



Life style disorders in ophthalmology and their management

Singh Shalini¹✉ Panda Ipsita², Prajapati Abhay³, Pandey A.K. ¹ and Kumar Vipin⁴

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Abstract

Lifestyle disorder defined as disease linked with the way people live their life. A WHO report opines that in many middle income and industrialized countries eye condition have emerged as potential threats to the status of sight and their populations. These being diabetic retinopathy, glaucoma, age related macular degeneration, cataract, retinal vein occlusion disease and dry eye. Out all these life style diseases the most contributing factors affecting visual health are metabolic syndrome, obesity, diabetes, hypertension, dyslipidemia etc. To combat these situations *Ayurveda* can also offer many management skills that are put forth in this article.

Key words: *Lifestyle disorder, Glaucoma, Metabolic syndrome, Dyslipidemia.*

Introduction

Lifestyle disorder can be defined as diseases that are consequences to the ways a person leads his life. This is commonly caused by alcohol, drug and smoking abuse as well as lack of physical activity and unhealthy dietary habits. These life style exposures are significantly associated with risk of several different diseases which may lead to different ophthalmological conditions. Prevalence rate of these diseases in today's scenario are diabetic retinopathy 22.4%, cataract 22.9% and retinal diseases 11.5% (McLeod, et al., 1988). A WHO report opines that in many middle income and industrialized countries eye condition have emerged as potential threats to the status of sight and their populations. These being diabetic retinopathy, glaucoma, age related macular degeneration, cataract, retinal vein occlusion disease and dry eye. Diabetic retinopathy is the first leading cause of blindness with prevalence of 3.5% in general population and 18% in diabetics. Retinal vein occlusion disease is the second cause of vision loss worldwide, with prevalence rate in between

0.3% -1.6%. ARMD (age related macular degeneration) ranks third among the global cause of visual impairment with blindness prevalence rate of 8.7%. A shift in the purchasing power with sedentary life styles owing to best use of technology have paved the way for now-a-days population to face many diseases which previously affected old age mass. 37.03% of the population is now facing the problem of life style disorder in India. Out all these life style diseases the most contributing factors affecting visual health are metabolic syndrome, obesity, diabetes, hypertension, dyslipidemia etc. Faulty visual practices can now be determined as the common aggravating factor for many diseases like cataract, glaucoma, age related macular degeneration, dry eye, retinal vein occlusion disease, retinopathy, etc. WHO and Indian Govt. both are setting forth many programs to counter attack this emerging health trend. To combat these situations *Ayurveda* can also offer many management skills which are put forth in this article. To analyze & compile facts related to ocular diseases due to lifestyle disorders & putforth certain *Ayurvedic* managements of these conditions.

Author's Address

¹Department of Shalakyia Tantra, Uttarakhand Ayurved University, Gurukul campus, Haridwar-249404

²Department of Rachana Sharir, Uttarakhand Ayurved University, Rishikul campus, Haridwar-249401

³Department of Kayachikitsa, All India Institute of Ayurveda New Delhi- 110076

⁴Department of Ayurveda Samhita Evum Siddhantha, Uttarakhand Ayurvedic University, Gurukul Campus, haridwar

E-mail: drsinghshalini09@gmail.com

Material and Method

This article is based on the conceptual study of different materials from sources like classical ayurvedic texts, ophthalmological texts, internet websites, etc.



Impact of life style disorder on ocular diseases:

Metabolic Syndrome – The components of metabolic syndrome include obesity, diabetes, hypertension & dyslipidemia. The association of diabetes and hypertension with retinopathy, cataract and raised intra ocular pressure is well known. Person with metabolic syndrome are known to be at risk of developing large vessels atherosclerotic disease. Prevalence rate of metabolic syndrome are 33.5% overall, 24.9% in males and 42.3% in females. Diagnostic criteria for metabolic syndrome all most all the patients with diabetes or prediabetes and concomitant CVD risk factors of HTN, Obesity and Dyslipidemia also have insulin resistance. The syndrome is increasingly being recognized as a distinct entity affecting a large population of adult population.

According to the National Cholesterol Education Program (NCEP) guidelines, the metabolic syndrome is based on the presence of three of the following five risk factors (Rupali *et al.*, 2012).

- Abdominal obesity (waist circumference > 40 inches in men, >35 inches in women)
- Plasma triglycerides 150mg/dl
- Plasma high density lipoprotein (HDL) cholesterol < 40 mg/dl in men and < 50 mg/dl in women
- Blood pressure >130/85mmHg
- Fasting Plasma Glucose >110mg/dl.

Obesity- Overweight or obese persons are at increased risk of diabetic retinopathy, age related macular degeneration and glaucoma. Other conditions such as retinal vein occlusions, floppy eye lid syndrome, stroke causing visual loss and thyroid related eye diseases have also been linked to obesity.

Diabetes mellitus- Diabetes mellitus is a metabolic disorder which can be characterized by high levels of blood glucose. Prolonged exposure in patients suffering from chronic uncontrolled hyperglycemias can lead to various complications in the eye like blepharitis, orbital cellulitis, recurrent styes, xanthelasma, dry eye, keratopathy, neovascularisation, uveitis, cataracts, endophthalmitis, retinopathy, macular oedema, diabetic papillopathy, optic neuropathy, glaucoma, cranial nerve palsies and stroke induced vision loss.

Hypertension- Hypertension can cause damage to the blood vessels in the retina, the area at back of

the eye. This eye disease is known as hypertensive retinopathy. Hypertensive choroidopathy occurs as a result of choroidal ischaemia. Hypertensive optic neuropathy results from severely elevated blood pressure.

Dyslipidemia- Dyslipidemia is defined as having blood lipid level that is too high or too low. People with high level of LDL and triglycerides or very low HDL levels tend to have higher risk of developing atherosclerosis which causes vein occlusion disease of retina.

Emerging trends of Ophthalmological diseases related to life style factors-

Dry Eye- Dry is a multifactorial disease of the tear and ocular surface that result in symptoms of discomfort, visual disturbance and tear film instability with potential damage to ocular surface. This disease is developed due to prolong use of VDTs (Video Display Terminals) and heat exposure.

Diabetic retinopathy- Diabetic retinopathy the major reason of blindness in adults of 20-74 years of age is caused due to microangiopathy affecting all the small retinal vessels. It is characterized by increase vascular permeability, ocular hemorrhages, lipid exudates by vascular closure & also mediated due to the development of new vessels in the retina and the posterior vitreous surface. Studies suggest that the most consistent risk factors for the development and severity of retinopathy are duration of diabetes, diagnosed at a young age, high glycosylated haemoglobin levels and high systolic blood pressure.

Macular Degeneration- The macula of human eye progressively degenerates with age, more quickly in some people than in others. This degeneration involves the loss of photoreceptors in the macula of the eye. Several life style changes have been related to increase in rate of AMD.

Retinal Vein Occlusion Disease- RVO is a common vascular disorder of the retina and one of the most common causes of vision loss worldwide. Specifically it is the second most common cause of blindness from retinal vascular disease after diabetic retinopathy. Study shows that increasing age, systemic hypertension and hyperlipidemia are the three main factors which are associated with RVO.



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Table 1: Relation between lifestyle changes and ocular diseases

Disease	Smoking	Alcohol	Diet and Supplement	Light Exposure	Physical activity
Age related Cataract	Increased risk of Nuclear cataract-9% . Subcapsular cataract -5%.	Increased risk of Nuclear sclerosis-34%. Cortical Opacity-37%. Posterior subcapsular opacity-57%.	Deficiency of vitamin A & B – nuclear & cortical Cataract . Riboflavin, Thiamin, vit E- Nuclear density. Vit C & carotenoid - Posterior subcapsular cataract. Antioxidants- Nuclear opalescence	UV-B rays – cortical cataract-21%. Wearing glasses for refractive errors- 22% reduction of nuclear cataract & 33% cortical opacity.	Physical activities decrease the risk of cataract later in life.
Age- related Macular Degeneration	Increased risk of Geographic atrophy – 33%. Neovascular ARMD -25%	Increased neovascular ARMD – 40%	Increased risk of ARMD by Saturated fat-40%. Antioxidant and zinc – 25% reduction of ARMD. Omega 3 fatty acid & lutein – 30% reduction in neovascular ARMD & 50% in geographic atrophy	Bright sunlight & UV radiations may cause damage to retinal pigment epithelium .	Regular activity-70% less likely to develop neovascular ARMD. Increased no. of blocks walked / day decreased the risk of exudative ARMD -30%
Diabetic Retinopathy	Smoking leads to increased platelet aggregation and adhesiveness and tissue hypoxia, factors hypothesized to be involved in the pathogenesis of diabetic retinopathy.		Multivitamin– protects against the progression of diabetic retinopathy. Antioxidant – prevent diabetic retinopathy.		Decreased risk of proliferative diabetic retinopathy.
Open angle Glaucoma	Increased risk of primary open angle glaucoma	Daily alcohol consumption s associated with higher eye pressure.	Increased risk of open angle glaucoma with ingestion of n-3 and n-6 fatty acids.		Dynamic and isometric exercise could lower IOP.



Table 2: Management of lifestyle disorders in ophthalmology

Diseases	Oral Medication	Kriya Kalpa	Yoga & Exercises	Others
Dry Eye	1. <i>Amalaka Rasayana</i> 2. <i>Madhuyasti powder.</i> 3. <i>Jivantyadi Ghrta</i>	<i>Tarpana- Triphala ghrta, Jivaniya Ghrta, Jivantyadi Ghrta, Daruharidra+Haridra ghrta</i> <i>Anjana- Keshanjana</i>	<i>Yoga & Asanas- Bhujangasana, Tadasana, Paschimottanasana, Sarvangasana</i> <i>Pranayam & Sitlikarana Kriya- Bhmari, Kapalbhati</i> <i>Exercise- Blinking, Palming</i>	<i>Nasya- Anu Taila</i>
Cataract	1. <i>Triphala Ghrta</i> 2. <i>Mahatriphala Ghrta</i> 3. <i>Triphaladi Ghana vati</i> 4. <i>Saptamrita Loha</i> 5. <i>Vyosadi Vati</i> 6. <i>Satavaryadi Churna</i> 7. <i>Drakshadi Ghrta</i> 8. <i>Patoladi Ghrta</i>	<i>Tarpana- Mahatriphala Ghrta</i> <i>Anjana- Nilottpaladai Anjana. Ushiradi Anjana, Sukhavati Varti, Chandrodaya Varti, Drustiprada Varti, Kokila Varti, Saindhavasi Anjana, Haridradi Vati</i>	<i>Exercise-Candle reading</i>	<i>Nasya- Anu Taila, Karanja Katphaladi Taila</i> <i>Virechana Basti</i> <i>Siravedha- of prominent veins of forehead</i>
Glaucoma	1. <i>Mahatriphala Ghrta</i> 2. <i>Nayanamrita Lauha</i> 3. <i>Punarnava Ghana Satva</i>	<i>Tarpana- Mahatriphala Ghrta</i> <i>Anjana-Triphaladi Varti</i>	<i>Exercise- Candle reading</i>	
Age related Macular Degeneration	1. <i>Siddhartak Taila</i> 2. <i>Masha Taila</i> 3. <i>Nirgundi Kalpa</i> 4. <i>Vaskadi Kasayam</i> 5. <i>Rasayana- Triphala, Kumari, Draksha</i>	<i>Tarpana- Triphala ghrta, Goghrta, Satahvadi Ghrta, Jivantyadi Ghrta</i> <i>Seka- Triphala Kwath</i> <i>Anjana- Rasanjana, Haritakyadi Varti, Sarivadi Varti</i>	<i>Yogic Kriya- Trataka, Neti</i> <i>Pranayam- Bhramari</i>	<i>Snehabasti</i> <i>Karnapuram</i> <i>Moordhtaila</i> <i>Padabhyang</i>
Diabetic Retinopathy	1. <i>Lakshadi gutika</i> 2. <i>Drakshadi Gutika</i> 3. <i>Sameera Panchaka Kasaya</i> 4. <i>Guluchyadi Kasaya</i> 5. <i>Dhanwantara Kwath</i> 6. <i>Punarnavasava</i> 7. <i>Nisamlaki</i> 8. <i>Chandraprabha Vati</i> 9. <i>Triphala guggul</i> 10. <i>Rasayana- Vasant Kusumakar Ras, Yasada Bhasma, Suvarna Vanga, Svarna Bhasm, Raupya Bhasm</i> 11. <i>Single Drugs- Haritaki, Punarnava, Sunthi & Shatavari</i>	<i>Tarpana- Potaladi Ghrta</i>	<i>Exercise- Candle reading, Palming</i>	<i>Takradhara</i> <i>Thalapothichil & Thalam</i>



Cataract- Although it is said that cataract is universal after age of 65, the onset of cataract increase due to life style changes. All patients with diabetes are at risk of early formation of cataract. Obesity is clear risk factor associated with cataract progression. Hormone replacement therapy in women increases 14% risk of cataract.

Glaucoma- According to “Beaver Dam” eye study obesity is linked to elevated pressure in the eye known as IOP which increased the risk of developing glaucoma in future. The interaction between blood pressure and IOP determines the ocular perfusion pressure which regulates blood flow to the optic nerve. Hypertriglyceridemia may lead to vascular dysfunctions which increase the risk of development of glaucoma. Glaucoma is a significant cause of irreversible blindness worldwide and IOP is risk factors for Primary open angle glaucoma. According to previous studies, elevated IOP is an expected condition in metabolic disturbances that are associated with the components of metabolic syndrome. These relations are further elaborated in Table 1 (Barbara *et al.*, 2007).

Management: Ayurveda focus mainly on three things for management of any disease like *Ahara*, *Vihar* and *Ausadha*. So this article have tried to summarize the works of different contemporary Ayurvedic ophthalmologists for enhancing knowledge of future generations regarding lifestyle related ocular diseases & their management. Different types of *Ahara* like *lohitashali*, *Mudga*, *Jeevanti*, *Patola*, *Draksha*, *Cow milk*, *Goghrita* etc are helpful to decrease the risk of eye disorders. Regular physical activity has a protective effect in relation to a number of ophthalmological conditions. *Kriya Kalpas* have a major role as a remedy for life style induced eye diseases. *Kriya kalpas* such as *Tarpan*, *Putpaka*, *Aschyotana*, *Anjana* and *Seka* etc are preventive as well as treatment modalities. *Panchkarma* also have a important role to reduce the progression of life style disorders. *Chakshuya* & *Rasayana Dravyas* described in different *Samhitas* are helpful to avoid these problems or slow down the process of ocular degeneration. The details of management protocols of different lifestyle disorders in ophthalmology is given in Table 2 (Shankar, 2015).

Discussion

Ayurvedic medications with practice of *Yogic Kriyas* & eye exercises have shown significant results in some of the eye disorders. Most of the medications used for ocular diseases have *Triphala*, *Haridra*, *Daruharidra*, *Shunthi*, *Yashtimadhu* and *Punarnava* as its main ingredient or sometimes used as a single drug . *Triphala* (*Emblica officinalis*, *Terminalia chebula*, *Terminalia bellirica*) is having adaptogenic, antioxidant, anti-cataract, immunomodulatory, anti-diabetic, anti-hypercholesteraemic, free radical scavenger and rejuvenation properties. *Haridra* (*Curcuma longa*) is having adaptogenic, antioxidant, anti-cataract, immunomodulatory, anti-diabetic, anti-hypercholesteraemic, free radical scavenger and rejuvenation properties. *Daruharidra* (*Berberis aristata*) is having anti-diabetic, anti-hyperlipidaemia, anti-oxidant, anti-inflammatory, adaptogenic, immunomodulatory, anti-cataract effect (kumar *et al.*, 2014). *Shunthi* (*zingiber officinale*) is having immunomodulatory, anti-diabetic, anti-hyperlipidaemia, anti-oxidant, anti-ageing, anti-cataract, free radial scavenger properties. *Yashtimadhu* (*Glycyrrhiza glabra*) is having anti-oxidant, immunomodulatory activity, anti-diabetic, Rasayana, anti-hypercholesteraemic enhancer of the bio- availability of drugs like actions. *Punarnava* (*Boerhavia diffusa*) is having immunomodulatory, anti-oxidant, antihypercholesterolemic, potential nutrient source, adaptogenic, immunopotentiating, Rasayana like actions. The basic concepts behind the eye exercise and *yogic Kriyas* are relaxation techniques. Relaxation of mind and eyes improves the vision. *Yogic Kriyas* and eye exercise also helps in strengthen of the eye muscles. A schedule of optimum exercise improves the efficacy of sense organ in their perception. From the previous studies on ocular management of the lifestyle related eye diseases it can be inferred that regular practice of eye exercises with *Yogic* procedures have proven to be beneficial on both preventive & curative account of these diseases. They also act at systemic level to minimize the other side effects of lifestyle disorders also. Oral medications & use of *Kriya Kalpa*, *Panchakarma* therapy, etc have further additive effects in controlling these conditions & cure it.



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