hypertensive retinopathy was done through modern text with its image (fundus photo). Already diagnosed 90 patients of hypertensive retinopathy were selected and their CRF was filled after performing general examination, routine eye examinations and after that fundus examination of both eyes was done to observe the retinal changes. According to questioners enclosed at the end of CRF *Prakruti Parikshan* was done.

Inclusion Criteria

1. Already diagnosed patients of hypertensive retinopathy of both gender was selected irrespective of their caste, region and financial status.
2. Patients of age group 40-70 yrs were selected.
3. Patients having history of hypertension for 5 yrs. or more were included in our study.

Exclusion Criteria

1. Media haze due to corneal, lenticular or vitreous opacity obscuring visualization of fundus.
2. Active ocular infection.
3. Posterior capsular opacity.
4. Angular closure glaucoma or non-dilating pupils.
5. Any other disorder obscuring visibility of fundus.

6. Patients having history of hypertension for less than 5 years.
7. Patients of diabetic retinopathy and retinopathy due to toxemia of pregnancy.

Clinical Assessment

The patients of hypertensive retinopathy were selected, their case report form was filled after taking their written consent in their own language. A detailed medical history, general physical examination, habitual history, educational and occupational history of the patients was taken. The data in the medical history include duration and treatment of hypertension, any other major illness, trauma or surgical treatment. The ocular history included details present or past ocular complaints, ocular surgery if any. Addiction history includes tobacco and alcohol history. A handheld flashlight was used for performing external eye examination. The presence of strabismus, extra ocular movement abnormalities or any other gross abnormality on the face and eyes were examined. Visual acuity was recorded with the help of Snellen's chart and Landolt's ring chart. Slit lamp examination was done, using a moderately wide beam, the eyelids, margins, eyelashes, canthi and puncta were examined systematically. After that palpebral and bulbar conjunctiva, sclera and cornea were examined. The cornea anterior chambers and iris were examined by using narrow parallel beam for abnormality. The iris and pupillary margins were examined under high magnification to look for iris neovascularization. Intraocular pressure was of both the eyes was measured by using a automated non-contact tonometer. If there was elevated intraocular pressure, iris neovascularization or a shallow anterior chambers then gonioscopy was performed.

Fundus Examination

For fundus examination pupil dilation was done by using tropicamide 0.5% and phenylephrine 5% eye drop. Before fundus photography it was ensured that there must be at least 6mm pupil dilation. Considering the fundus photography as the gold standard to document and diagnose the hypertensive changes in retina, 45 degree 4 field photograph of both the eyes of all selected individual were taken by using the Zeiss Visucam fundus camera with visupac digital image archiving system. Images were stored as uncompressed jpeg files. Those eyes which show hypertensive retinopathy changes were taken in study.

The grading of hypertensive retinopathy was done according to Keith-Wagner-Barkan classification which as follows If, there was a grade 1 in left eye of patients and grade 2 in right eye then we had considered the grade 2 as a overall grade of hypertensive retinopathy. In this way in all cases, we

had considered the higher grade as a grade of hypertensive retinopathy of the patients.

Visual acuity grading was done according to WHO criteria for visual impairment and blindness which is as follows.

Category of visual impairment	Best corrected visual acuity
0 (normal)	6/6 to 6/18
1 (visual impairment)	<6/18 to 6/60
2 (severe visual impairment)	<6/60 to 3/60

Keith and Wegner^[11]

This is traditional and widely cited. It relates only systemic hypertension and arteriolar sclerosis. They have classified hypertensive retinopathy changes into following four grades

Grade 1: It consists of mild generalized arteriolar attenuation, particularly of small branches with broadening of arteriolar light reflex and vein concealment.

Grade 2: It comprises marked generalized narrowing and focal attenuation with deflection of vein at arteriovenous crossing. (Salus' sign)

Grade 3: Grade 2 with copper wiring of arterioles, banking of veins distal to arteriovenous crossings (Bonnet sign), tapering of veins on either side of the crossings (Gunn sign), right angle deflection of veins (salus' sign). Flame shaped haemorrhages, cotton wool spots and hard exudates are also present.

Grade 4: This consists of all the changes of grade 3 with silver wiring of arterioles and papilloedema.

Higher value out of both the eyes can be considered as final grading for example if visual acuity of left eye is 1 and that of right eye is 2 then, 2 is considered as visual acuity if that patients.

The patients were investigated for complete blood count (CBC), ESR, urine (routine and microscopic), BSL and HIV to exclude infection and diabetes.

Prakruti Parikshan

Prakruti Parikshan was done according to questioners enclosed at the end of CRF. In *Dehaprakruti Parikshan* all the characters were not included, only the characters with which *Prakruti Parikshan* can be done significantly had been taken and *Prakruti Parikshan* proforma was filled up. There were total 30 questions in the *Prakruti Parikshan* proforma

- A. Indicate *Vata Pradhan Dehaprakruti* characteristics.
- B. Indicate *Pitta Pradhan Dehaprakruti* characteristics.
- C. Indicate *Kapha Pradhan Dehaprakruti* characteristics.

More number of characters out of 30 questions decided the *Pradhan dosh Dehaprakruti* and second more decided the *Anubandha* of an individual.

RESULT AND DISCUSSION

Data of 90 patients were observed for three different groups *Vatapitta Prakruti (VP)*, *Vatakapha Prakruti (VK)* and *Kaphapitta Prakruti (KP)*. Statistical analysis was done using software "STATA version 13.0", where categorical variables (all demographic

variables, Grades of Hypertensive retinopathy, duration of hypertension, addiction) were expressed in frequency and percentages. Association of Grades of Retinopathy, visual acuity and addiction with different *Dehaprakruti* were performed by applying Pearson's chi² -test. For small numbers, Fisher exact test was used wherever applicable. P<0.05 was considered as statistical significance. Obtained Data has been presented with the help of tables.

Table 1: Showing Age wise Distribution of 90 Patients

S. No.	Age in yrs	Number	Percent
1.	40-49	18	20.00
2.	50-59	24	26.67
3.	60-69	31	34.44
4.	≥70	17	18.89
	Mean age	58.9 ± 9.53 (40 - 70)	

In the studied 90 patients of Hypertensive Retinopathy maximum 31 patients were from the age group 60-69yrs, 24 patients were from age group 50-59yrs, 18 patients were from age group 40-49 and 17 patients were from age group ≥70. Mean age of the patients in studied sample was 58.9±9.53.

Table 2: Showing Gender Wise Distribution of 90 Patients

S. No.	Gender	Number	Percent
1.	Male	51	56.67
2.	Female	39	43.33

In the studied 90 patients of Hypertensive Retinopathy 51 were males and 39 were females.

Table 3: Showing Marital Status wise Distribution of 90 Patients

S. No.	Marital Status	Number	Percent
1.	Unmarried	2	2.22
2.	Married	88	97.78

Maximum 88 patients were married and 2 patients were unmarried.

Table 4: Showing Religion Wise Distribution of 90 Patients

S. No.	Religion	Number	Percent
1.	Hindu	84	95.33
2.	Christian	1	1.11
3.	Muslims	5	5.56

In the studied 90 patients of Hypertensive Retinopathy 84 patients were Hindu, 5 patients were Muslims and 1 was Christian.

Table 5: Showing Education Wise Distribution of 90 Patients

S. No.	Education	Number	Percent
1.	Literate	64	71.11
2.	Illiterate	26	28.89

64 patients were literate and 26 patients were illiterate.

Table 6: Showing Occupation Wise Distribution of 90 Patients

S. No.	Occupation	Number	Percent
1.	Business	8	8.89
2.	Housewife	21	23.33
3.	In Service	25	27.78
4.	Labour	17	18.89
5.	Retired	19	21.11

In the obtained data of 90 patients of Hypertensive Retinopathy maximum 25 patients were in service persons, 21 were housewives, 17 belonged to labour group, 8 belonged to business group and 19 were retired persons.

Table 7: Showing Socio-Economic- Status Wise Distribution of 90 Patients

S. No.	Socioeconomic Status	Number	Percent
1.	Lower Class	6	6.67
2.	Middle Class	33	36.67
3.	Upper Middle Class	51	56.67

Maximum patients were from the upper middle class, 33 from middle class and 6 from lower class.

Table 8: Showing Dietary Pattern Wise Distribution of 90 Patients

S. No.	Diet	Number	Percent
1.	Mixed	58	64.44
2.	Veg	32	35.56
3.	Total	90	100

32 patients had vegetarian diet and 58 patients had mixed diet i.e., vegetarian and non-vegetarian both.

Table 9: Showing Addiction wise Distribution of 90 Patients

S. No.	Addiction	Number	Percent
1.	Alcohol	20	22.22
2.	Smoking	7	7.78
3.	Alcohol + Smoking	8	8.89
4.	No Addiction	55	61.11

In the studied 90 patients of Hypertensive Retinopathy 55 patients had no addiction and those addicted were addicted either to alcohol, smoking or both of which 20 were addicted to alcohol, 7 were addicted to smoking and 8 were addicted to alcohol and smoking both.

Table 10: Showing Association of Addiction and Hypertensive Retinopathy in Different *Prakruti*

S. No.	Addiction	KP	VK	VP
1.	Alcohol	4	4	12
2.	Smoking	1	2	4
3.	Alcohol + Smoking	0	1	7
4.	No Addiction	7	13	15
Chi2-Value		3.0991		
P-Value		0.854, NS		

Out of 90 patients 55 patients had no addiction. 4 patients of KP, 4 of VK and 12 of VP were addicted to alcohol. 1 patient of KP, 2 of VK and 4 of VP were addicted to smoking while 1 patient of VK and 7 of VP were addicted to alcohol and smoking both. (chi2 value 3.0991, p value 0.854).

Table 11: Showing Distribution of 90 Patients on the Basis of Duration of Hypertension

S. No.	Duration of HTN	Number	Percent
1.	5-9 yrs	62	68.89
2.	10-14 yrs	25	27.78
3.	≥15 yrs	3	3.33

Table 12: Showing Association of Duration of Hypertension and Hypertensive Retinopathy in Different *Dehaprakruti* in Both Eyes

S. No.	Duration	KP	VK	VP
1.	5-9 yrs	10	13	39
2.	10-14 yrs	2	7	16
3.	≥15	0	0	3
CHI2-Value		14.1263s		
P-Value		0.731, NS		

The patients in our study were grouped as above on the basis of chronicity hypertension. Maximum 62 patients were in the 5-9yrs chronicity group out of which 10 were of KP, 13 of VK and 39 of VP. 25 patients belonged to 10-14yrs chronicity group of which 2 of KP, 7 of VK and 16 of VP. 3 patients were having history for ≥ 15 yrs and they were of VP. (χ^2 value-14.1263,P value- 0.731).

Table 13: Distribution of 90 Patients on the Basis of type of Hypertension

S. No.	Type of Hypertension	Number	Percent
1.	Primary	86	95.55
2.	Secondary	4	4.45

Maximum 86 patients were of primary hypertension and 4 patients were of secondary hypertension.

Table 14: Showing Distribution of 90 Patients on the Basis of Different Dehaprakurti

S. No.	Dehaprakurti	Number	Percent
1.	KP	12	13.33%
2.	VK	20	22.22%
3.	VP	58	64.44%

KP- Kapha pitta dehaprakurti, VK- Vatapita dehaprakurti, VP-Vatapitta dehaprakurti

In the studied 90 sample of hypertensive retinopathy maximum 64.44% (58) patients were of *Vatapitta dehaprakurti* (VP), 22.22% (20) patients were of *Vatakapha dehaprakurti* and 13.33% (12) were of *Kaphapitta dehaprakurti*.

Table 15: Showing Association of Grade of HR and Different Prakurti in Both Eyes

S.No	Grade of HR	KP	VK	VP	Total
1.	1	10	11	24	45
2.	2	2	6	22	30
3.	3	0	3	10	13
4.	4	0	0	2	02
CHI2-Value		8.2184			
P-Value		0.276, NS			

In the studied sample total 45 patients were of grade 1 hypertensive retinopathy out of which maximum 24 were of *VP Dehaprakurti*, 11 were of *VK Dehaprakurti* and 10 were of *KP Dehaprakurti*. 30 patients were of Grade 2 hypertensive retinopathy, out of which 22 were of *VP Dehaprakurti*, 06 were of *VK Dehaprakurti* and 02 were of *KP Prakurti*. 10 patients of *VP Dehaprakurti* and 03 of *VK Dehaprakurti* were having Grade 3 hypertensive retinopathy and 02 patients of *VP Dehaprakurti* were having Grade 4 hypertensive retinopathy. (χ^2 value 8.2184 and P value 0.276).

Table 16: Showing Association of Visual Acuity and HR in Different Dehaprakurti in Both Eyes

S. No.	Visual Acuity	KP	VK	VP	Total
1.	0 (Normal)	8	6	9	23 (25.56%)
2.	1 (Visual Impairment)	4	13	45	62 (68.89%)
3.	2 (Severe Visual Impairment)	0	1	4	05 (5.56%)
CHI2-Value		14.1263			
P-Value		0.009, Highly Significant			

Visual acuity of the patients was divided into three groups according to WHO criteria for blindness. Visual acuity of 23 patients was normal (0) out of which 8 were of KP, 06 were of VK and 09 were of VP. Visual impairment (1) were seen in 62 patients out of which 45 patients belongs to VP, 13 belongs to VK and 04 belongs to KP. Severe visual impairment was seen in 01 patient of VK and 04 patients of VP. (χ^2 value 14.1263 and P value 0.009).

CONCLUSION

The study was the hospital based observational study where total 90 patients of hypertensive retinopathy were assessed to find out in which *Dehaprakurti* it was observed mostly. The following conclusions were drawn from our study.

- Ayurveda concerns on individualistic and unique approach in understanding and accessing one's health by knowing *Prakurti*. This knowledge of

Prakruti helps us in diagnosis and guides us to adopt healthy life style for good health.

- Hypertensive retinopathy occurred as a complication of hypertension is important in cardiovascular risk stratification of hypertensive patients as ocular defects may be the initial finding.
- Hypertensive retinopathy can be managed as *Anukta Vyadhi*.
- Prime conclusion of our study is that hypertensive retinopathy is found in patients of *Vatapitta Dehaprakruti* followed by *Vatakapha Dehaprakruti*.
- According to chi-square test statistically non-significant association is found between addiction of alcohol and smoking with hypertensive retinopathy and different *Dehaprakruti*.
- A statistically non-significant association is found between duration of hypertension and hypertensive retinopathy in different *Dehaprakruti*.
- Maximum patients are of Grade 1 and Grade 2 hypertensive retinopathy. Out of which maximum were of *Vatapitta Dehaprakruti*, but significant association is not found between grades of hypertensive retinopathy and different *Dehaprakruti*.
- Visual acuity is significantly associated with hypertensive retinopathy in different *Dehaprakruti*.
- This study will be helpful to prevent its occurrence in individual of different *Dehaprakruti* and also helpful for further researches related with this topic.

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