Eye is the most complex organ of our body next to the brain. It has more than 2 million working parts and contributes to 80% our perceptive knowledge. The retina, which forms the neural coat of the eye, consists of millions of cells packed together in a tightly knit network spread over the surface of the back of the eye. The conversion of light into neural signals occurs at the level of retina. Structures in the macula (i.e., the central part of retina) are specialized for high-acuity vision due to highest density of cone photoreceptors, absence of vasculature. Macular disorders affect the photopic vision especially the central vision and make activities involving fine details like reading, driving etc difficult.

Cystoid macular oedema (CMO) represents a common pathologic sequel of the retina and occurs in a variety of pathological conditions such as intraocular inflammation, central or branch retinal vein occlusion, diabetic retinopathy and most commonly following cataract extraction. A 2006 study of 4,800 patients in rural India found that 3.36% had bilateral severe sight impairment, and macular oedema (including cystoid macular oedema) accounted for 3.79% of these cases.¹
Aims and Objectives

- To explain the disease in terms of its samprapthi in Ayurveda.
- To derive a chikitsa karma for cystoid macular oedema.

Cystoid macular oedema

Cystoid macular oedema (CMO) is fluid accumulation in cyst-like spaces in the outer plexiform layer (Henle's layer) of the macula. The edema is termed "cystoid" as it appears cystic; however, lacking an epithelial coating, it is not truly cystic. The underlying cause is thought to be disruption to the blood-retinal barrier (BRB). Retinal cells are displaced by the cysts, so the fluid affects both cell function and cell architecture.

CMO is the common manifestation which varied macular pathologies culminate into. The pathologies known to lead into CMO are:
1. Postoperative complication: following cataract surgery, keratoplasty
2. Ocular inflammatory diseases: Pars planitis, posterior uveitis, Behcet’s disease
3. Retinal vascular disease: central and branch retinal vein occlusions, idiopathic retinal telangiectasia
4. Retinal dystrophies: retinitis pigmentosa
5. Drug-induced changes: topical adrenaline (epinephrine) 2% particularly in patients without a lens.

The vitreous, retina, retinal pigment epithelium (RPE) and choroid receive their circulation through the retinal and choroidal vasculature. This is dependent on an intrinsic balance amongst the osmotic force, hydrostatic force, capillary permeability and tissue compliance in the vasculature. Once imbalance occurs, an accumulation of fluid is seen in cystoid spaces within the inner layers of the retina. Vitreomacular traction is another factor that causes the release of inflammatory factors such as VEGF and platelet-derived growth factor (PDGF). This results in breakdown of the blood-retinal barrier, leakage of fluid from the retinal capillaries and this causes cystoid macular oedema.

CMO is usually self-limiting and spontaneously resolves within 3-4 months, depending on the cause involved. This resolving of pathology may be aided by medical (like NSAIDs, corticosteroids, Carbonic anhydrase inhibitors) or surgical treatments (like laser photocoagulation, pharmacological vitreolysis agents, vitreectomy). However, if the oedema is chronic (more than 6-9 months) permanent damage to photoreceptors with retinal fibrosis can occur.

CMO according to Ayurveda

According to the science of Ayurveda, if the pathology of CMO is taken into concern, the concept of Shopha (ekanga) comes into play. However, on considering the clinical features, the disease falls into the umbrella of timira.

Samprapthi of CMO

Nidana/Nidanarthakara Roga

Vitiation of kapha and pitta in netra

Shopha in netra

Avarana to prana vata in netra

Timira

Samprapthi ghatakas:

Dosha- Prana Vata
Alochaka Pitta
Tarpana Kapha

Dushya- Rasa, rakta
Agni- Rasa & rakta dhatwagnimandya
Srotas- Rasavaha, raktavaha
Srotodushti- Atipravrutti
Udbhavasthana- Amapakvashaya
Sancharasthana- Netra
Vyaktasthana- Drishti
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The various nidanas and nidanarthakara rogas cause a mandya in rasa and raktadhatwagni. This leads to excess formation of mala from these dhatus in the form of vikruta kapha and pitta. Pitta being sthanika dosha here gets more intensely vitiated and an increased sara, drava and teekshna guna of pitta causes further vilayana of the sanchita kapha. This produces the shopha in drishti. The dushita kapha and pitta further cause avarana and hamper the functioning of prana vata in netra. The prakupita doshas reach triteeya patala bringing about manifestation of timira lakshanams that simulate the clinical presentation of cystoid macular oedema.

Treatment for CMO

Keeping these two concepts in mind, the treatment for CMO must be planned. A spectrum of treatment options come to avail here, wherein shodhana and drishtiprasadana chikitsa are the pivots:

- Virechana
- Nasya
- Chakshushya Basti
- Shirodhara
- Kriyakalpas: netraseka, tarpana, putapaka
- Shamanaushadhis

Virechana

Dravyas for virechana:
- Gandharvahastadi eranda
- Triuruth lehya

Drishti is pitta sthana. Hence virechana is the first line of treatment for most drishtigata rogas. Here, it clears the avarana of kapha and pitta to vata dosha primarily while maintaining vata at status quo.

Nasya

- Shodhana nasya dravyas:
  - Guda nagara nasya
  - Gavashakrit kwatha nasya
- Shamana nasya dravyas:
  - Nimbadi taila
  - Guduchyadi taila
  - Durvadi taila
  - Anu taila

Nasya is the line of treatment at the outset for all jatrurdhwa vikaras. Here, the shodhana nasya is administered for the shodhana of the avaraka doshas while the shamana nasya is given with the aim of bringing pitta-vata shamana in drishti.

Basti

- Chakshushya basti yogas:
  - Sthiradi basti(/Balapotaladi basti)
  - Mustapathadi yapana basti

Basti is the agrya chikitsa for vata dosha. Retina being majorly a neurological entity it's functioning can be attributed mainly to vata dosha. Also, in the samprapthi of cystoid macular edema that we have deciphered, the role of prakupita vata is seen.

Shirodhara (Takradhara)

- Takradhara with Triphala+Musta+Malaki kashaya sadhita takra

Takradhara on shiras is claimed to be a unique remedy for disorders of shiras, karna and netra. Hence it is employed here, for added benefit. In cases of macular oedema secondary to hypertension (hypertensive retinopathy), takradhara proves beneficial in managing the cause i.e hypertension as also to the vision.

Kriyakalpas

Seka

Dravyas for seka
- Triphala kashaya
- Brihat panchamoola kashaya
- Dashamoola kashaya
- Punarnava kashaya
- Shatavari ghrita

Tarpana

Dravyas for tarpana
- Triphaladi ghrita
- Mahatricophaladi ghrita
- Jeewanthi ghrita
- Shatavari ghrita
**Putapaka Dravyas for putapaka**

- Ajamamsa+Punarnava+Guduchi+Vasa+
  Kathaka+Yashtimadhu

The above formulation can be used just as mentioned or in different combinations among the ingredients, aja mamsa being a must. Putapaka is always administered after the course of tarpana.

The kriyakalpas have a more specific action locally i.e at the target organ- netra. They are designed for better intra-ocular drug delivery. Here, seka is mainly aimed at serving as shophahara while tarpana and putapaka are meant for ensuring normal functioning of vata and to provide bala to the chakshu.

**DISCUSSION**

Breakdown of the physiological blood retinal barrier leading to leakage of fluid in macula is the ultimate cause of cystoid macular oedema. The higher quantity of fluid causes it to accumulate in cyst like spaces, giving it the typical cystoid appearance.

Oedema, which is the terminus of the pathology in this condition has to be understood as ekanga shopha. Though kapha(also pitta, due to drava, sara guna) is the predominant dosha involved in forming shopha here, the lakshanas manifesting are that of vataja timira. This is where the role of avarana janya vata prakopa comes into picture.

The modern line of management which includes intra-vitreal injections and implants, laser photocoagulation as also vitrectomy are themselves potential causes of visual loss. A very delicate balance which expresses the ratio of benefit and risk forms their judgment parameter to make a choice based on the maxim “benefit outweighs the risk”.

**CONCLUSION**

A sound understanding of the fundamentals of Ayurveda stands pivotal for a practitioner of any branch of Ayurveda including Shalakya'Tantra. The disease picture may seem to be obscure from the standpoint of Ayurveda, when one looks at the available diagnostic evidences and presenting symptoms. However the answers lie right in our fundamental principles. The only need for us is to identify with them.

The advancement in Modern Science in terms of technology and symptom database indeed makes our work easier in terms of understanding the disease cystoid macular oedema, and its pathological process. However the role of our rogajanakasamprapthi remains unbowed and novel even then. Even if one didn’t have the support of information from Modern Medical Science, the treatment plan arrived at would still stand on the same principles as explained above. This is because the manifestations would still point at a Vataja and Triteeyapatalagatatimira. Indriyas are kaphasthana, however drishti in particular is a pittasthana. Hence the vikruti of kapha and pitta are essential pre-requisites that journey the samprapthi of any netraroga, which in turn means that their correction is the first step in almost all netrarogas. Once they have been corrected, the vata which is hampered should be taken care of. In this way it ultimately comes down to the same logic as deciphered even with the help of the database of Modern Science. At the end, it still is about knowing the play of Tridoshas in their two forms-prakruta and vikruta.

**REFERENCES**

Eshwari et al.: Understanding Cystoid Macular Oedema in Ayurveda and its Brief Management


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