

Review Article

# Understanding Diabetic Retinopathy in Ayurvedic Parlance - A Review Article

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## I N F O

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## A B S T R A C T

According to WHO 60% of factors related to individual health and quality of life are mutually related to lifestyle. Over 61% of all deaths in India are due to lifestyle or Non Communicable Diseases. Diabetes and diabetic retinopathy have been emerging as an important non communicable disease affecting eye. *Prameha* leading to *dristigata roga* based on the basic principles of *Ayurveda* and effect on netrapatalas leading progressively to *timira*, *kacha*, *linganasha* thereupon is analysed. *Charaka Samhita*, *Sushruta Samhitha*, *Ashtanga Hridaya* and various research articles and contemporary science books of the concerned subject are referred. Management of the condition involves *Nidana Parivarjana* and the treatments as per *Ayurvedic* classics help in *Samprapti Vighatana* thereby giving relief to the patient. Proper and timely treatment by *Ayurveda* helps in reversing damage to the eyes and better management of the condition.

**Keywords:** Diabetic Retinopathy, *Ayurveda*, *Prameha*, *Timira*, Literary Review

## Introduction

According to WHO, 60% of factors related to individual health and quality of life are mutually related to lifestyle.<sup>1</sup> Lifestyle is a major factor thought to influence susceptibility to many diseases including eye. Habits like sedentary routine, smoking, drinking alcohol, poor diet leads to lifestyle disorders. Over 61% of all deaths in India are due to lifestyle disorders.<sup>2</sup> Diabetes being one among the major lifestyle related disease is a complex metabolic disorder wherein persistent hyperglycaemia and glucose intolerance is seen due to the pancreas not producing enough insulin hormone or ineffective use of insulin by the body. Type 2 diabetes is the most common type found, accounting for approximately up to 95% of diabetes in developing countries. Hyperglycaemia in Diabetes overtime impacts systems of the body especially nerves and blood vessels.

Diabetes and Diabetic Retinopathy (DR) have been emerging as an important non communicable disease affecting eye. DR is a complication of Diabetes mellitus wherein the micro vascular structure of the eyes gets affected. Prevention and management of chronic conditions is an important part of our overall health, especially when it comes to our eyes. The World Health Organisation estimated the global prevalence of diabetes among adults over 18yrs of age as 8.5% in 2014. Indian health ministry's first national diabetes and diabetic retinopathy survey (2015-19) has revealed that the prevalence of DR is 16.9% while the prevalence of sight threatening DR is 3.6%. Mild retinopathy was the most common with prevalence of 11.8%.<sup>3</sup>

## Diabetic Retinopathy<sup>4</sup>

DR, one of the leading causes of blindness around the world being a progressive disorder of the eye that occurs

in the following 3 stages:

1. No apparent DR
2. Non-Proliferative (NPDR)
3. Proliferative (PDR): Neovascularisation of the disc, Neovascularisation of the retina

NPDR is further sub-divided into:

- Mild (At least one micro aneurysm)
- Moderate [Extensive intra-retinal haemorrhages and/or micro aneurysms and/or cotton wool spots, venous beading or intra-retinal micro vascular abnormalities (IRMA) definitely present, but not as severe as severe NPDR]
- Severe (Intra-retinal haemorrhages in four quadrants, Venous beading in two quadrants, Severe IRMA in one quadrant)

## Materials and Methods

All the relevant Ayurvedic books like *Charaka Samhita*, *Sushruta Samhita*, *Ashtanga Hridaya* and various research articles, websites and contemporary science books of the concerned subject are referred and critically analysed.

## Result & Discussion

Eye has been given utmost importance in Ayurveda as it is one among the twelve praana considered classically.<sup>5</sup> Pitta has one of its natural seats in eyes helping in carrying out its *prakrutha karma* of *darshana*<sup>6</sup> because of *Agni mahabhoota* predominance. According to Ayurveda classics main doshas like *Prana vayu*, *Vyana vayu*, *Chakshurvaisheshika Alochaka pitta*,<sup>7</sup> *Tarpaka kapha* are involved in the maintenance of physiological functions of eyes.<sup>8,9,10</sup> Eyes are especially vulnerable to vitiated *kapha dosha*<sup>11</sup> and *Prameha* is basically a *tridoshaja vyadhi* with *kaphadosha predominance*, wherein the *dravaguna* of *kapha* is in increased state due to *nidana sevana* like *aasyasukha*, *swapnasukha*, *dadhi* etc.,<sup>12</sup> which are *achakshushya* as well and they inturn vitiate *mamsa* and *shareeraja kleda* thus contributing in the pathogenesis of the disease enhancing the vulnerability of eye disease as well in the process, wherever *khavaigunya* is found in the *sthana* of *chakhurindriya*. *Rogotpatti hetu* according to acharya *Vagbhata* includes *agnimandhya* because of which *saama* condition manifests wherein *srotorodha* can be seen<sup>13</sup> like *atipravritti* type seen in *prameha* due to *medovaha srotodushti* exhibiting *bahumutrata* (excessive passage of urine) lakshana. Involvement of vital organs like eye in *prameha samprapti* has been mentioned by *acharya Charaka* as *netra upalepa*<sup>14</sup> wherein *upalepa* is the *prakupita kapha karma*.<sup>15</sup> Since *srotas* is the inner transport system of the body which provide platform for activities of other important bio-factors like three *doshas*, the seven *dhatu*s, the *ojas*, the *agni* etc.,<sup>16</sup> so its affliction hampers the normal physiology of the body thus contributing in the pathogenesis of the disease like in *Pramehajanya netra*

*roga* which occurs as an *upadrava* of *Prameha*, wherein *ksheena ojus*, vitiated *dushyas* and *doshas* move in the *siras* in *urdhvajatru* which upon reaching *netra* manifest *netra roga lakshanas* by affecting the normal physiology of the eye.<sup>17</sup> As *Netrapatalas* and some *dhatu*s have *ashrayaashrayibhaava sambandha*,<sup>18</sup> *patalas* gets afflicted as such with the vitiated *doshas* in untreated/chronic/poorly managed *Prameha roga* accordingly as *dhatvagnimandhya* leads to poor nourishment of the respective *dhatu*s and resultant *dhatukshaya* along with increased *malaroopi pitta*, *kapha* carried in *rakta* affects *drustimandala* thereby manifesting lakshanas of *Timira*, *Kacha* and *Linganasha* in stages with the affliction of *prathama*, *dvitiya*, *trithiya*, *chathurtha patalas* with the chronicity of the disorder.

Fundoscopy findings of DR like hard exudates, microaneurysms, intraretinal haemorrhages, cotton wool spots, neovascularisation can be understood in Ayurvedic parlance as follows :

Hard exudates consists of lipid residues of serous leakage that settle in outer retinal layers indicating a leakage from the circulation at a level which probably requires a degree of structural damage to retinal vascular endothelium this can be understood by knowing the *prakupita kapha karma* of *sneha katinya*<sup>15</sup> occurring due to damage of *raktadharakala* which is basically present in *mamsa* and *siras* which has similarities with the endothelial lining of blood vessels associated with *vyana vata vikruti*.

Micro aneurysms usually temporal to the fovea seen in mild NPDR are the earliest clinically visible changes seen in the retina wherein local expansion of the capillaries due to disruption of the internal elastic lamina of the blood vessel leading to vascular endothelial dysfunction which can be understood by understanding *siraasaithilya* occurring due to *dhatukshaya* in *Prameha* as a result of excessive *apatarpana* associated with *Sira-Granthi* type of *srotodushti* in *raktavaha srotas* thereby causing *dristikshaya*.

Intra-retinal haemorrhages appear as a result of ruptured micro aneurysms, capillaries and venules of the retinal vasculature; this can be understood with *vimargagamana* and *atipravritti* of vitiated *vyana vayu*, *praana vayu*, carried in the *rakta dhatu* whose vitiation causes *malaroopi pittavridhi* in the *abhyantara mukha srotas* i.e., *raktavaha srotas* caused as a result of causes like excess *snigdha*, *vidahi aahara*, *aatapa sevana* etc, thereby affecting the *raktadharakala* by the *ushna guna* of vitiated *pitta* and pressure increase due to increased *doshas* and *dhatu* as a result, presents with *urdhwaga raktapitta lakshanas* which occurs in association with vitiated *kapha dosha* as bleeding in *netra* affecting the *dristi* which is one of the main seat of *pitta*.

Cotton wool spots are seen as localised white-yellowish

fluffy areas of discolouration and are a consequence of capillary occlusion in the nerve fibre layer of retina indicating infarction at the site which can be understood due to *prakupitha kapha* and *medas* which vitiate due to common causes like *avyayama* (lack of exercise), *divaswapna* (daytime sleep), *medhyaanam atibhakshanaath* (fatty food over intake), *vaarunya atisevana* (intake of excess alcohol) leading to *medovahasrotodusti*<sup>19</sup>, *sleshmavahasrotodusti* causing *sanga* in *raktavahasrotas*.

Neovascularisation seen in case of PDR wherein new blood vessels proliferate from pre-existing retinal blood vessels stimulated by retinal ischemia in order to revascularise the hypoxic areas can be understood as *Vata* being *pravartaka* of *chesta*<sup>20</sup> the cell division occurring in the proliferation of blood vessels can be attributed to one of its function, also due to *Praana vayu aavarana* of *Vyanavata*,<sup>21</sup> associated with vitiated *kapha* and *medas* causing *atipravritti* type of *srotodusti* in *raktavahasrotas* leads to *vaishmya* of *raktavahasiras* thereby it affects *roopagrahana*.

### Treatment

Although retinal laser photocoagulation, anti vascular endothelial growth factor injections and vitrectomy are the line of treatments in the contemporary science for diabetic retinopathy they do not address the fundamental disease processes associated with the occurrence of retinopathy and also they are not without any side effects. In *Ayurveda*, since *Prameha* is one among eight *mahagadas*, because of its deep rooted nature and possibility of development of complications, it needs to be managed through multi-angle approach starting from stressing on *Nidana Parivarjana* i.e., avoidance of causative factors which in the case of *Pramehajanya netra roga* involves avoidance of *nidana* factors causing *Prameha*, along with *Samprapti Vighatana chikitsa* considering the *deha prakruthi, desha, bala, kala, vyadhi avastha* etc., creating *niraama avastha*, *Shodhana* therapy like *Virechana, Nasya, Basti* like *Chakshusya Basti* which has *Yashtimadhu* as a main *chakshushya* ingredient, *Shamana* therapy which includes mitigation of vitiated *doshas* with drugs accordingly like having *Chakshushya, kaphahara, medohara gunas* like *Punarnavastaka kashaya, Jeevanthyadi ghrita, Mahatriphaladi ghrita, Saptamrita loha, Durvadi ghrita, Mahavasakadi kashaya for sthambana* in haemorrhagic condition. *Sthanika netra chikitsa* with *Netra Kriyakalpas* like *Tarpana, Putapaka, Seka, Anjana, Aschyotana, Vidalaka*, using drugs like *triphala, lodhra, yashtimadhu, loha, madhu*, etc according to the stage of the disease. *Murdhni tailas* especially mentioned in classics like *Shirobasti, Shirodhaara* etc helps in *indriya tarpana* and *prasaadana* which can be practiced using medications accordingly.

### Conclusion

Effect of *Prameha* on eye has been described in *Ayurvedic* classics of the Samhitha period dating back to 6<sup>th</sup>-7<sup>th</sup> century BC whereas Diabetic retinopathy came up to be diagnosed in contemporary science only from 1855 and it can be understood in the present era with multi-dimensional approach involving concepts of *Tridoshas, Dushyas, Srotas, Kala, Agni, Aavarana, Aama*, etc. Having regular comprehensive eye examinations can detect problems long before symptoms show up and should be an important part of our regular preventive health routine. Strong methods to control the use of and exposure to tobacco, coupled with promotion of healthy lifestyles, should be an integral part of any national program. *Vaidyas* using their *yukti* combined with the principles of *shastra* can develop simple easy to follow treatment modalities, and contribute to the building of healthy independent society which inturn helps in the economic growth of the country by reducing the morbidity and dependence of the population by strengthening the human resource of the nation.

**Conflicts of Interest:** None

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