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Avaakchitiyam Adhyaya of Bhela Indriya Sthana - an explorative study

Abstract

Avaakchitiyam is the twelfth chapter of *Indriya Sthana* of *Bhela Samhita*. The word '*Avaakchitiyam'* refers to an inverted shadow (upside down) which is considered as a bad prognostic sign. *Avaakchitiyam Adhyaya* contains 17 verses dealing with various fatal conditions having poor prognosis. Previous research has established the prognostic potential of *Indriya Sthana's* of *Charaka Samhita* and *Bhela Samhita*. Still further works are required as the concepts documented in '*Avaakchitiyam Adhyaya*' of *Bhela Indriya Sthana* are poorly understood with no published literature. The present study aims to explore each and every verse of '*Avaakchitiyam Adhyaya*' in terms of their prognostic importance with the help of contemporary medical literature. Various conditions such as orbital asymmetry with exophthalmos and enophthalmos, paralytic lagophthalmos, Bell's palsy, ocular myopahties, eyebrow asymmetry associated with various neuro-ophthalmological disorders, peripheral neuropathies, neuropathic pain with mood disorders, scleroderma, saddle nose deformity, thermoregulatory disorders with autonomic neuropathies, myodesopsia, cenesthopathy, organic brain syndromes, cervical dystonia or torticollis with focal anhidrosis, septic shock, inflammatory bowel disease, visual snow syndrome, qualitative smell disorders, disease specific volatile organic compounds, specific anosmia, behavioural and psychological symptoms of dementia are documented in '*Avaakchitiyam Adhyaya*' of *Bhela Indriya Sthana*. The present study provides insights for future research and action.

Keywords: *bhela samhita*, behavioural and psychological symptoms of dementia, *charaka samhita*, *indriya sthana*, inflammatory bowel disease, visual snow syndrome

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Introduction

Maharshi Bhela has composed a treatise known as '*Bhela Samhita*' which is based on the precepts of his teacher (*Acharya Punarvasu Atreya*) and also incorporating the outcome of the discussions held in different assemblies of the sages of ancient India. *Bhela Samhita* is incomplete in many aspects and its subject matter is similar to that of *Charaka Samhita*. Probable time period of '*Bhela Samhita'* is sometime between 4th century BCE to 2nd century BCE. *Bhela Samhita* has 8 sections and 120 chapters. Similar to that of *Charaka Indriya Sthana*, *Indriya Sthana* of *Bhela Samhita* also deals with prognostic aspects and contains 12 chapters.[1,2]

Avaakchitiyam is the twelfth chapter of *Indriya Sthana* of *Bhela Samhita*. The word '*Avaakchitiyam'* refers to an inverted shadow (upside down) which is considered as a bad prognostic sign. *Avaakchitiyam Adhyaya* contains 17 verses dealing with various fatal conditions having poor prognosis.[3,4] Previous research has established the prognostic potential of *Indriya Sthana's* of *Charaka Samhita,*.[5-18] *Bhela Samhita*,[19-26] and *Kashyapa Samhita*.[27] Contents of '*Avaakchitiyam Adhyaya*' of '*Bhela Indriya Sthana'* are poorly understood and no published literature available on it till date. The present study aims to explore each and every verse of '*Avaakchitiyam Adhyaya*' in terms of their prognostic importance with the help of contemporary medical literature.

Literature search

Exploration of physical literature has been done by searching the local library for books (especially ancient *Ayurvedic* texts such as *Charaka Samhita*, *Bhela Samhita* etc) and journals. Web based search engines such as Google, Google scholar etc and various electronic databases have been searched to identify materials which were homologues to the present research topic. Various common search terms or key words (*Indriya Sthana*, *Bhela Samhita*, *Charaka Samhita*, *Bhela Indriya Sthana*, *Charaka Indriya Sthana*, prognosis, fatal conditions etc) and phrases have been used to find out 'related articles'. Except for 'language' and 'text availability', no other filters and Boolean operators were used while searching the literature. Open-access, full text articles (without keeping restrictions on article types) and abstracts published in English language were only considered in present work irrespective of their date of appearance and year of publication.

Discussion

'*Avaakchitiyam*' chapter of *Bhela Indriya Sthana* consist of 17 verses. Each verse has been explored in the following sections in terms of their meaning and prognostic importance with the help of contemporary medical literature (with special emphasis on prognosis) (Table 1).

'Avaakchita va jihma va yasya -- paretam tasya jeevitam' (Verse 1).[4]

The person (*Yashya*) whose shadow is upside down (*Avaakchita*) or crooked (*Jihma*) or minute or small (*Alpika*); and also the person who has uneven eyes (*Netre Vishame*), such a person will not survive (denotes an impending death) (*Paretam Tasya Jeevitam*).[4] In the absence of radio-diagnostic or imaging facilities, ancient Indian sages might have developed a technique to diagnose underlying or deep seated or hidden pathological conditions (which are not visible or identifiable otherwise) by observing the shadows of their patients. Shadow analysis is the novel contribution to the field of diagnosis provided by Indian sages. Shadow analysis could become a simple, non-invasive, cost-effective and reliable imaging test, if it will get authenticated by further research works. Previous research has proved that, people can be identified based on their shadows using body

biometrics. Analysis of body shadows and reflections may provide minute details and improves attention towards interoceptive signals which may facilitate in the diagnosis of deep seated pathological conditions. Abnormal shadows or reflections such as *Avaakchita* (upside down shadow), *Jihma* (crooked shadow), *Alpika* (shadows which are smaller than normal), *Adhika* (shadows which are larger than normal), *Bhinna* (broken shadows), *Tanvi* (thin shadows), *Vikruta* (malformed or abnormal shadows), *Vishira* (shadows without head) etc denote an underlying pathology and also an impending death (*Paretam Tasya Jeevitam*).[11,12]

Table 1 Verses of 'Avaakchitiyam Adhyaya' and their clinical interpretation

Verse	Relevant clinical conditions
'Avaakchita va jihma va yasya -- paretam tasya jeevitam' (B. I. 12/1)	Analysis of body shadows; Orbital asymmetry due to exophthalmos and enophthalmos;
'Yadi deenaani pakshmaani -- paretam tasya jeevitam' (B. I. 12/2)	Paralytic lagophthalmos; Ocular myopathies; Bell's palsy; Various neurological and neuro-ophthalmological disorders;
'Namantyau yasya drishyate -- shanmaasaan vyadhi varjita' (B. I. 12/3)	Eyebrow asymmetry seen in Bell's palsy; Various neurological and neuro-ophthalmological disorders;
'Lunchyamaaneshu keseshu -- paretam tasya jeevitam' (B. I. 12/4)	Hypoalgesia or analgesia seen in various peripheral neuropathies; Anhedonia; Emotional blunting; Neuropathic pain associated with mood disorders;
'Yasyaaturasya pitaka vyango -- paretam tasya jeevitam' (B. I. 12/5)	Scleroderma; Necrobiosis lipoidica (NL); Rubeosis faciei; Eczema herpeticum; Ectopic adrenocorticotropic hormone (ACTH) syndrome;
'Sushyate nasika vamsha -- paretam tasya jeevitam' (B. I. 12/6)	Saddle nose deformity; Relapsing polychondritis (RPC); Leprosy; Syphilis; Wegener granulomatosis;
'Atyushnam va ati sheetam va -- paretam tasya jeevitam' (B. I. 12/7)	**Atyushna Paani Paada:** Erythroderma; Erythromelalgia (EM); Thyrotoxicosis; Hyperthermia caused by anhidrosis due to neuropathies; **Ati Sheeta Paani Paada:** Cold hypersensitivity in the hands and feet (CHHF); Hypothyroidism; Raynaud's phenomenon (RP); Autonomic disorders associated with hypothermia; **Ati Mrudu Paani Paada:** Thyrotoxicosis; Palmo-plantar hyperhidrosis; Muscle atrophy in various neuromuscular conditions; **Ati Stabdha Paani Paada:** Tetany; Dystonia; Dupuytren's disease (DD); Distal myopathies; Neuromuscular or neurological conditions;
'Yo avateerna nadeem purnaam -- yasya naasteeti tam vidu' (B. I. 12/8)	Myodesopsia; Tactile hallucinations (THs); Cenesthopathy; Organic brain syndromes; Neuropsychiatric conditions;
'Vivartayati ya seershamatyardham -- naasti tasya chikitsitam' (B. I. 12/9)	Cervical dystonia or torticollis with focal anhidrosis seen in various neurological, neuromuscular and musculoskeletal conditions;
'Jwaryate kaasate vaapi -- yatha preta stathaiva sa' (B. I. 12/10)	Upper/lower respiratory tract infections (URTI & LRTIs) causing septicaemia, systemic inflammatory response syndrome (SIRS), multiple organ dysfunction syndrome (MODS), septic shock;
'Yasyodaram samaadhmaatam -- yatha preta stathaiva sa' (B. I. 12/11)	Inflammatory bowel disease (IBD) and its complications;
'Anaaratam gruhe yasya -- yasya syaat tam vivarjayet' (B. I. 12/12)	Visual snow syndrome (VSS);
'Apradhatu pradhaturva -- na sa jeevati taadrusha' (B. I. 12/13)	Qualitative smell disorders such as parosmia or phantosmia or dysosmia; Disease specific VOCs (volatile organic compounds);
'Yuthikotpanna gandashcha -- yo vaati na sa jeevati' (B. I. 12/14)	Generalized or specific anosmia associated with fatal underlying conditions;
'Dvishadbhi kurute sakhyam ya -- paretam tasya jeevitam' (B. I. 12/15)	Behavioural and psychological symptoms in dementia (BPSD) seen in neurodegenerative disorders or dementias;
'Ebhirevamvidhairlingai -- bhishaganvitamaaturam' (B. I. 12/16)	Prognostic decision making by an expert physician;
'Etatbhishagarishthaanaam -- sa bhishak shaastra kovida' (B. I. 12/17)	Skilful physician in prognostication;

(B. I. 12/XX): B - Bhela Samhita; I - Indriya Sthana; 12 - Twelfth chapter; XX - Verse number

Netre Vishame denotes orbital asymmetry due to conditions like exophthalmos (protruding eye) and enophthalmos (sunken eye). *Netragata Arishta Lakshanas* (fatal ophthalmological signs) are explained in the third chapter (*Parimarshaneeyam Indriyam*) of *Indriya Sthana* of '*Charaka Samhita*'. *Atyutpindita* (bilateral exophthalmos), *Ati Pravishtha* (bilateral enophthalmos) and *Ati Vishama* (orbital asymmetry due to unilateral exophthalmos or enophthalmos) are considered as *Netragata Arishta Lakshanas*.[7] Proptosis (exophthalmos or protruding eyes) occurs due to a wide variety of conditions such as infectious (orbital cellulitis, mucormycosis, mucocele), inflammatory (thyroid eye diseases, Granulomatosis with polyangiitis, sarcoidosis, idiopathic orbital inflammation),

vascular (orbital hematoma or retrobulbar haemorrhage, carotid-cavernous fistulas, orbital lymphatic malformations, capillary and cavernous hemangiomas), and neoplastic entities (orbital lymphoma, orbital rhabdomyosarcoma, optic nerve glioma, optic nerve sheath meningioma, metastatic tumours to the orbit) that can be life threatening (*Paretam Tasya Jeevitam*). Unilateral proptosis can be seen in orbital cellulitis, developmental anomalies, inflammatory conditions, vascular anomalies, neoplasms and metabolic diseases.[28] Structural alterations in the bony orbit (chronic maxillary sinusitis, silent sinus syndrome, Paget's disease, neurofibromatosis), orbital fat atrophy (senile anophthalmos, scleroderma, Parry-Romberg syndrome, orbital varices, lipodystrophy) and retraction (metastases, Duane retraction syndrome, Wegener's granulomatosis) are the three main pathological mechanisms involved in the manifestation of enophthalmos (sunken eyes). Enophthalmos (unilateral or bilateral) may be associated with potentially life-threatening systemic illness (*Paretam Tasya Jeevitam*).[29]

'Yadi deenaani pakshmaani -- paretam tasya jeevitam' (Verse 2).[4]

A person who is unable to close (*Na Nimeelanti*) his/her eyelids (*Pakshmaani*) completely and having burning eyes (*Dahyate Nayane*), such a person will not survive (denotes an impending death) (*Paretam Tasya Jeevitam*).[4] The condition described in the present verse (*verse* 2) denotes 'Lagophthalmos' which is defined as incomplete or defective closure of the eyelids (*Na Nimeelanti*). Due to the inability to blink and close the eyes (*Na Nimeelanti*) leads to corneal exposure and excessive evaporation of the tear film (*Dahyate Nayane*). The main cause of paralytic lagophthalmos (*Deenaani Pakshmaani*) is facial nerve paralysis.[30] Infections, trauma, tumours, metabolic, neurological, idiopathic, toxic and iatrogenic factors are the causative factors for paralytic lagophthalmos (*Deenaani Pakshmaani Na Nimeelanti*). An incomplete blink and lagophthalmos (*Na Nimeelanti*) is seen in patients with Parkinson disease and ocular myopathies (myotonic dystrophy and chronic progressive external ophthalmoplegia) (*Deenaani Pakshmaani*). Facial nerve paralysis is caused by lower motor neuron lesions (Bell's palsy and Ramsay Hunt syndrome) and upper motor neuron lesions (cerebral ischaemic event, multiple sclerosis, intracranial hemorrhage and tumours) (*Paretam Tasya Jeevitam*). History of head, neck and cutaneous malignancy are considered as risk factors (*Paretam Tasya Jeevitam*) in cases of lagophthalmos (*Na Nimeelanti Pakshmaani*). Dry eyes (*Dahyate Nayane*), corneal abrasions (*Dahyate Nayane*), corenal ulceration (*Dahyate Nayane*), keratitis (*Dahyate Nayane*), corneal scarring, corneal perforation and visual loss are the complications (*Paretam Tasya Jeevitam*) of lagophthalmos..[31] The present verse denotes various fatal conditions associated with paralytic lagophthalmos.

'Namantyau yasya drishyate -- shanmaasaan vyadhi varjita' (Verse 3).[4]

A person whose eye brows (*Bhruvau*) are displaced i.e. either drooped or depressed (*Namantyau*) or elevated or raised (*Murdhani Sthite*), such a patient (*Rogi*) will survive for three days (*Jeevet Tryaham*) or s/he will be freed from disease (*Vyadhi Varjita*) within six months (*Shanmaasaan*).[4] The present verse denotes 'Brow asymmetry'. Hyperkinesis of unilateral frontalis muscle cause asymmetric brow elevation (*Bhruvau Murdhani Sthite Va Drushyate*) and hyperactive depressor supercilii muscle or orbicularis oculi muscle may lead to brow depression (*Bhruvau Namantyau Va Drushyate*). Injury to the temporal branch of the facial nerve may also cause brow asymmetry. Involvement of the facial nerve trunk will affect all the distal ipsilateral branches and the asymmetric brow may be just a part of unilateral facial paralysis. Asymmetric brow may be the result of emergency conditions, such as stroke or malignancy (*Jeevet Tryaham Rogi*).[32] Trauma and history of facial palsy can cause eyebrow asymmetry. Ptosis of upper eyelid can also be the cause of eyebrow asymmetry. Patients elevate the eyebrow (*Bhruvau Murdhani Sthite Va Drushyate*) on the affected side to compensate ptosis (*Bhruvau Namantyau Va Drushyate*), which may results in eyebrow asymmetry. Skeletal asymmetry of the orbital region can also cause eyebrow asymmetry.[33] Eyebrow elevation (*Bhruvau Murdhani Sthite Va Drushyate*) is a natural compensatory response to blepharoptosis. The frontalis muscle elevates the forehead and eyebrows.[34] Acquired brow ptosis (*Bhruvau Namantyau Va Drushyate*) can occur due to various causes such as senile, traumatic (intra cranial, intra temporal and extra temporal facial nerve damage), myogenic (myasthenia gravis, myotonic dystrophy, and oculopharyngeal muscular dystrophy), infectious (Ramsay Hunt syndrome, herpes, lyme disease, tertiary syphilis, HIV, polio and West Nile virus), spasm induced (blepharospasm and facial dystonia) and neoplastic (basal or squamous cell carcinoma and acoustic neuroma) (*Jeevet Tryaham Rogi*).[35] Bell's palsy is facial nerve paralysis (with eyebrow asymmetry?) and it may take 6 to 9 months for complete recovery (*Shanmaasaan Vyadhi Varjita*).[36] '*Shanmaasaan Vyadhi Varjita*' in present verse denotes eyebrow asymmetry caused by self-limiting diseases whereas '*Jeevet Tryaham Rogi*' denotes eyebrow asymmetry caused by some underlying emergency conditions.

'Lunchyamaaneshu keseshu -- paretam tasya jeevitam' (Verse 4).[4]

If a person is unable to feel the pain (*Na Vedayan*) caused by plucking his scalp hair (*Lunchyamaaneshu Keseshu*) and also insensitive to pain and pleasure (*Nivrutta Sukha Dukha*), such a person (*Tasya*) will not survive long or will die soon (*Paretam Jeevitam*).[4] Similar verse has been documented in the eighth chapter (*Avaakshiraseeyam Indriyam*) of '*Charaka Indriya Sthana*'. Diminished or loss of pain sensation is called as hypoalgesia or analgesia (due to pathological conditions of spino-thalamic tracts). Sensory loss over the scalp can be seen in conditions like acute sensory polyneuritis, Guillain-Barre syndrome (GBS), compression of greater occipital nerve (causes unilateral scalp numbness), peripheral neuropathies (diabetic symmetric distal polyneuropathy - DSDP and cryptogenic sensory polyneuropathy - CSPN), syringomyelia (involving the cervical spine), pure neuritic form leprosy (PNL), silent neuropathy (SN), leprosy neuropathy (mononeuropathy, multiple mononeuropahty, distal neuropathy and polyneuropathy) etc.[12] Peripheral neuropathies cause muscle weakness and sensory loss (*Na Vedayan*), positive sensory symptoms and sometimes pain (extremely intense and most disabling) (*Ati Vedanaam*).[37]

'*Nivrutta Sukha Dukha*' denotes emotional blunting or anhedonia (inability to enjoy pleasurable activities) or mood disorders or acute stress due to a fatal disease or various neuropsychiatric conditions. Symptoms of depression in cancer patients (*Paretam Tasya Jeevitam*) may include persistent feelings of sadness, numbness (*Na Vedayan*?), worthlessness, helplessness or hopelessness and lacking interest or pleasure in activities (*Nivrutta Sukha Dukha*?).[38] Neuropathic pain is characterized by both sensory (*Na Vedayan* & *Ati Vedanaam*) and mood disturbances (*Nivrutta Sukha Dukha*), supporting the belief that pain (*Ati Vedanam*) and mood disorders (*Nivrutta Sukha Dukha*) share common pathogenic mechanisms. Neuropathic pain is characterized by sensory symptoms such as gain (*Ati Vedanaam*) or loss of somatosensory function (*Na Vedayan*) and burning & evoked pain (*Ati Vedanaam*). The affective disturbances (*Nivrutta Sukha Dukha*) associated with pain (*Ati Vedanaam*) include depression, anhedonia (*Nivrutta Sukha*) and other features.[39]

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'Yasyaaturasya pitaka vyango -- paretam tasya jeevitam' (Verse 5).[4]

Manifestation of (*Drushyate*) hyperpigmentation (*Vyanga*) or skin lesions (*Pidaka*) on face (*Mukhe*) without any known cause (*Adrushtapurvam*) for the first time (*Pradhamam*) denotes an imminent death (*Paretam Tasya Jeevitam*)..[4] Skin becomes deadly pale or turns white or attains earth-like colour (*Vyanga*?) during end-of-life stages (*Paretam Tasya Jeevitam*) in senile dementia patients.[40] Scleroderma is characterized by indurated and thickened skin (*Pidaka*?) involving various body parts including face (*Mukhe*). Scleroderma diabeticorum is unresolving and progressive in nature (*Paretam Tasya Jeevitam*?). Necrobiosis lipoidica (NL) is a chronic granulomatous skin disease commonly seen in diabetic patients. NL begins as a single or group of erythematous papules that later expand and aggregate into plaques (*Pidaka*) with atrophic center containing telangiectasias. NL lesions can occur on face also (*Mukhe*). The pathogenesis of NL is not well understood (*Adrushtapurvam*) and it is a chronic, disfiguring, debilitating condition and difficult for clinicians to manage (*Paretam Tasya Jeevitam*). Rubeosis faciei is characterized by chronic erythema of the face with flushed appearance (*Vyanga*) that is more prominent in lighter coloured skin people. Rubeosis faciei is associated with complications of diabetes mellitus, such as neuropathy, retinopathy, and nephropathy (*Paretam Tasya Jeevitam*).[41] The dermal induration in systemic sclerosis is commonly associated with hypo or hyperpigmentation (*Vyanga*) and telangiectasias of the skin, and can be observed on face (*Mukhe*) giving typical facial features called 'mask-like face' (*Mukhe Vyanga*). The exact pathology of systemic sclerosis is unknown (*Adrushta Purvam*). Patients with diffuse systemic sclerosis have poor prognosis associated with wide range of systemic complications (*Paretam Tasya Jeevitam*).[42] Eczema herpeticum can become severe, progressing to disseminated infection and death if not treated (*Paretam Tasya Jeevitam*). Patients often present with herpetic vesicles (*Pidaka*) most often on the face (*Mukhe*).[43] Ectopic adrenocorticotropic hormone (ACTH) syndrome is characterized by skin hyperpigmentation (*Vyanga*) along with other features. This syndrome is frequently associated with small-cell lung cancer or oat cell carcinoma, colon, pancreas, gallbladder, thyroid, breast cancers and carcinoid tumours, pheochromocytoma and haematological malignancies (*Paretam Tasya Jeevitam*). Facial hyperpigmentation (*Mukhe Vyanga*) can be seen in ACTH ectopic syndrome due to periampullary cancer (*Paretam Tasya Jeevitam*?).[44]

'Sushyate nasika vamsha -- paretam tasya jeevitam' (Verse 6).[4]

The patient who has been suffering with atrophy (*Sushyate*) of the nasal septum (*Nasika Vamsha*) associated with swollen shoulders (*Amso Prudhutvam*) and cough (*Kasa*) will not survive for long (or will die soon) (*Paretam Tasya Jeevitam*).[4] Similar verse has been documented in the eighth chapter (*Avaakshiraseeyam Indriyam*) of '*Charaka Indriya Sthana*'; according which, '*Glaayate Nasika Vamsha*' denotes 'saddle nose deformity' (due to various infections such as leproys, syphilis, Wegener granulomatosis, relapsing polychondritis - RPC etc) whereas '*Prudhutvam Nasika Vamsha*' denotes rhinophyma associated with systemic malignancies or skin cancers. Saddle nose deformity is characterized by the deviation of the nasal septum, nasal obstruction and collapse of cartilaginous dorsum of the nose (*Sushyate Prudhutvam Nasika Vamsha*)..[12] RPC is an episodic, progressive inflammatory disorder characterized by immune-mediated damage of cartilaginous structures such as the ears, nose (*Sushyate Nasika Vamsha*), joints (*Amso Prudhutvam*) and respiratory tract (*Kasa*). Nasal chondritis (*Sushyate Nasika Vamsha*), costochondritis & oligo/polyarthritis with tenosynovitis (*Amso Prudhutvam*?) and chronic laryngotracheal & bronchial chondritis (*Kasa*) can be seen in RPC.[45] Saddle type appearance of nose (*Sushyate Nasika Vamsha*), swelling of shoulders (*Amso Prudhutvam*), and cough (*Kasa*) can be seen in chronic atrophic perichondritis.[46] The present verse denotes various conditions such as leprosy, syphilis, Wegener granulomatosis, RPC etc associated with life threatening complications.

'Atyushnam va ati sheetam va -- paretam tasya jeevitam' (Verse 7).[4]

The person, who feels (*Manyate*) his/her palms and soles (*Paani Paadam*) excessively hot (*Atyushna*) or cold (*Ati Sheeta*) or excessively soft (*Ati Mrudu*) or stiff (*Ati Stabdha*), such a person will not survive or will die soon (*Paretam Tasya Jeevitam*)..[4] The present verse denotes various vascular, neurological, musculoskeletal and autoimmune conditions.

Atyushna paani paadam

Warm hands (*Atyushna Paani*) indicate the body is acting to lose heat.[47] The skin is bright red, dry, scaly and warm to touch (*Atyushna*) in Erythroderma patients. Involvement of palms and soles (*Paani Paadam*) with hair loss and nail shedding can be seen in erythroderma patients. Erythroderma can be fatal (*Paretam Tasya Jeevitam*) and may be a cutaneous manifestation of malignancy.[48] Thyrotoxic skin is characterized by warmness (*Atyushna*) (due to increased cutaneous blood flow), moistness (reflection of the underlying metabolic state) and smoothness (*Ati Mrudu*).[49] Soles (*Paadam*) and palms (*Paani*) could be affected primarily in Erythromelalgia (EM). The skin in EM becomes erythematous and warm (*Atyushna*), referred by the patient as a burning pain (*Atyushnam Manyate*).[50] *Atyushna Paani Paadam* also represents hyperthermia caused by various underlying conditions such as widespread anhidrosis due to cholinergic failure, Sicca syndrome, idiopathic generalized anhidrosis, Ross syndrome, chronic idiopathic anhidrosis, generalized autonomic failure, diabetic autonomic neuropathy, multiple system atrophy (MSA), spinal cord injury, status epilepticus, Fabry's disease, pheochromocytoma, cholinergic neuropathy, autoimmune autonomic ganglionopathy, generalized small fiber neuropathy, and hot environment.[51]

Ati sheeta paani paadam

Cold hands (*Ati Sheeta Paani*) indicate that the body is acting to retain heat.[47] Decreased local temperature (*Ati Sheeta*) also suggests ischemia or reduced blood flow to that part.[7] Raynaud's phenomenon (RP) is an exaggeration of the normal physiological response to cold exposure (*Ati Sheeta Paani*) classically described with a triphasic colour change of the digits (*Paani*). Raynaud's is the common presenting symptom for various connective tissue diseases like scleroderma, lupus and mixed connective tissue disease.[52] Cold hypersensitivity in the hands and feet (CHHF) (*Ati Sheeta Paani Paadam Manyate*) patients complain of coldness in the hands and feet in an environment that is not considered cold.[53] *Ati Sheeta Paani Paadam* also represents hypothermia caused by various underlying conditions such as malnutrition, exposure to extreme cold, hypoglycaemia, diabetic ketoacidosis, hypothyroidism, adrenal failure, hypopituitarism, renal failure, shock, sepsis, anorexia nervosa, dementia, schizophrenia, hepatic encephalopathy, head trauma, spinal cord injury, stroke, Parkinson's disease (PD), MSA, myopathy, peripheral neuropathy, Wernicke encephalopathy, amyotrophic lateral sclerosis (ALS), and multiple sclerosis (MS). Autonomic disorders causes thermoregulatory failure and leads to hypothermia (*Ati Sheeta*) or hyperthermia (*Atyushna*), both of which carry substantial risk of morbidity and mortality (*Paretam Tasya Jeevitam*).[51]

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Ati mrudu paani paadam

Excessive softness of palms and soles (*Ati Mrudu Paani Paadam*) may represent palmoplantar hyperhidrosis caused by thyrotoxicosis, Hodgkin's disease, chronic alcoholism, DM, tuberculosis and malignancies (*Paretam Tasya Jeevitam*).[54] *Ati Mrudu Paani Paadam* may also denotes conditions associated with muscle wasting or atrophy seen in motor neuron disease (MND), ALS, muscular dystrophies, distal myopathies, and neuromuscular diseases. *Ati Mrudu Paani Paadam* also represents oedema (due to inflammatory or non-inflammatory pathologies) of palms and soles. Excessively moist and smooth skin (*Ati Mrudu*) can also be seen in thyrotoxicosis.[49]

Ati stabdha paani paadam

Tetany is characterised by episodic paraesthesia of the hands, feet (*Paani Paadam*) and lips, associated with stiffness or cramps (*Ati Stabdha*). Hypocalcaemia and alkalosis are the important causes for tetany.[55] Muscle rigidity or spasticity of hands (*Ati Stabdha Paani*) can also be seen in conditions such as dystonias, MND, ALS, MS, spinal muscular atrophy (SMA), progressive muscular atrophy (PMA), carpal tunnel syndrome (CTS), cervical rib etc.[56] Nephrogenic fibrosing dermopathy (NFD) or Nephrogenic systemic fibrosis (NSF) is a progressive form of fibrosis that develops in many systems and causes severe contractures (*Ati Stabdha*) of joints in patients with end stage renal disease (ESRD) (*Paretam Tasya Jeevitam*). Tender hands with stiffness and feet (*Ati Stabdha Paani Paadam*) with restriction of movement along with thick hard skin can be found in NSF patients.[57] Dupuytren's disease (DD) is characterized by fibromatosis (*Ati Stabdha*) in areas such as the palms (*Paani*), fingers, knuckle pads, and sole of the foot (*Paadam*). DD can be defined as shortening, thickening, and fibrosis (*Ati Stabdha*) of the palmar fascia (*Paani*) producing a flexion deformity of a finger (*Ati Stabdha*).[58] *Ati Stabdha Paani Paadam* also represents various underlying neurological, musculoskeletal, neuromuscular, inflammatory or autoimmune systemic illnesses.

'Yo avateerna nadeem purnaam -- yasya naasteeti tam vidu' (Verse 8).[4]

The person (*Yo*) who have descended (*Avateerna*) in to the river (*Nadeem*) full of water (*Purnaam*) and perceives (*Pashyati*) net like objects (*Jaalakam*) in clear water; always feels that his/her body (*Gaatram*) is anointed with water (*Liptamaadbhishcha*), such a person will die soon (*Yasya Nasteeti Tam Vidu*)..[4] Similar verse has been documented in the fourth chapter (*Indriyaneekam Indriyam*) of '*Charaka Indriya Sthana*'; according to which, '*Jaalam Ajaalavate*' (perceiving cobweb like structures in their absence) denotes 'eye floaters' which are clearly visible on plain backgrounds such as '*Jale Suvimale*' (clean and clear water). Eye floaters are the common complaints by the patients in ophthalmological clinics that are described as spots, threads, hair like, hollow circles, cobwebs (*Jaalakam*), and flashes. Eye floaters occur due to liquefaction in the vitreous body which ultimately leads to posterior vitreous detachment (PVD). The word '*Toye Pashyati Jaalakam'* denotes cobweb like eye floaters that are visible clearly on plain backgrounds. Myodesopsia is seen in various conditions such as optic neuritis, chronic myeloid leukemia (*Yasya Naasteeti Tam Vidu*?), vitreous syneresis, retinal detachments, vitritis, and macular edema.[8]

'*Gaatram Liptamaadbhishcha*' (feeling like one's body is wet or anointed with water) denotes tactile hallucinations (THs) or somatic delusions seen in various neurological, psychiatric and organic brain syndromes. In elementary forms of THs, the patient feels diffuse or limited, discontinuous or continuous, skin impressions such as hot, cold, humidity (*Gaatram Liptamaadbhishcha*), pressure, itching, bites, burns, etc. THs and somatic delusions can be seen in patients with cerebrovascular accidents (CVA). Somatic delusions can be found in lenticular, thalamic and medullar lesions in the right posterior temporo-parieto-occipital cortex whereas THs and bizarre delusions are seen in left temporo-parieto-occipital ischemic stroke. THs and complex visual hallucinations are seen in right temporo-parieto-occipital ischemic stroke.[59] Patients describe their THs like, 'feeling that something such as oil is put in contact with or touched the body' or 'a thin layer of oil was put on my body' (similar to *Gaatram Liptamaadbhishcha*?).[60] Feeling like 'stuffiness' (a type of tactile hallucinations) (*Gaatram Liptamaadbhishcha*) comes under the category of 'coenesthopathy'. Chloral tactile hallucinations produce feelings of 'humidity' over the skin (*Gaatram Liptamaadbhishcha*). THs are associated with organic states such as brain injury, dementia, hypophyseal tumours, diabetes and malignancies (i.e., carcinoma of cervix, breast, colon, lung etc) (*Yasya Naasteeti Tam Vidu*?).[61] Abnormal bodily sensations (cenesthesias) can be seen in 'Cenesthopathic schizophrenia'. 'Cenesthopathy' is defined as 'pathological body sensations', such as the feeling that a hand has turned to jelly'. Feeling like 'falling or sinking' (*Gaatram Liptamaadbhishcha*) is one of the most commonly reported cenesthetic sensations. Cenesthesias can be seen in schizoid and schizotypal personality disorder, delusional disorder, neuroses, Munchausen's syndrome, melancholic depression, organic brain diseases (*Yasya Naasteeti Tam Vidu*?) such as tumours, vascular, traumatic and inflammatory diseases, MS, complex partial seizures and hypochondriasis.[62]

'Vivartayati ya seershamatyardham -- naasti tasya chikitsitam' (Verse 9).[4]

Excessive and persistent turning (*Vivartayati*) of the head (*Seersham*) to one side or head tremors (*Vivartayati*?) associated with excessive sweating (*Atyardham*) on nose (*Naasa*) and loss of sweating (*Na Swidyate*) on forehead (*Lalaatam*) denotes an imminent death (*Naasti Tasya Chikitsitam*).[4] Similar verse has been documented in the eighth chapter (*Avaakshiraseeyam Indriyam*) of '*Charaka Indriya Sthana*'; according to which, '*Shiro Vikshipate Krichhraan*' denotes head titubation or tremors or rhythmic shaking or neck rigidity or neck stiffness and '*Lalaata Sruprata Sweda*' denotes focal hyperhidrosis on forehead. Both neck rigidity with stiffness and focal hyperhidrosis can be seen in can be seen in various conditions such as versive and atonic seizures, occipital lobe epilepsy (OLE), spinal cord injury (SCI) at the level of cervical spine, intramedullary spinal cord tumours, and syringomyelia.[17] In present verse, '*Vivartayati Seersham*' denotes involuntary muscle contractions in the neck that cause abnormal postures and movements of the neck and head whereas '*Atyardham Swidyate Naasa*' denotes focal hyperhidrosis on nose and '*Na Swidyate Lalaatam*' represents anhidrosis over forehead.

Lalaatam na swidayte & atyardham swidyate naasa

Central or neuropathic anhidrosis (*Na Swidyate Lalaatam*?) can be seen in various conditions such as tumours or infarctions of the hypothalamus, pons, or medulla, spinal cord tumours, SCI, or infarctions, degenerative syndromes (Ross syndrome or Shy-Drager syndrome), Horner syndrome, autoimmune autonomic and peripheral neuropathy (diabetes, alcohol use disorder, leprosy, amyloidosis).[63] Unilateral anhidrosis can be found in the patients of Horner syndrome (they perspire on one side of the forehead but not on the other) (*Lalaatam Na Swidyate*).[64] Anhidrosis (*Na Swidyate*) in Ross syndrome develops slowly and it is progressive in nature. Wide spread anhidrosis (*Na Swidyate*) is associated with compensatory hyperhidrosis (*Atyardham Swidyate*) in remaining areas.[65] A cortical

lesion cause contralateral anhidrosis (*Na Swidyate*), a lesion in the medulla could result in contralateral or ipsilateral anhidrosis (*Na Swidyate*), and any lesion distal to the medulla will cause ipsilateral anhidrosis (*Na Swidyate*).[66] Developing segmental or localized hyperhidrosis (*Atyardham Swidyate*) is rare and it can present on the forehead (*Lalaatam*), axilla, palm, or feet. Unilateral hyperhidrosis (*Atyardham Swidyate*) tends to be more common on the right side of the face, with anhidrosis (*Na Swidyate*) on the left side..[67] Hence both hyperhidrosis (*Atyardham Swidyate Naasa*) and anhidrosis (*Na Swidyate Lalaatam*) can occur together in a same patient based on the above findings.

Vivartayati seersham

Cervical dystonia or torticollis affects the neck muscles, causing the head to turn and twist or be pulled forward or backward (*Vivartayati Seersham Atyardham*). This can be seen in Parkinsonian syndromes such as idiopathic parkinsonism, secondary parkinsonism (vascular, post-traumatic, post-encephalitis), PD plus or Parkinson's plus syndromes (MSA, dementia with Lewy bodies - DLB, PSP, corticobasal syndrome), heredodegenerative parkinsonism (spinocerebellar ataxia, Wilson's disease, Huntington's disease, ataxia syndrome) etc. Dropped head syndrome, craniocervical dystonia (*Vivartayati Seersham Atyardham*) or oromandibular dystonia or anterocollis (*Vivartayati Seersham Atyardham*) associated with hypo or anhidrosis (*Na Swidyate Lalaatam*?) can be seen in MSA.[68] Orofacial dystonia, disproportionate anterocollis (*Vivartayati Seersham Atyardham*), myoclonus and dystonia involving cervical regions which manifests as anterocollis (*Vivartayati Seersham Atyardham*) are seen in MSA. Autonomic symptoms of MSA may include anhidrosis (*Na Swidyate Lalaatam*?).[69] The present verse denotes various neurological, neuromuscular and musculoskeletal conditions that are associated with poor prognosis.

'Jwaryate kaasate vaapi -- yatha preta stathaiva sa' (Verse 10).[4]

Person suffering with fever (*Jwaryate*), cough (*Kaasate*), gasping for breath (*Aakramyate*), dyspnoea (*Uchvasati Drudham*) and fainting (*Taamyate*) will not survive for long (*Yatha Preta Stathaiva*).[4] The present verse denotes upper or lower respiratory tract infections (URTI & LRTIs) causing septicaemia, systemic inflammatory response syndrome (SIRS), multiple organ dysfunction syndrome (MODS), septic shock and ultimately death. Fever (*Jwaryate*), cough (*Kaasate*), tachypnea (*Uchvasati Drudham*), inspiratory rales (*Uchvasati Drudham*), bronchial breathing (*Uchvasati Drudham*) and pleuritic pain can be seen in pneumonia.[70] In pneumonia, the diffusion of oxygen is limited and leads to shortness of breath (*Uchvasati Drudham*).[71] Central airway obstruction can be caused by malignancies such as lung cancer (*Yatha Preta Stathaiva*) extending into the airway lumen and it manifests with symptoms of respiratory distress (*Aakramyate* or *Uchvasati Drudham*), stridor (*Uchvasati Drudham*), dyspnoea (*Uchvasati Drudham*), haemoptysis, cough (*Kaasate*) and fever (*Jwaryate*) due to post-obstructive pneumonitis.[72] COVID-19 infection is associated with signs and symptoms such as fever (*Jwaryate*), cough (*Kaasate*), nasal congestion, sore throat, shortness of breath (*Aakramyate* or *Uchvasati Drudham*), myalgias, headaches, and presyncope or syncope (*Taamyate*).[73] Pulmonary embolism (PE) is characterized by dyspnoea (*Uchvasati Drudham*), cough (*Kaasate*), tachypnea (*Uchvasati Drudham*), hypoxia (*Aakramyate*), hydrothorax, edema in lower extremities, fever (*Jwaryate*), syncope (*Taamyate*), hemoptysis and pleuritic pain.[74] LRTIs ranked second among the leading causes of sepsis. Six types of organ dysfunction are seen in sepsis, neurological (altered mental status) (*Taamyate*), pulmonary (with hypoxaemia) (*Aakramyate* or *Uchvasati Drudham*), cardiovascular (shock) (*Taamyate*), renal, haematological and hepatic. Patients with sepsis typically present with altered mental status manifested by lethargy, confusion (*Taamyate*) or delirium (*Yatha Preta Stathaiva*). Sepsis is characterized by features like tachypnoea (a hallmark of sepsis-induced adult respiratory distress syndrome) (*Uchvasati Drudham*), hypoxaemia, hypercarbia, respiratory muscle fatigue, respiratory failure (*Aakramyate* or *Uchvasati Drudham*), decreased lung compliance, impaired oxygen uptake and carbon dioxide elimination, left ventricular heart failure and multiple organ failure (which causes death) (*Yatha Preta Stathaiva*).[75]

'Yasyodaram samaadhmaatam -- yatha preta stathaiva sa' (Verse 11).[4]

Patient suffering with abdominal distension (*Udara Samaadhmaatam*), eyelid swelling (*Vartma Samaadhmaatam*), diarrhoea (*Bhinnam Purisham*) and thirst (*Trishna*) will not survive for long or will die soon (*Yatha Preta Stathaiva*).[4] The present verse denotes a condition of inflammatory bowel disease (IBD) with ocular manifestations. Diarrhoea (*Bhinnam Purisham*), abdominal distension (*Udara Samaadhmaatam*) and features of dehydration (*Trishna*) can be seen in the patients with IBD. Patients with IBD tend to have much higher mortality (*Yatha Preta Stathaiva*).[76] Though IBD has a specific predilection for the intestinal tract, it is a systemic inflammatory disorder affecting multiple organs, including the eye (*Vartma Samaadhmaatam*?). IBD includes both ulcerative colitis (UC) and Crohn's disease (CD). Ocular complications (*Vartma Samaadhmaatam*) in IBD patients include conjunctivitis, episcleritis, scleritis, anterior uveitis, marginal keratitis, retinitis, optic neuritis, retinal vascular occlusive disease, and orbital inflammatory syndrome (inflammation of the glands, muscles, and connective tissue that surround the eye) (*Vartma Samaadhmaatam*).[77] The incidence of colorectal cancer (CRC) (*Yatha Preta Stathaiva*) is increased in UC patients whereas cancers in the small & large intestines (especially in the rectum and anal canal) are high in CD patients (*Yatha Preta Stathaiva*).[78]

'Anaaratam gruhe yasya -- yasya syaat tam vivarjayet' (Verse 12).[4]

A person, who hears continuous (*Anaaratam*) loud sounds similar to that of ringing of brass bells (*Kaansyam Bhidyeta*), perceives moon light (*Chandra*) as very bright (*Teekshno*) and bright sunlight (*Arka*) as dull or hazy (*Mrudushcha*), such a person should be left alone or should not be treated (denotes an imminent death) (*Tam Vivarjayet*).[4] *Kaansyam Bhidyeta* denotes tinnitus (a ringing or buzzing noise in the ears) whereas '*Chandra Teekshno*' and '*Mrudushchaarko'* denotes visual perceptual distortions (VPDs) or visual illusions. The present verse denotes a condition of Visual snow syndrome (VSS). VSS is characterized by a constant (*Anaaratam*) positive visual disturbance (*Chandra Teekshno*) over the entire visual field. Visual symptoms such as palinopsia, entoptic phenomena, photophobia, and nyctalopia are seen in VSS. VSS likely represent a clinical continuum (*Anaaratam*), with varying severity. Severe VSS (*Tam Vivarjayet*) commonly associated with comorbid conditions such as migraine and tinnitus (*Kaansyam Bhidyeta*).[79] Cortical hyperexcitability and thalamo-cortical dysrhythmia are potential mechanisms for the manifestation of symptoms in VSS. Phonophobia and daily tinnitus (*Anaaratam Kaansyam Bhidyeta*) are the non-visual symptoms of VSS.[80] Comorbid migraine aggravates the VSS by worsening some of the additional visual symptoms (*Chandra Teekshno* & *Mrudushchaarko*)

and tinnitus (*Kaansyam Bhidyeta*). Spontaneous photopsia (bright flashes of light) (*Chandra Teekshno*?), photophobia, and nyctalopia (impaired night vision) (*Chandra Teekshno*?) are seen in VSS.[81] VSS patients describe their visual disturbances as constant flashing lights (*Chandra Teekshno*?) or small flashing dots and a granular or hazy image (*Mrudushchaarko*?) with a static like background or missing areas (*Mrudushchaarko*?) in visual field or flickering (*Chandra Teekshno*?) throughout the visual field or worsening of visual disturbances in dim light (*Chandra Teekshno*?).[82] Visual disturbances along with tinnitus explained in the present verse represent VSS.

'Apradhatu pradhaturva swastho -- na sa jeevati taadrusha' (Verse 13).[4]

A healthy person (*Swastha*) or a patient (*Aatura*), who perceives the smell like sandal wood (*Chandanamivaavaati*) even in the absence of wood (*Apradhatu*) or metal (*Pradhatu*) or any other such perfumery substance nearer to him/her, such a person will not survive for long (*Na Sa Jeevati Taadrusha*)..[4] Description of the present verse according to another text is, 'a healthy person (*Swastha*) or a patient (*Aatura*) either physically well built (*Pradhatu*) or emaciated/ malnourished (*Apradhatu*) and emits the smell like sandal wood (*Chandanamivaavaati*) in the absence perfumery substance nearer to him/her, such a person will not survive for long (*Na Sa Jeevati Taadrusha*)'.[3] Both of these versions have one major difference, perceiving the smell in its absence or emitting the smell. The word '*Chandanamivaavaati'* denotes either olfactory disorder like parosmia (qualitative wrong perception of odours) (*Apradhaturva Pradhaturva Chanadanamivaavaati*) or phantosmia (perception of odours in the absence of a relevant odour source) (*Apradhaturva Pradhaturva Chanadanamivaavaati*). Patients may perceive some other odour after being presented with an odour of roses (similar to *Chandana*), denotes a distorted odorous perception (*Iva Aavaati*). Parosmia patients may also perceive different odours (*Apradhaturva Pradhaturva*) qualitatively smell more or less the same (*Chanadanamivaavaati*). Parosmia and/or phantosmia can be seen in viral URTIs, after skull-brain trauma, sinusitis, infected paranasal sinuses, polyposis nasi, aging (*Swastha*), neurological illnesses (PD, Alzheimers disease - AD, DLB, MSA, Huntington's disease, MND, Friedreich's ataxia, PSP, corticobasal degeneration, spinocerebellar ataxia, idiopathic parkinson's syndrome - IPS and epilepsy), pathologies which involve orbitofrontal cortex, vitamin deficiencies, thyroid disorders, kidney and liver failure, intranasal carcinomas and malignant brain tumours (*Aatura Na Sa Jeevati Taadrusha*). Notable consequences like weight gain (*Pradhatu*) or weight loss (*Apradhatu*) are one among the three criteria's mentioned in the classification of qualitative smell disorders (*Chandanamivaavaati*).[83]

Hundreds of volatile organic compounds (VOCs) are emitted (*Chandanamivaavaati*) from the human body depends upon various factors such as age, diet, gender, physiological status and genetic phenotype (*Swastha*). Disease specific VOCs (*Aatura*) can be used as diagnostic olfactory biomarkers of infectious, metabolic, genetic disorders and other diseases. Body odours are unique to individuals and they can be considered as 'odour finger prints.' Qualitative and quantitative changes in VOCs (*Apradhaturva Pradhaturva Chanadanamivaavaati*) can occur in different disease conditions (*Aatura*) or various physiological variations (*Swastha*). VOCs are specific to certain diseases (*Aatura*). Diagnosis of a specific disease (*Aatura*) can be made by the odour emitted by the patient (*Chanadanamivaavaati*).[6] The present verse denotes either parosmia and/or phantosmia associated with various fatal underlying conditions or disease specific VOCs.

'Yuthikotpanna gandashcha -- yo vaati na sa jeevati' (Verse 14).[4]

Person is unable to perceive the smell of jasmine flowers (*Yuthikotpanna Gandhashcha*) and maintain energy levels (*Balya*?) even without having food (*Abhakta*), such a person will not survive for long (*Yo Vaati Na Sa Jeevati*)..[4] Description of the present verse according to another text is, 'a person who has a garland (*Yuthika*) of goitres (*Gandashcha*) and also moves (*Vaati*) about as if he has a '*Vartma'* disease, such a person will not survive (*Na Sa Jeevati*)..[3] Both of these versions have declared that the present verse (*verse* 14) can't be translated in a meaningful way due to errors in the original script.[3,4] According to the context, the present verse represents olfactory disorder (the person unable to perceive the smell of jasmine flowers) associated with some gastrointestinal disturbances. Anosmia (*Yuthikotpanna Gandhashcha*) and hyposmia are defined as the inability or reduced ability to smell and it can be caused by aging, chronic sinonasal diseases, severe head trauma, URTIs and neurodegenerative diseases (*Na Sa Jeevati*). Anosmia patients have reported loss of appetite (*Abhakta*?) without any changes in their healthy eating patterns, food intake, or nutritional status (*Balyo*?). Afflicted individuals with anosmia (*Yuthikotpanna Gandhashcha*) may change their food preferences (*Abhakta*?), trying to use non-olfactory sensations to maintain food enjoyment, which may result in weight gain (*Balyo*?).[84] Though the description of the present verse is unclear as cited by various authors,[3,4] it can be understood according to the context as a condition of anosmia (generalized or specific) associated with fatal underlying disease.

'Dvishadbhi kurute sakhyam ya -- paretam tasya jeevitam' (Verse 15).[4]

A person who makes friendship with enemies (*Dvishadbhi Kurute Sakhyam*) and enmity with friends (*Priyairyati Vipriyam*) and also get angry (*Kupyate*) suddenly (*Akasmaat*) without having any apparent reason, such a person will die soon (*Paretam Tasya Jeevitam*).[4] The present verse denotes social inappropriateness or behavioural disinhibition or behavioural and psychological symptoms in dementia (BPSD) seen in neurodegenerative disorders or dementias. BPSD includes depression, anxiety, agitation & aggression (*Kupyate & Vipriyam*), apathy, disinhibition (*Kurute Sakhyam*), hallucinations, delusions, irritability & emotional lability (*Kupyate & Vipriyam*), euphoria, and aberrant motor, sleep, and eating behaviours. One major BPSD domain seen in AD patients is the hyperactivity–impulsivity–irritiability–disinhibition–aggression–agitation (HIDA) domain.[85] Behavioural abnormalities (*Dvishadbhi Kurute Sakhyam*, *Priyairyati Vipriyam* and *Kupyate*) like aggression (*Kupyate*) seem to occur more in advanced dementia (*Paretam Tasya Jeevitam*). Behavioural disturbances like physical violence, hitting, accusatory behaviours (*Kupyate*) and suspiciousness (*Priyairyati Vipriyam*?) can be found in dementias. Aberrant motor behaviour and agitation/ aggression (*Kupyate*) are more common in patients with advanced dementia (*Paretam Tasya Jeevitam*). Personality changes (*Dvishadbhi Kurute Sakhyam*, *Priyairyati Vipriyam*) are most common in AD and Frontotemporal dementia (FTD). Loss of personal and social awareness, decline in social interpersonal conduct (*Priyairyati Vipriyam*), loss of insight, and emotional blunting are characteristic features of FTD. Physical aggressiveness (*Kupyate*) is one of the most serious and challenging behavioural disturbances in dementia (*Paretam Tasya Jeevitam*).[86] Impairment of social cognition (the cognitive ability to process social information coming from others) such as emotions, to attribute mental states to others, and to respond appropriately to them (*Dvishadbhi Kurute Sakhyam*, *Priyairyati Vipriyam* and *Kupyate*) is

often at the origin of behavioural manifestations in neurodegenerative disorders. Socially inappropriate behaviours like loss of empathy, inappropriateness of affect (*Kupyate*), and disinhibition (*Dvishadbhi Kurute Sakhyam*?) are frequently reported in FTD and AD.[87] Socially inappropriate behaviours such as staring, inappropriate physical contact and sexual behaviour with strangers (*Kurute Sakhyam*?), verbal or physical aggression (*Kupyate*), loss of manners or decorum, preference for crass jokes, slapstick humour and inappropriate clothing, undue familiarity (*Kurute Sakhyam*?), disproportionate jocularity (*Dvishadbhi Kurute Sakhyam*?), physical violence (*Kupyate*) etc are seen in FTD and AD. Behavioural and cognitive disinhibition (*Kurute Sakhyam*?) can be found across several neurodegenerative diseases (FTD, AD, PD, PSP and Huntington's disease).[88]

'Ebhirevamvidhairlingai -- bhishaganvitamaaturam' (Verse 16).[4]

A wise (*Medhavi*) physician (*Bhishak*) should not attempt to treat (*Nopakrameta*) a patient (*Aaturam*), who comes with the fatal signs and symptoms as explained in the previous verses (verses 1-15) (*Ebhi Evam Vidhai*) and also other conditions (*Anyaishchaapi Yathaayatham*) similar to them.[4] Attempts to treat fatal conditions and incurable diseases may cause loss of fame and reputation to the physician. Physician should avoid treating (*Nopakrameta*) incurable conditions to maintain or to protect his dignity and reputation. Physicians are required to use their expertise (*Medhavi Bhishak*) while prognostication in identifying various *Arishta Lakshanas* described in *Indriya Sthana* of *Bhela Samhita*. *Arishta Lakshanas* documented in the present chapter (*Avaakchitiyam Adhyaya*) and in the other chapters of *Indriya Sthana* are for example purposes only (*Ebhi Evam Vidhai*) and they don't include all possible forms (*Anyaishchaapi Yathaayatham*).[5]

'Etatbhishagarishthaanaam -- sa bhishak shaastra kovida' (Verse 17).[4]

A physician (*Bhishak*) who is well versed in *Ayurveda* (Indian system of medicine) (*Yathoktam Veda Vedaayu*) or having expertise in the knowledge of prognosis or *Arishta Lakshanas* (fatal signs and symptoms as explained in the present chapter and previous chapters of *Indriya Sthana* of *Bhela Samhita*) (*Arishta Gnaanam Anubudhyate*), such a physician is considered as skilful (*Shaastra Kovida*).[4] Proper knowledge of *Arishta Lakshanas* (*Arishta Gnaanam Anubudhyate*) makes the physician (*Bhishak*) confident while prognostication. Clinically experienced physicians (*Yathoktam Veda Vedaayu*) have shown better performance (*Shaastra Kovida*) than other physicians who are less experienced in prognostic knowledge (*Arishta Gnaanam Anubudhyate*).[5]

Conclusion

Avaakchitiyam Adhyaya is the twelfth chapter of *Bhela Indriya Sthana* which consists of 17 verses. Clinical interpretation of the verses (1-15) denote various fatal conditions having poor prognosis such as estimation of prognosis based on body shadows, orbital asymmetry with exophthalmos and enophthalmos, paralytic lagophthalmos, Bell's palsy, ocular myopahties, eyebrow asymmetry associated with various neurological or neuro-ophthalmological disorders, analgesia in peripheral neuropathies, neuropathic pain with mood disorders, scleroderma, NL, rubeosis faciei, eczema herpeticum, ectopic ACTH syndrome, saddle nose deformity, RPC, thermoregulatory disorders with autonomic neuropathies, myodesopsia, cenesthopathy, organic brain syndromes, cervical dystonia or torticollis with focal anhidrosis, URTI & LRTIs causing septicaemia, SIRS, MODS and septic shock, IBD with its complications, VSS, Qualitative smell disorders, disease specific VOCs, generalized or specific anosmia, BPSD in neurodegenerative disorders or dementias and importance of prognostic knowledge to the physician. The contents of '*Avaakchitiyam Adhyaya*' seem to have prognostic significance and clinical applicability. The present study provides inputs for future research works.

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