WORLD JOURNAL OF PHARMACEUTICAL RESEARCH
SJIF Impact Factor 7.523
Volume 6, Issue 9, 276-283. Review Article ISSN 2277– 7105

OPHTHALMOLOGICAL COMPLICATIONS OF MADHUMEHA (DIABETES MELLITUS) AND THEIR MANAGEMENT

Shalini Singh*[1] and A. K. Pandey[2]

[1]P.G. Scholar Dept. of Shalakya Tantra Gurukul Campus UAU, Haridwar UK-249404, India.

[2]Associate Professor Dept. of Shalakya Tantra Gurukul Campus UAU, Haridwar UK-249404, India.

Article Received on
25 June 2017,

Revised on 15 July 2017,
Accepted on 05 Aug. 2017

DOI: 10.20959/wjpr20179-9246

***Corresponding Author**
Dr. Shalini Singh
P.G. Scholar Dept. of Shalakya Tantra Gurukul Campus UAU, Haridwar UK-249404, India.

ABSTRACT

Diabetes mellitus refers to a group of metabolic disorders, leading to high blood sugar levels over a prolonged period. As of 2016 the World Health Organization (WHO) estimated that 422 million people have diabetes mellitus in this universe. It occurs throughout the world but is more common in more developing countries. The increase in rate in developing countries follow the trend of urbanisation and life style changes, including increasingly sedentary life styles, less physically demanding work and the global nutrition transition marked by increase intake of foods that are high energy dense but nutrient poor. Diabetes mellitus comes with both micro vascular and macro vascular complications in long run. One of such micro vascular complications get manifest in eyes causing diabetic retinopathy, diabetic maculopathy, diabetic cataract. It is estimated that diabetic retinopathy is the leading cause of vision loss globally of estimated 285 million people with diabetes mellitus worldwide, approximately 1/3 rd have signs of diabetic retinopathy and of these 1/3 rd have vision threatening conditions including diabetic maculopathy and diabetic cataract. Statistics shows that there is a high demand for rediscovering alternative intervention methods to control the situations.

KEYWORDS: Diabetes mellitus, Diabetic retinopathy, Diabetic cataract and Diabetic maculopathy.

INTRODUCTION

In *Ayurveda* a clear cut complication of *Madhumeha* (DM) for *Netra rogas* (eye diseases) is not mentioned but in *Sushruta Samhita Chikitsasthana* during the treatment of *Madhumeha* (DM) there is a treatment mentioned for *Netra rogas* like *Pilla roga, Arma roga, Naktandhya roga, Kacha roga, Nilika Roga and Timira roga.* So it is the only possibility which explains that *Madhumeha* (DM) aggravates complications in eyes. 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, xanthelsma, dry eye, keratopathy, neovascularisation, uveitis, cataracts, endophthalmitis, retinopathy, macular oedema, diabetic papillopathy, optic neuropathy, glaucoma, cranial nerve palsies and stroke induced vision loss. Diabetic retinopathy is a progressive blinding disease affecting 4.2 million people worldwide. Other than diabetic retinopathy, a range of ocular disease is also related to DM which may lead to vision loss like posterior subscapular cataract, etc. It has been noted that about 8% of cataract surgery due to type1 diabetes and 25% in those with type2 diabetes. Here in this article we will review the effects of diabetes on the eye and probable mode of their management in perspective of *Ayurveda.*

Ophthalmological complications of diabetes mellitus

Lids: Common complications of diabetes mellitus affecting lids are blepharitis, orbital cellulitis and recurrent styes.

Conjunctiva: Common complications of diabetes mellitus affecting conjunctiva are bacterial conjunctivitis, micro aneurysms and dry eye.

Cornea: Corneal sensitivity is commonly impaired in diabetes. The sensory deficit may predispose to other complications like keratopathy and ulcers. Keratopathy is a well described ocular complication of diabetes. Specifically diabetic patients are at higher risk of developing several complications including infections origin of fungal keratitis and along with other abnormalities like superficial punctate keratitis, recurrent corneal erosions, persistent epithelial defects and corneal endothelial damage. Keratopathy of diabetic patient will be more severe. An increase in diabetic corneal thickness has been documented in several studies, with some suggesting that this may be one of the earliest change detectable in the diabetic eye. Increase central corneal thickness in those patients was reported to be

associated with increased HbA1C and blood glucose level and severe retinal complications. Diabetes increases the risk of contact lens related microbial keratitis.

Iris: The most serious consequence of diabetes on the iris is neovascularisation. This is most commonly observed around the pupil margin but if advanced can involve the entire iris surface and angle. This finding occurs in up to 7% of diabetic eyes and up to 60% in eyes with proliferative retinopathy.

Pupil: Diabetic pupil tends to be more miotic due to an autonomic neuropathy partially denervating both the sphincter and the dilator muscles.

Uveitis: About 63% patients with idiopathic anterior uveitis are commonly found as type1 diabetic patients with half suffering from persistent posterior synechiae or cataracts.

Refractive error: Although it is well accepted that diabetic patients experience transient changes in their refractive status. Fluctuating myopia can be a presenting sign in diabetes. Collection of the sugar alcohol sorbitol in the lens, due to increased aldose reductase activity, causes the lens to swell and change its refractive power.

Cataract formation: Globally cataracts remain the leading cause of blindness affecting approximately 18 million people. Posterior sub scapular and cortical cataracts are common in diabetic patients. Snow flake cataracts are white sub scapular opacifications described in young type1 diabetic patients. This type of cataracts usually associated with a long term untreated hyperglycaemia.

Glaucoma: Glaucoma affects an estimated 70 million people worldwide of whom 6.7 million are blind secondary to the disease problem. Diabetes increases the risk of progression of primary open angle glaucoma by 1.5 fold. An increased incidence of narrow angle glaucoma was reported in type 2 diabetic patients and individuals with impaired glucose in tolerance. Neo-vascular glaucoma is a complication of PDR.

Endophthalmitis: Endogenous type of endophthalmitis is common in immunocompromised patients like diabetes mellitus and HIV where the spread of infection may be haematogenous. Common complications of endophthalmitis are decreased and permanent loss of vision, where patients may require enucleation to eradicate a blind and painful eye.

Retinopathy: The prevalence of retinopathy in the urban population with diabetes mellitus was 18%. Diabetic retinopathy is the microangiopathy affecting all the small retina vessels, such as arterioles, capillaries and venules is characterized by increase vascular permeability, ocular haemorrhages, and lipid exudates by vascular closure, mediated by the development of new vessels on the retina and the posterior vitreous surface. Diabetic retinopathy the major reason of blindness in adults of 20-74 years of age. The most consistent risk factors for the development and severity of retinopathy are duration of diabetes; diagnosis at a young age, high glycosylated haemoglobin levels and high systolic blood pressure. Diabetic retinopathy consists of a spectrum of lesions located primarily in the posterior pole of the retina within 5-10 disc diameters of the optic nerve head. It can be classified in to four stages of proliferative retinopathy any of which can include the involvement of diabetic macular oedema. Micro aneurysms are found in mild and moderate NPDR. Patients with this stage of retinopathy have only 3-9% risk of developing PDR with in 1 year. The simplified method for defining NPDR uses the 4:2:1 rule and only one finding needs to be present to qualify for this level. the retina must extensive retinal haemorrhages to quadrant of definite venous beating or prominent IRMAS in at least one quadrant and no signs of proliferative disease patient who fall into this category are considered at high risk and half go on to develop some degree of PDR within a year.

Macular Oedema: Diabetic Macular oedema is among the leading cause of persistent, severe vision less in patients with diabetic retinopathy. Lowering serum lipid level in patients with diabetic retinopathy may reduce their overall risk of vision loss. The symptoms of macular oedema are given below-

- Retinal thickening is located at or within 1/3 DD from the centre of the macula.
- Hard exudates are found within 1/3 DD from the centre of the macula. If associated with thickening of adjacent retina.
- Zones of retinal thickening 1 DD in size are present at least apart of which is within 1DD of the centre of macula.

Diabetic Papillopathy: Diabetic papillopathy is characterised by optic disc oedema in the absence of optic nerve dysfunction.

Anterior Ischaemic Optic Neuropathy: It is clinically classified as an acute optic disc swelling with afferent papillary defects associated with visual field defects. Diabetic papillopathy are at increased risk of developing non arteritic ischaemic optic neuropathy.

Wolfram's Syndrome: It is a complication of diabetes mellitus associated with progressive optic atrophy and multiple other neurological and systemic abnormalities such as neurosensory hearing loss, diabetes insipidus, anosmia and gonadal dysfunction.

Cranial Nerve Palsies: cranial nerve mono neuropathies are a well documented diabetic complication specifically those affecting the third, fourth, sixth and seventh cranial nerve.

Stroke Induced Vision Loss: It's clear that the diabetes is a significant risk factor for stroke diabetic patients who reported the history of stroke had visual field defects.

Optic nerve

Acute disc oedema: Acute disc oedema is generally a bilateral silent disease having no symptoms. On bio-microscopic examination there is diffuse oedema or severe disc swelling with soft exudates, cystoid macular oedema and macular star formation.

Non arteritic ischaemic optic neuropathy: In this condition there is sudden acute visual loss in older patients with diabetes mellitus.

Optic atrophy: In diabetic mellitus patients common causes of optic atrophy are diabetic papillopathy, optic neuropathy, previous non arteritic ischaemic neuropathy, extensive pan retinal photocoagulation and multiple nerve fibre layer infarcts.

Management: If there is no clear cut complication of *Madhumeha* (DM) mentioned for *Netra rogas* (diseases of eye) in *Ayurveda* then how can be mentioned a clear cut line of treatment for complication of *Madhumeha* (DM) in *Netra rogas* (diseases of eye). In this condition we should follow the line of treatment mentioned for *Madhumeha* (DM) to avoid the complications. *Ayurveda* focus mainly on three things for treatment of any disease like *Aahar, Vihar* and *Aushadha*. So here in this reference we should also follow the treatments mentioned by *Acharya Charaka* and *Acharya Sushruta*. As per *Acharya Charaka* there are two types of patients suffering from *Prameha.*

1. ***Sthoola Pramehi:*** Patients having obesity and strength and can be given *Shodhan* (cleansing treatment) therapy.

2. ***Krisha Pramehi:*** Patients are emaciated and weak and should be given *Brimhana* (nourishing treatment) therapy.

In both type of cases patient should be administered *Snehana* (oleation treatment) therapy. Then *Vamana, Virechana* should be administered. After elimination of *Doshas* patient should be given *Santarpana* (nourishing treatment) therapy because after Apatarpana therapy in this condition there is chances of complications like *Gulma, Kshaya, Bastishoola* and *Mootraghata.* So based on state of Agni (digestive strength) patient should be given *Santarpana* (nourishing treatment) therapy after *Shodhana* Karma.

Pathya Aahar for Prameha: *Mantha* (flour of different types of corn mixed with water), *Kashaya* (herbal decoctions), barley powder, *Avaleha* prepared of barley and such other light to digest eatables. *Yavaudana* (cooked barley), *Vatya* (barley porridge), *Saktu* (roasted corn flour) and *Apupa* mixed with the meat soup of *Vishkira* (gallinaceous) and *Pratuda* (Pecker birds) and animals inhabiting *Jangala* (arid land). Effective recipes for producing *Apatarpana* (weight reducing) effect on obese patients are useful.

Exercise and other regimens: *Pramehas* may be immediately cured by different types of strenuous exercise, unction bath, sprinkling of water over the body and application of ointment made of *Sevya (Usheera), Twak (Cinnamon), Ela (Cardamon), Aguru* and *Chandana* (Sandal wood) etc.

Medicines for Pramehas

1. Phalatrikadi Kwatha.	2. Madhwasava.	3. Dantyasava.
4. Bhallatakasava.	5. Sarodaka.	6. Kushodaka.
7. Madhudaka.	8. Triphala Kwatha.	9. Sidhu.
10. Madhwika.	11. Shilajatu Kalpa.	12. Makshika Kalpa.
13. Tuvaraka Kalpa.	14. Salasaradi avaleha.	15. Navayasa churna.
16. Loharishta.		

REFERENCES

1. Sushruta Samhita: (Motilal Banarasidas) by *Vd. Atridev Gupta,* 1984.
2. Sushruta Samhita: Text in Sanskrit with English Translation (Chowkhambha Sanskrit series) by *Kaviraj Kunjalal Bhishagratna* and *Laxmidhar Dwivedi*, July, 1998.
3. Sushruta Samhita: Text with English Translations (Chowkhambha Sanskrit series) by *Kaviraj Bhishagratna* and *Jyotir Mitra*, December, 1999.
4. Illustrated Sushruta Samhita (Chowkhambha Orientalia) by *Prof. K.R. Srikantha Murthy*, 2012; 3.
5. Sushruta Samhita:(Chowkhambha Vishwabharati) by *Dr. P.V. Sharma*, 2013.
6. Sushruta Samhita: I&II (Chowkhambha Sanskrit Sansthan) by *Ambikadatta Sastri*, 1013-14.
7. Sushruta Samhita: I,II&III (Chaowkhambha Surabharati Prakashan)by *Dr. Anantram Sharma*, 2015.
8. Sushruta Samhita (ancient Indian surgery): (Chowkhambha Sanskrit Pratisthan) by *Prof. G.D. Singhal*, 2015.
9. Sushruta Samhita of Sushruta with Nibandhasangraha commentary of Sri Dalhanacharya: (Chowkhambha Sanskrit Sansthan) by *Vd. Yadavji Trikamji Sharma Acharya* reprint, 2015.
10. The Carak Samhita of Agnivesa revised by Carak and Drdhbala with introduction by Vaidya Samrat Sri Satya Narayan Sastri Padmabhusana with elaborated Vidyotini Hindi commentary by Pt. Kashinatha Sastri and Dr. Gorakhnath Chaturvedi Volume I-II published by Chaukhambha Bharti academy Gopal Bhawan K 37/109 Gopal Mandir Lane Varanasi-221001, 2002 edition.
11. Acarya Yadavaji Trivikrama (ed.) Maharsina Punarvasunopadistatacchisyen Agnivesenapranita, Caraka Drdhabalabhyampratisamskrita Carakasamhita, Sri Cakrapanidatta viracitaya Ayurvedadipikavyakhyasamvalita Nirnaya Sagara Press, 1941.
12. Kaviratna Avinash C. Sharma P. The Charaka Samhita Sri Satguru Publications, 1913; 5.
13. Sharma, P. V. Caraka-Saṃhitā: Agniveśa's Treatise Refined and annotated by Caraka and Redacted by Dṛḍhabala (text with English translation) Chaukhambha Orientalia, 1981–1994.
14. Evans J. Causes of Blindness and Partial Sight in England and Wales 1990-91. London: HMSO.
15. McLeod BK, Thompson JR, Rosenthal AR. The prevalence of retinopathy in the insulin-requiring diabetic patients of an English country town. Eye, 1988; 2: 424-30.

16. Klein R, Klein BE, Moss SE, *et al*. The Wisconsin Epidemiologic Study of Diabetic Retinopathy. III. Prevalence and risk of diabetic retinopathy when age at diagnosis is 30 or more years. Arch Ophthalmol, 1984; 102: 527-32.
17. Hawthorne K, Mello M, Tomlinson S. Cultural and religious influences in diabetes care in Great Britain. Diabet Med., 1993; 10: 8-12.
18. Unwin N, Alberti KGMM, Bhopal R, Harland J, Watson W, White M. Comparison of the current WHO and new ADA criteria for the diagnosis of diabetes mellitus in three ethnic groups in the UK. Diabet Med., 1998; 15: 554-7.
19. Tong L, Vernon SA, Kiel W, Sung V, Orr GM. Association of macular involvement with proliferative retinopathy in type 2 diabetes. Diabet Med., 2001; 18: 388-94.
20. The Diabetes Control and Complications Trial Research Group. The effect of intensive treatment of diabetes on the development and progression of long-term complications in insulin-dependent diabetes mellitus. N Engl J Med., 1993; 329: 977-86.