KRIYAKALA VIVECHANA IN KAPHAJA TIMIRA (SENILE CATARACT)-A SPECULATIVE STUDY

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ABSTRACT
Timira is one among the Netra Roga specifically mentioned in Dristigata Roga which means darkness. According to different Acharyas Timira is classified into Vataja, Pittaja, Kaphaja and Sanmipathaja. Considering the different stages, Kaphaja Timira can be correlated to cataract which is classified under avoidable blindness. Cataract is a multifactorial disease where there will be opacification of lens leading to visual disturbance followed by blindness in mature stages. The concept of Kriyakala is explained by Acharya Susruta in the context of vrana to understand the prognosis of the disease and it guides us when to intervene. Kriyakala can be categorized as Prakruti and Vaikrutha. As cataract comes under the avoidable blindness the knowledge of Kaphaja Timira with special reference to Senile cataract through Kriyakala aids in prevention and better management. In this article the significance of Kriyakala in relation to Kaphaja Timira prevention and management in the respective stages is described. Pathophysiology of cataract specially in the ageing lens is analysed in understanding the Kriyakala of the Kaphaja Timira.

KEYWORDS: Timira, cataract, Kriyakala, Ageing lens, Senile cataract.

INTRODUCTION
Timira is a Drsitigata Roga exhibits symptoms according to the dosha predominance in general exhibiting blurred vision as a cardinal symptom. Cataract is a cloudy or opaque area in the normally clear lens of the eye.[1] Normally the lens focuses light on the retina, if the lens is clouded by a cataract light is scattered so the lens cannot focus properly leading to visual disturbance.[2] Cataract is the major contributor for visual impairment and blindness in adults worldwide. According to the National blindness and visual impairment (NPCB and VI) survey 2015–2019, cataract contributes to 66.2% of blindness and 71.2% of visual impairment in the population above 50 years in India.[3] Kriyakala Chikitsaavasara-the time that denotes necessity of treatment.[4] It is a concept where evolution of disease is explained in detail for proper planning of the treatment. It is of two types Prakruti refers to variation of dosha in relation to day, age, night and season. Vaikrutha kriyakala explains the evolution of disease starting from Nidana Sevana till Upadrava manifestation and suitable management to adopt at each stage. The above is divided into six stages and termed as Shadkriyakala. Ayurvedic science promotes the concept of subduing the disease at the preliminary stage leads to good prognosis and prevents further progression of a disease. Proper knowledge on the concept of Kriyakala helps in proper treatment of the disease at right time. As in immature stage of Senile cataract does not have a definitive treatment better understanding and early detection of the pathology will improve the quality of the treatment planning.

KRIYAKALA
Kriyakala or Shadkriyakala is explained by Acharya Susruta in Vrana Adhyaya. It is comprised of two words i.e. Kriya or Karma/Pravrutti means the Chikitsa to be adopted in form of Aushadha, Ahara and Vihara to correct the Doshic vitiation. Kala is appropriate time (time to intervene) to adopt proper measures in terms of disease stages.[5] Acharya charaka has explained in terms of Sanchaya, Prakopa and Prasara that can be taken or understood as Prakrita kriyakala.[6]

Classification

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Prakrita kriyakala also called Swasthya Kriyakala is explained by Acharya Vagbhata[7] which deals with physiological variations of Doshas with respect to season, age, day, night etc. this is a natural process occurring against the external environmental factors which will remit on its own. Adopting Dinacharya and Rtucharya helps in pacifying the Doshas and further development disease will not happen.

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### Sanchaya

Sanchaya can be taken as an incentive stage of a disease, instead of circulating freely the Doshas are stagnated in its own place. In this stage ill-defined or vague symptoms of the Chaya Dosha may be seen.

Aswabhavika is due to Nidanas like Prajna Parada, Mithyahara vihara and Asathmya Indriya Samyoga which causes Dosha Vrudhi.

Prakopa

Further the accumulated Doshas in its place gets excited or provoked by factors such as Ahara, Vihara and Charya followed. Acharya Susruta has explained provocative factors for each Dosha in detail.

Prasara

Prasara means Vimarga Gamana, where the Prakupita Dosha spread from its Sthana to other parts of the Sharira.

Swabhavika is due to environmental or physiological changes like seasons and age factor. In Senile cataract age contributes as a Sanchaya factor.

<table>
<thead>
<tr>
<th>S.no</th>
<th>Stages</th>
<th>Dosha progression</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>Sanchaya</td>
<td>Accumulation of Dosha in Svasthana</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Quantitative increase of Dosha,Dhatu and Mala</td>
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<tr>
<td>2</td>
<td>Prakopa</td>
<td>Dosha vitiation in Svasthana</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Quantitative and qualitative increase of Dosha,Dhatu and Mala</td>
</tr>
<tr>
<td>3</td>
<td>Prasara</td>
<td>Movement of Dosha from its place through different Srotas</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Spread and moves in Urdwagati</td>
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<tr>
<td>4</td>
<td>Sthana samsraya</td>
<td>Localization in weak areas (kha vaigunya)- i.e, Patala of Netra</td>
</tr>
<tr>
<td></td>
<td></td>
<td>where Dosha-Dushya Samurchana happens</td>
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<tr>
<td>5</td>
<td>Vyakhti</td>
<td>Signs and symptoms of disease will be seen</td>
</tr>
<tr>
<td>6</td>
<td>Bheda</td>
<td>Dosha involvement and differentiation at Dhatu level and manifestation of Upadrava</td>
</tr>
</tbody>
</table>

### DOSHA, AHARA AND VIHARA

<table>
<thead>
<tr>
<th>DOSHA</th>
<th>AHARA AND VIHARA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vata</td>
<td>Katu, Tikta and Kashaya rasas</td>
</tr>
<tr>
<td></td>
<td>Laghu, Ruksha, Sheeta Guna Aharas</td>
</tr>
<tr>
<td></td>
<td>Patra shaka, Vaillura, Varaka, Uddalaka</td>
</tr>
<tr>
<td></td>
<td>Atiyyavama, Ati Maithuna, Langana, Rathri</td>
</tr>
<tr>
<td></td>
<td>Jagarana, Vegadharana (Vayu, Mutra, Purisha, Asru)</td>
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<tr>
<td></td>
<td>Pratapa, varsha rtu, Sayankala, Sheeta kala</td>
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<tr>
<td>Pitta</td>
<td>Katu, Amla and Lavana rasa ahara</td>
</tr>
<tr>
<td></td>
<td>Tikshna, Ushna, Vidahi, Laghu Guna ahara</td>
</tr>
<tr>
<td></td>
<td>Pinyaka, Kidatha, Sarasa, Haritaka, Dadhi</td>
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<tr>
<td></td>
<td>Athapa sevana, Ati Langana</td>
</tr>
<tr>
<td></td>
<td>Grishma and Sarad Rtu, Madhyarathiri</td>
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<td></td>
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</table>

Vyadhi Kryakala helps in understanding the Doshic involvement in manifestation of a disease and its complication. Explained in following stages Sanchaya.

<table>
<thead>
<tr>
<th>Factors</th>
<th>Kapha</th>
<th>Pitta</th>
<th>Vata</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vaya</td>
<td>Bala</td>
<td>Madhyama</td>
<td>Vriddha</td>
</tr>
<tr>
<td>Ahoratri</td>
<td>Purvanne, Prathamavathiri</td>
<td>Madhyana, Madhyarathiri, Rathri ante</td>
<td></td>
</tr>
<tr>
<td>Bhukta</td>
<td>Prathamavathiri</td>
<td>Dvithiya Vipaka</td>
<td>Tritya Vipaka</td>
</tr>
<tr>
<td>Ritu</td>
<td>Vasantha</td>
<td>Sarad</td>
<td>Varsha/pravrut</td>
</tr>
</tbody>
</table>

Swabhavika

Swabhavika is due to environmental or physiological changes like seasons and age factor. In Senile cataract age contributes as a Sanchaya factor.
Susuruta describes with an example “Mahanudaka sanchaya atiruddha”-overflowing of water from the overfilled dam (or) “Kinvaudaka pista samavaya”- Kinva Pista(starch) when kept in increased moisture, e.g.  An increased predisposing disease may cause another disease. Likewise, the Prakopita Dosha gets excited and overflows from its Sthana. To move from one place to another Vata Dosha is a prime factor involved for the movement of the other Dosha. The Prakopita either singly or two or all the three doshas along with Rakta can leave its Sthana and move to different parts and cause a disease. Based on Permutation and combination of Prasara of Dosha can be fifteen in number. Wherever the Prakopita Dosha travels it may cause disease in that particular Sthana.

In kaphaja Timira kapha dosha gets vitiated in Sarva Sarira due to Nidanas and in the Svasthana due to age related changes in the lens.

**Sthana samsraya**

This stage represents the prodromal phase or phase of Purvarupa. The provoked Dosha gets localised in specific place and shows prodromal symptoms of the disease pertaining to those structures.

Dalhana commentary describes that this stage happens due to Sroto vaigunya or if there is any Dusti in the Srotas leading to Dosha-Dusya samurchana i.e. it acts at the Dhatu level. Here it can be taken as age related changes happening in the Dristi that aids in Sthana samsraya.

Sthana Samsraya can happen at different levels of Patala in Netra and leads to Kaphaja Timira. At Purvarupa level person might only experience Avila Darsana (Blurred vision) or it may be asymptomatic.

E.g.: If the Sthana samsraya of Dosha happens in the Urdhwa Jatra like Netra it causes Abhisyandhadi Rogas and Purvarupa like Asra, Kandu, Upadeha will be seen.

**Vyakhti**

In this stage the disease is fully developed as a result of Dosha-Dusya samurchana and the symptoms are clearly manifested. Characteristic features of a disease will be seen like Shopha, Jwara etc., E.g. Prakopita Kapha in Netra Patala causes Kaphaja Timira. According to Patala in Prathama patala the person experiences Ayaktika Darshana (Blurred vision).

If Dosha lodges in Dwihiya Patala it is termed as Timira. In Tritya Patala it is termed as Kacha and in Chathurtha Patala it is termed as Linganasha.

**Bhedha**

When the disease is not treated at Vyaktika avastha then it will lead to Bheda avastha where the disease has progressed to chronic stage and there might be manifestation of Upadravas and it will be difficult to treat at this stage. This stage to be taken seriously because the predisposing disease may cause another disease (Nidanarthakara Vyadhi).

Here it can be considered as the progression of the disease like Kacha and Linganasha.

**Timira**

Timira word derivation states “Timi kledane aadri bhavaha iti yavatthaha” means increased moisture content. It is one among the Dristigata roga possessing blunness of vision as a prime symptom Nidana such as Ushna Abhitaptasya Jala Pravesha (Change of environmental temperature), Agni Suryadi Tejasa Avalokana (Visualizing bright illumination), Nidra Viparyaya (Sleep disturbances), Kopa (Anger), Abhigata (Injuries-Head), Katu, Amla Ahara Sevana leads to causation of disease. Based on the Dosha dominance Timira can be classified as Vataja Timira, Pittaja Timira, Kaphaja Timira, Sannipataja Timira. Based on the placement of Doshas(Sthana samsraya) it can be Prathama patala gata, Dwitiya patalaga, Tritiya patalaga or Chathurtha patalaga Timira. Kaphaja Timira has been focused as cataract signs and symptoms correlates with the same.

**Kaphaja Timira Samprapthi**

<table>
<thead>
<tr>
<th>Due to the Kaphakara Nidanas</th>
<th>Agni mandya leading to Kapha Pradhana Tridosha Prakopa</th>
<th>Doshas move in Urdwagamana through siras</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sthanasamsraya in First and second patala</td>
<td>Kaphaja Timira</td>
<td>If not treated properly progresses causes Kacha and Linga Nasha</td>
</tr>
</tbody>
</table>

**Lakshanas of Kaphaja Timira**

Lakshanas of Kaphaja Timira According to Acharya Susuruta explained as follows

- Snigdha swetham cha pasyathi-visualizes everything white and glossy
- Gaurva, Chaumara Swethaprabha prathamani- visualizes everything white as if covered by clouds
- **Pasyeth Sukshma atyartham** - Visualizes minute objects with difficulty
- Visualizes Moving clouds in clear sky (vyabre cha abrasamplavum)
- **Salila plavithaniva parijadyani** - visualizes objects as if immersed in water According to Astangasangraha.[13]
- **Snigdham Swetham cha pasyate** - vision becomes Snigdha.
- **Sankha, Indu, Kunda, Kusuma, Kumudaivichitham** - visualizes objects as if covered by Conch shell, Moon, Jasmine, White lily, Lotus.

**Cataract**

A cataract is a clouding or opacification of the normally clear lens of the eye or its capsule that obscures the passage of light through the lens to the retina of the eye.[14] It can be bilateral and vary in severity. The disease process progresses gradually without affecting daily activities early on, but with time, especially after the fourth or fifth decade, the cataract will eventually mature, making the lens completely opaque to light interfering with routine activities. Senile cataract is one among the commonest type of acquired cataract, also called as age-related cataract occurs usually above the age of 50 years. Risk factor includes Age, Hereditary, Smoking, Ultraviolet radiation, Dietary factors (deficiency of Vit A, C, E).

**Types of senile cataract**
- Cortical cataract
- Nuclear cataract
- Posterior subcapsular cataract

**Pathophysiology of cataract**

About 33 percent of lens composition is formed by proteins, crystalline like alpha, beta and gamma, where Alpha crystalline play an important role in preserving the lens transparency by maintaining the protein in its native state and it is rich in free radical scavenging capacity.[15] Pathophysiology runs in and around these proteins and crystallins. Many degenerative processes denature and coagulates the protein leading to loss of transparency.

Various mechanism that takes place in cataract formation are[16]
- Disturbances at the level of primary lens fibre formation (Congenital cataract)
- Metaplasia of lens epithelium (Subcapsular cataract)
- Hydration of cortical layer (Cortical cataract)
- Deposition of pigments and hardening of lens (Nuclear cataract)

**Changes seen in ageing lens**[17]
- Biochemical changes results in increased light scattering in the lens (Deeper in cortex than the nucleus)
- Due to biochemical changes lens relative hydration is lost and hydration of lens takes place
- Lens thickness increase leading to increase in axial length of the lens and reduced elasticity of lens
- Changes in the crystallins such as deamidation, glycation encouraging unfolding and insolubility of the crystallins (Denaturation of proteins-disturbance to the native state of protein)
- Accumulation of denatured proteins causes progressive hardening of the lens (Greater in lens nucleus)
- Fall in the free radical scavenging capacity of alpha crystallins

Because of many biochemical changes lens loses its transparency leading to cataract formation.

**With Increasing age**

- Active transport pump mechanism of lens reduces
- Reduced oxidative reaction (fall in free radical scavenging property)
- Disturbance in Na+/K- ratio
- Level of amino acids decreases
- Hydration of lens fibres
- Decreased protein synthesis
- Denaturation of lens protein
- Opacification of lens fibres

**FIG. 1: Flow Chart Depicting Cataract Formation.[18]**
DISCUSSION ON VIVECHANA OF KRIYAKALA IN KAPHAJA TIMIRA WITH SPECIAL REFERENCE TO CATARACT

As normal physiology production of new lens fibres over the old fibres and loss of organelles in the old fibres age can be understood as Sanchaya (Swabhavika) where Vata and Kapha are involved predominately. Prakopa avastha as the further progression of age along with the Nidana and Charya followed by the individual results in biochemical changes in the lens leading to denaturation of proteins in the lens, as in Vruddha avastha Vata Doshaplays an important role and it is Prakopa avastha. Next it Develops to Prasara avastha through different layers the changes continue to happen resulting in reduced free radical scavenging property of the crystallins lens. This leads to loss of transparency and hardening of lens. It is greater in lens nucleus than in cortex as the superficial cortex still retains the free radical scavenging property. The change in the lens fibres can be understood as Kapha gets hardened by Vata in the nucleus layer whereas in cortex that does not happen as it retains scavenging property. The layer where the cataract changes can happen be termed as Shana samrasraya either in cortex, subcapsular or nuclear. All symptoms such as blurred vision, glare, halos, black spots in front of eyes, diplopia will be seen in Vyaktha Avastha and grading of cataract can be done such as Immature and mature stage. In Bheda avastha Upadrava like loss of vision will be seen where the Dosha reaches the fourth Patalas and termed as Linganashasthe hyper mature stage of cataract.

CONCLUSION

Senile cataract being one among the avoidable blindness managing the disease by prevention and early treatment plays an important role. Understanding and framing the treatment through Kriyakala helps us to provide better treatment at the earliest. Managing Kaphaja Timira at stage of Shana samrasraya will prevent further progression of Dosha to next Patalas in turn preventing vision loss. As the disease progresses treatment becomes difficult with bad prognosis “Earlier the treatment better the prognosis”.

REFERENCES

1. Cataract www.aoa.org; URL: https://www.aoa.org/healthy-eyes/eye-and-vision-conditions/cataract [Internet]-American Optometric Association
2. Cataract www.aoa.org; URL: https://www.aoa.org/healthy-eyes/eye-and-vision-conditions/cataract [Internet]-American Optometric Association
8. C.Dwarakanatha, Introduction to Kayachikitsa, Chapter 7, Chaukhambha Orientalia; Varanasi, 96.
9. C.Dwarakanatha, Introduction to Kayachikitsa, Chapter 7, Chaukhambha Orientalia; Varanasi, 98.
10. Dr. Vishak M.D, Dr. Veena Shekar, Dr.Sujathamma K.A. review of Senile Cataract(Timira) and its management. International Ayurvedic Medical Journal, Sep-Oct 2018; 3(5). ISSN:2456 5091
11. Dr. Vishak M.D, Dr. Veena Shekar, Dr. Sujathamma K.A. review of Senile Cataract(Timira) and its management. International Ayurvedic Medical Journal, Sep-Oct 2018; 3(5). ISSN:2456 5091