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"An Integrative Review of Kukunaka's Influence on Ophthalmic Neonatorum through Ayurvedic and Modern Perspectives"

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ABSTRACT :

Kukunaka, a traditional Ayurvedic term, refers to an eye disorder affecting neonates, closely resembling Ophthalmia Neonatorum in modern medicine. Kukunaka is explained as Netra Vartmagata vikara which is Kaphapradhana Tridoshajavyadhi particularly seen in the Ksheerapa period. Ayurvedic texts emphasize dietary and lifestyle factors, such as maternal diet and sleep patterns, as causative elements. Ophthalmia Neonatorum is an inflammatory or infectious condition primarily caused by bacterial infections like Chlamydia trachomatis and Neisseria gonorrhoeae. The condition is marked by symptoms such as excessive lacrimation, purulent discharge, and eyelid swelling in neonates. Treatment in Ayurveda involves modalities like Aschotana (eye drops), Parisheka (eye wash), and medicinal lepas (ointments), which parallel modern approaches using antibiotic eye drops and ointments. This review explores both Ayurvedic and modern medical perspectives on Kukunaka and Ophthalmia Neonatorum, highlighting the importance of preventive care, early diagnosis, and integrated therapeutic interventions.

KEY WORDS: *Kukunaka,* Ophthalmia neonatorum, *Netra, Stanyadushti.*

INTRODUCTION :

Acharyas have given prime importance to Panchendriyas. Netrendriya is one of the indriya among Panchendriyas. Kukunaka is a disease which affects the eyes in neonatal period. It is explained as Netra Vartmagata vikara which is Kaphapradhana Tridoshajavyadhi particularly seen in the Ksheerapa period. The clinical features explained in Ayurvedic classics like Abhikshamasrasravam (excessive lacrimation), Shotha (eyelid swelling), Paichilya (stickiness), Netramatikandu (itching in eye) is suggestive of infectious disease of eye. In contemporary science the same features are explained under the heading of Ophthalmia Neonatorum.

Ophthalmia neonatorum refers to any conjunctivitis occurring in neonates. Most commonly infective in origin[1]. A neonate, is a child under 28 days of age. During these first 28 days of life, the child is at highest risk of neonatal infections. In India the prevalence of ophthalmia neonatorum is 0.3 to 33 % and varies in the world from 0.9 to 21% considering that the prevalence of this condition is high in our country (30%) and that it is associated with grave complications[2].The infection may be chlamydial, gonococcal or due to Herpes simplex virus. Clinical Features are watering and purulent discharge from both eyes in the first few days of life.

Acharyas in Ayurveda have described various treatment modalities for eye care, such as Aschotana, Parisheka, Anjana, application of Choorna, and Pralepa. Aschotana, which refers to the instillation of eye drops, is comparable to the use of ophthalmic drops in modern medicine. Aschotana may also involve the use of medicated ghee preparations like Triphala Ghrita or Giloy Ghrita. Additionally, Pratisaran (local application) with Trikatu Churna (a powder made of three pungent spices: black pepper, long pepper, and ginger) is also used[3].Other Ayurvedic treatments for the eyes include eye washes using decoctions made from herbs like Amalaki (Indian gooseberry), Jambu (Java plum), Aamra (mango), Eranda (castor plant), and Varuna.In modern science, the treatment of ophthalmia neonatorum typically involves the use of various antibiotic eye drops. Common prophylactic treatments include silver nitrate eye drops, as well as erythromycin or tetracycline ointments.Considering the importance of the eye as a vital sensory organ, I have chosen to focus on a subject related to eye care.

CONCEPTUAL STUDY OF KUKUNAKA:

MATERIAL:

Literature review

Literature review of the topic is done from Kashyap Samhita, Sushruta Samhita, Ashtanga Sangraha, Ashtang Hridaya, Madhava Nidana, Bhavaprakasha, Sharangadhara Samhita and Modern Textbook of Pediatrics.

Ayurvedic Concept

Kukunaka Hetu (causes of Kukunaka) –

यदा माता कुमारस्य मधुराणि निषेवते ।मत्स्यं मांसं पयः शाकं नवनीतं तथा दधि ।।३।।
सुरासवं पिष्टमयं तिलपिष्टाम्लकाञ्जिकम्।अभिष्यन्दीनि सर्वाणि काले काले निषेवते ।।४।।
भुक्त्वा भुक्त्वा दिवा शेते विसंज्ञा च विबुध्यते।तस्य दोषाः प्रकुपिता द्वूरं गत्वा च तिष्ठते ।।५।।
दोषेणावृतमार्गायास्ततः स्तन्यं च दुष्यते ।।[4]

का. खि. 13/3-6

Aaharaj (Diet) Hetu:

- Consumption of too much sweet – Causes diseases due to vitiation of kapha dosha.
- Leafy vegetables
- Fish and meat – Mansahar have gunas like ushna, tikshna and abhishyandi which causes aggravation of pitta dosha and rakta dhatu.
- Milk & milk products like butter, ghee – Dugdhahar causes abhishyand which is responsible for vitiation of kapha & rakta.
- Products of flour
- Grinded tila.
- Sour product like kanji - Among six rasas, amla is more prone to eye diseases. Vidahi items also leads to eye diseases.

Viharaj (Mode of life) Hetu:

- The eyes are naturally adapted to function in the presence of sunlight and to rest in its absence. Disrupting this balance by engaging in activities like *sleeping during the day* (Divaswap) or *staying awake late at night* can negatively impact eye health.
- In Ayurveda, *Divaswap* is considered to be *"Trishokar"*—which means it can lead to the aggravation of the three doshas (Vata, Pitta, and Kapha), potentially causing various health imbalances. Therefore, maintaining a proper sleep-wake cycle is essential for the well-being of the eyes and overall health

Table no.1-Causative factors of Kukunaka as per various Samhita's[4,5,6,7].

s.no.	Name of Samhitas	Causative Factor
1.	*Sushruta Samhita*	*DustaStanya due to vitiated Vata, Pitta, Kaph & Rakta*
2.	*Kashyapa Samhita*	*DustaStanya due to vitiated Kapha, Rakta*
3.	*Ashtanga Hridaya*	*DantotpattiNimitaj Vyadhi*
4.	*Yogratnakar*	*Ksheer Dosha janya*
5.	*Harita Samhita*	*KshaarYuktaDugdha*
6.	*Ravanakrita Kumartantra*	*Ksheer Dosha janya*

Causes of Ophthalmia Neonatorum

Infectious causes[8]

Bacterial Causes

- Chlamydia trachomatis (most common)
- Neisseria gonorrhoeae (a severe cause requiring prompt diagnosis and treatment)
- Staphylococcus aureus
- Pseudomonas aeruginosa (can cause rapid corneal ulceration and perforation)
- Streptococcus species (including S. haemolyticus, S. pneumoniae)
- Other bacteria: Klebsiella, Proteus, Enterobacter, Serratia, Eikenella corrodens

Viral Causes

- Adenovirus
- Herpes simplex virus

Chemical Conjunctivitis

Often resulting from exposure to irritating substances such as household cleaners, sprays, smoke, smog, and industrial pollutants.

SADHYA- ASADHYATVA - All the types of Kukunaka are curable by medicine. All Acharya have mentioned medicinal treatment for Kukunaka.

SAMPRAPTI OF KUKUNAKA:

Samanya Samprapati –

Pathogenesis of eye diseases – Samprapti can be explained as pathological changes evoked by etiological factors, leading to manifestation of sign and symptoms of diseases. The vitiated doshas, as they course through the vessels and reach upward, produces excessively formidable diseases in different parts of the eye.

प्रदुष्टदोषसंज्ञं तु यदा पिबति दारकः ।।६.२।।लवणाम्लनिषेवित्वान्मातापुत्रौ रसादिह।
आहारदोषात्तस्यास्तु बालस्यानन्नभोजिनः ।।७।।अनुप्रवेशादाक्षेपादुष्णसत्त्वावनादपि ।
जायते नयनव्याधिः श्लेष्मलोहितसंभवः ॥८॥[4]

का. खि. 13/6-8

When a mother consumes food vitiated by *doshas* or rich in *salty* and *sour tastes (rasas)*, these dietary imbalances can affect her breast milk. Since the infant is entirely dependent on her milk, the abnormalities from the mother's diet are passed on to the child. As a result, due to the vitiation of *Kapha* and *Rakta (blood)*, the child may develop eye disorders, which can be exacerbated by the body's natural convulsive reactions.

Pathogenesis

- Infection can occur through:
    - Infected birth canal during vaginal delivery
    - Transmembrane transmission
    - Transplacental transmission

Pathology

Gross Findings[9]

- Conjunctival injection
- Mucopurulent or non-purulent discharge
- Pseudomembrane formation
- Chemosis
- Eyelid edema

Microscopic Findings[9]

- Mild spongiotic reaction pattern
- Stromal infiltration by polymorphonuclear leukocytes, plasma cells, mast cells, and lymphocytes

Kukunaka roop (signs of Kukunaka)-

According to kashyapa Samhita

अभीक्ष्णमस्रं स्रवते न च क्षीवति दुर्मनाः। नासिकां परिमृद्राति कर्णं वाञ्छ(ह्य) ति दुःखितः ॥ ९॥
ललाटमक्षिकूटं च नासां च परिमर्दति । नेत्रे कण्डूयतेऽभीक्ष्णं पाणिनां चाप्यतीव तु ॥
स प्रकाशं न सहते अश्रु चास्य प्रवर्तते। वर्त्मनि श्वयथुश्चास्य जानीयात्तं कुक्कुणकम् ॥११॥[4]

का. खि. 13/9-11

- Excessive itching of eyes -The child rubs eye balls, nose & forehead area, desires to touch the ear, is seized with sorrow, (his) eyes have severe itching, thus, he excessively scratches the eyes with hands,
- Photophobia
- Excessive lacrimation
- Swelling of eyelids
- Pain & heaviness in eye lids

Table no.2-Clinical features of *Kukunaka* as per different Samhitas[4,5,6,7]

s.no	Name of Samhita	Clinical features
1	*Sushruta Samhita*	*Atimardan of Akshikut, nasa&lalata due to atikandu*, Photophobia, Excessive exudates with tears, Adhered eyelids.

2	*Kashyapa Samhita*	Excessive lacrimation, absence of sneezing, discomfort, frequent rubbing of nasal area, forehead & eyeballs, itching in the eyes, intolerance to light, swelling over eyelids.
3	*Ashtanga Hridaya*	*Vartmashoola, Pachilayta , karnanasaakshimardana.*
4	*Yogratnakar*	*Netra kandu, Netra Srava, lalataakshi kantha Nsagharshanam*
5	*RavanakritaKumartantra*	*Netra atikandu, Srava, Mastakakshikuta, Nasagharshanam, Netronmilankshaya*

SYMPTOMS AND SIGNS

Signs of Neonatal Conjunctivitis

Non-specific signs of neonatal conjunctivitis include conjunctival injection, tearing, mucopurulent or non-purulent discharge, chemosis, and eyelid swelling.

Table no.3-Signs of Specific Etiologies of Ophthalmia Neonatorum [10]

Etiologic Agent	Onset	Clinical Characteristics	Diagnosis	Treatment
Chemical	24 h	Non-infectious lid edema, watery discharge	History of exposure, self-limited in <48 h	No specific treatment as per literature
Gonococcal	3-4 days	Bilateral, hyperacute purulent conjunctivitis, marked lid edema, copious discharge	Cell culture, Gram stain for Gram-negative intracellular diplococci	Ceftriaxone 25-50 mg/kg IV/IM
Chlamydia trachomatis	5-7 days	Mild mucopurulent non-follicular conjunctivitis, lid edema, pseudomembrane formation	Cell culture, Giemsa stain, PCR	Erythromycin 12.5 mg/kg every 6 h for 2 weeks
Staphylococcus, Streptococcus, others	5-14 days	Nosocomial, mucoid discharge, conjunctival hyperemia	Cell cultures, Gram stain	Broad-spectrum topical antibiotic
Herpes simplex virus	6-14 days	Unilateral or bilateral conjunctivitis, serous discharge, vesicles on eyelids	Cell cultures, PCR	Acyclovir 60 mg/kg/day IV

Differentiating Ophthalmia Neonatorum from Other Conditions[11]

- Dacryocystitis
- Congenital glaucoma
- Nasolacrimal duct obstruction
- Preseptal /orbital cellulitis
- Keratitis

Laboratory Tests

- Gram stain
- Cultures (blood agar, chocolate agar, Thayer-Martin)
- Giemsa stain
- Polymerase chain reaction (PCR)

Risk Factors[12]

Risk factors for neonatal conjunctivitis include:

- Maternal infections
- Maternal HIV infection
- Exposure to infectious organisms
- Inadequate ocular prophylaxis
- Premature rupture of membranes (PROM)
- Ocular trauma during delivery
- Mechanical ventilation
- Prematurity

- Poor prenatal care and hygienic delivery conditions

Complications[13]

Most complications of neonatal conjunctivitis are related to gonococcal infections. Other causes are generally benign. Complications include:

- Keratitis
- Conjunctival scarring
- Superior corneal pannus
- Permanent visual impairment
- Rare systemic infections (e.g., chlamydial pneumonia, disseminated gonococcal infection)

Chikitsa of Kukunaka:

तस्य चिकित्सितं श्रेष्ठं व्याख्यास्यामि यथा तथा ।धात्रीं तु तस्य वामयेद्युक्तं चैव विपाचयेत् ॥१२॥
तस्या वान्तविरिक्ताया निर्दुह्य च स्तनावुभौ ।भोजनानि च सर्वाणि यथायुक्त प्रदापयेत् ॥१३॥
पथ्यं भुञ्जीत खादेत विपरीतं च वर्जयेत्। प्रयता शुद्धवस्त्रा स्यादक्लिष्टाऽमलिना तथा ॥१४॥[4]

का. खि. 13/12-14

Measures to be applied on Dhatri

- Emetics - should be induced to feeding Dhatri with ghee prepared with khair, triphala and neem leaves and giving pimpli, licorice honey, mustard and sandhav.
- Laxative - After this, laxative should be given with extract of hirada, pimpli and manuka.
- After that, she should be asked to eat healthy food and give up Apathya. Ask to maintain cleanliness, wear clean clothes and stay clean. It may prevent further spread to other children. She should be advised to take proper diet.
- According to Vagabhata Apply Lepaana of mother breasts and do Dhupana karma also.

Measures applicable to child:

- Eye Washing:
    - The eyes of children should be thoroughly washed with water after expressing out impurities. This process helps in relieving congestion in the eyes.
    - The expression of impure blood can be done using Jalauka (leech therapy if and only if it is fetal to eyes), Madhu (honey), and Trikatu Pratisaran (local application of a mixture of black pepper, long pepper, and ginger).

- **Application of Medicines:**
    - After cleansing the eyes, medicinal treatments such as Parisheka (sprinkling of medicated liquids), Aschotana (eye drops), and the application of Lepa (medicinal paste) and Varti (medicated sticks) are applied.

- **Eye Wash (Parisechana):**
    - Eye washes are performed using a decoction made from herbs such as Jambu (Java plum), Aamra (mango), Dhaatri (Indian gooseberry), Eranda (castor plant), Varuna, Chitra, and Tvakshiri. This herbal preparation helps soothe and cleanse the eyes.

- **Malahar Application:**
    - In cases of eye disease, a malahar made from Boracha kwath or kalk, mixed with Yashtimadhu (licorice root), is applied to the face to promote healing.

- **Diet and Meditation:**
    - Children with eye conditions should consume Kapittha (wood apple), Bilva (bael fruit), and Khadir along with goat's milk. Meditation should be practiced alongside this dietary regimen for added benefit.

- **Anjana Varti Preparation:**
    - An Anjana Varti (medicated stick for eye application) is prepared by mixing equal amounts of Manahshila (arsenic sulfide), Maricha (black pepper), Sankhnabhi (conch shell), Rasanjana (aqueous extract of Berberis aristata), Sandhavlavana (rock salt),

Guda (jaggery), and Madhu (honey).

- Additionally, milk, Madhu, and Ghrita are added to Lohabhasma (iron ash) to complete the preparation of the Varti.
- Murva, Mulethi (licorice), and Aamratawak are burned and used as Anjana (collyrium) for eye treatment.

- **Use of Medicated Ghee:**
  - Medicated ghee preparations like Triphala Ghrita or Giloy Ghrita are also used as part of the eye treatment.

- **Pratisaran (Local Application):**
  - Trikatu Churna (a powder made of black pepper, long pepper, and ginger) is used for Pratisaran, a local application to promote healing and balance in the eyes.

- **Herbal Eye Wash:**
  - In addition to medicated ghee, eye washes using decoctions made from Amalaki (Indian gooseberry), Jambu (Java plum), Aamra (mango), Eranda (castor plant), and Varuna are also used to maintain eye health.

Treatment Approaches

Modern Medical Treatment[14,15,16]

- **Empiric Antibiotic Therapy**: Includes erythromycin ophthalmic ointment, Ceftriaxone 75-100mg/kg/day IV QID, Ciprofloxacin 10-20mg/kg/day IV etc. tailored based on culture results.

Chlamydial Conjunctivitis

Initiate treatment upon positive diagnostic tests. Oral azithromycin (20 mg/kg once daily for 3 days) is recommended. Alternatively, erythromycin can be given orally (50 mg/kg/day divided into 4 doses for 14 days). Topical therapy is less effective than oral treatment.

Gonococcal Conjunctivitis

- Topical irrigation with normal saline to remove discharge
- Ceftriaxone (25-50 mg/kg IM/IV, max 125 mg) as a single dose
- If systemic disease, treatment is for 7-14 days
- Bacitracin or erythromycin ointment for additional treatment
- Hospitalization for evaluation of disseminated infection

Herpes Simplex Virus

- Acyclovir 60 mg/kg IV for 2 weeks
- Alternative regimens include trifluridine or oral acyclovir

Chemical Conjunctivitis

- No specific treatment as per literature; avoid exposure to irritants

CONCLUSION :

Kukunaka, an ancient Ayurvedic eye disorder, closely parallels Ophthalmia Neonatorum in modern medicine, affecting neonates primarily during the Ksheerapa period (breastfeeding phase). Ayurveda identifies the condition as a Kaphapradhana Tridoshajavyadhi (primarily Kapha-related disease involving all three doshas). The disorder is influenced by maternal diet, lifestyle, and improper breastfeeding, leading to symptoms like excessive lacrimation, eyelid swelling, and eye discharge. The Ayurvedic approach to treating Kukunaka focuses on diet modification for the mother, cleansing therapies (like Aschotana and Parisheka), and the use of medicinal ghee and herbal eye washes. These treatments aim to balance the doshas and improve eye health.

In contrast, Ophthalmia Neonatorum, explained in modern medicine, is primarily a bacterial or viral infection occurring in neonates, often contracted during childbirth from an infected birth canal. The condition can lead to complications like conjunctivitis and corneal damage if left untreated.Modern treatment of Ophthalmia Neonatorum includes the use of antibiotic eye drops and systemic antibiotics based on the infectious agent.

Both Ayurvedic and modern medicine stress the importance of preventive care, early diagnosis, and appropriate interventions to manage neonatal eye infections effectively. While Ayurveda provides holistic methods of treatment, modern medicine relies on specific antimicrobial therapies to prevent complications.

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