UNDERSTANDING PARKINSON'S DISEASE (PD) IN AYURVEDIC PROSPECTIVE

Nimmi M Menon1*, Manjunath Adiga2, Amritha E Pady3

*1PG Scholar, 2Professor, 3Assistant Professor, Kayachikitsa Department, Sri Kalabyraveshwara Swamy Ayurvedic Medical College, Hospital & Research Center, Bangalore, Karnataka, India.

ABSTRACT

Parkinson’s disease (PD) known as Kampavata in Ayurveda, is a degenerative neurological disorder of central nervous system, mainly affecting the motor system. It is the major cause of disability in the aging society, which usually affects after the age of 50 years. This disease is increasing in its frequency with the world population showing an incidence of 1-2 per 1000 population and has equal sex distribution. Symptoms like Kampa (Tremor), Stambha (Rigidity), Chestasanga (Bradykinesia and Akinesia), Vakvikriti (disturbance in speech) etc were described in different contexts of Charaka Samhita, Susruta Samhita and Basavarajeeyam. There is no cure for Parkinson's disease, but medications, surgery and multidisciplinary management can provide relief and improve the quality of life of the individual. In the treatment aspect, the drug L-Dopa has shown better results similarly Ayurvedic drugs having the similar compounds are useful in this disorder. Based on the symptoms manifested, the disease can be correlated to Kampavata mentioned in Ayurveda classics. Despite of so many advances in the field of medicine, treatment of PD remains highly symptomatic. This instills the need for Ayurvedic management of Kampavata. The present article is intended to focus on the Nidana, Lakshanas, Samprapthi and the management principles of Parkinson's disease (Kampavata).

KEYWORDS: Parkinson's disease (PD), Kampavata. Understanding Kampavata in Ayurveda, Vepathu

INTRODUCTION

Parkinson’s disease (PD) was first described by an English physician James Parkinson in 1817 under the term "the shaking palsy" and later named to his honor. He described the disease as “involuntary tremulous motion, with lessened muscular power, in parts not in action and even when supported; with a propensity to bend the trunk forwards, and to pass from a walking to a running pace: the senses and intellects being uninjured".[2] Parkinson's disease (PD) is the second commonest neurodegenerative disorder after Alzheimer's disease (AD).[3] It is more common in older people. It affects 1% of adults over the age of 60 years, with frequency in older age groups: Both sexes- male and female are affected equally.[4]

The incidence and prevalence of PD in European countries was estimated at approximately 108 to 257/100,000 and 11 to 19/100,000 per year, respectively, but it varied from country to country. The prevalence in Asia countries is slightly lower, all-age prevalence varied from 51.3 to 176.9/100,000 persons and the incidence from 6.7 to 8.7 per 100,000 persons per year.[5] The cardinal features of the disease includes rest tremor, rigidity, bradykinesia (slowing), and gait impairment. Features like freezing of gait, postural instability, speech difficulty, autonomic disturbances, sensory alterations, mood disorders, sleep dysfunction, cognitive impairment and dementia can be included as the additional features.[6] The important physical symptoms of PD are also a blank stare (the so called "Parkinson's mask" and troubles with manual dexterity.[7] The basic pathology is the degeneration of neurotransmitter dopamine from the dopaminergic neurons of the substantia nigra. Normally, there is an equilibrium between acetylcholine and dopamine. With dopamine depletion, there results in the hyperactivity of acetylcholine which is the cause of Parkinsonism group of nerve cells deep within the centre of the brain in an area called substantia nigra.[8] In Ayurveda classics based on the clinical presentations, Parkinson's disease (PD) can be correlated to Kampavata having Lakshanas such as Karapada tala kampa (tremors in hands and legs), Dehabbramana (postural instability), Matiksheena (dementia), and Nidrabhanga (sleeplessness). Vata
being the motivator and controller of other two Doshas, is responsible for the manifestation of almost all the diseases. In Charak Samhita it is said that if Vata dosha becomes imbalance then it produces 80 types of Vata nanatmaja vyadhis, Vepathu is a one of them which is commonly known as Kampavata. Vata vyadhis includes major neurological problems. Kampavata is one among them. The term Kampavata is comprised of two terms- Kampa + Vata. The word Kampa means ‘to move’ or ‘to shake’ ie, “Gatradi chalanam”[9] and Vata is one among the three humors of the body, can be understood as “Va-gati gandhanayohno”. Gati and Gandhana are the two important functions of Vata i.e., all the motor and sensory functions in the body are governed by Vata.

In Rigveda, it is mentioned that the Lord Indra suffered from Vepathu.[10] It is also available in the literature of Atharveda in the name Vepathu.[11] Acharya Charaka has included Vepathu in the Nanatmaja disorders of Vata.[12] Acharya Sushruta has mentioned the symptoms like Chestasanga, Stambha and Gurugatrata in the condition of Kaphavrita Vyana[13]. Shthamha and Kampa are mentioned in Snayugatavata.[13]

As per Astanga Hridaya, Kampa is found as a symptom in Vata prakopa (vitiation of Vata) and Sarwanga Vata. Kampa is noted in Raktkshaya, Pittakshaya and Kaphkshya condition according to Astanga Sangroha. For the first time Acharya Madhava has mentioned the disease Vepathu in a separate chapter in his work “Madhava Nidana” in which he mentioned that Vepathu is characterized by Sarvanga kampa (tremor all over body) and Shiro kampa (tremor in hand).[14] In Bhasajya Ratnavali, Chakradatta and in Vangasena many medicines for the treatment of Kampavata are mentioned. Sharangha Samhita has mentioned the Kampavata in the Nanatmaja vyadhi of Vata. In Basavarajeeyam, more detailed diagnostic approach mentioning the symptoms of the disease has been mentioned.

**Physical Abnormalities in Parkinsonism**[19]

### Aetiology

The Parkinson’s disease (PD) may be idiopathic or secondary to some definable cause e.g. drugs, toxins, hypoxic, post encephalitic, vascular (atherosclerotic) or metabolic. Familial clusters of autosomal dominant and autosomal recessive forms of PD comprise of 5% of cases.[15] All the Samanya nidanas explained for Vata vyadhi can be considered as Dosa hetus which are responsible for Vataprakopa, in turn leading to Kampavata.

**Nidana Panchaka**

**Nidana**

Kampavata is a Vatika disorder, so the causative factors which provoke Vata can be considered as the etiological factor. Use of Alpa, Laghu, Rooksha, Sheetha, Katu, Kashaya, Tikta, Masoora, Mudga, Raktashali, Rajamasha, Shyama, Yavagu, Vishamahana, Atibhukta, Abhojana, Langhana, Adhovata Mutra Pureesha rodha, Ratri jagarana and Manasika nidanas like Chinta, Bhaya, Dukha Krodha Shoka.[16]

**Purvarupa**

Kampavata as one of the Vatavyadhi which does not have any Purvarupa as Acharya Charaka says Auyakta Lakshana is the Purvarupa of Vata vyadhi.[17] In Parkinson’s disease (PD), about one third of the patients experience Vague and non-specific symptoms before the onset of actual cardinal features. Early complaints include fatigue, aches and pain, which may be restricted to one side of the body, feelings of tension and irresistible restlessness. Pain and needles on one hand, burning sensations, drenching sweats, blurred vision, internal feeling of tremulousness, cramps of thigh and calves and other are common experiences.

**Rupa**

Lakshanas of Kampavata such as Karapadatala Kampa, Dehabhramana, Nidrabhanga, Maiksheena are mentioned in Basavarajeeyam.[18]


**Abduction/adduction of thumb**

**Supination/pronation of forearm**

May affect arms, legs, feet, jaw, and tongue.

Intermittent, present at rest and when distracted.

**Kampa (tremor)** is found in many part of body like Shirkampa (tremor in head), Hasta kampa (tremor in hands), Pada kampa (tremor in legs).

**Rigidity (Sthambha)**

- Cogwheel type, mostly upper limbs
- Plastic (lead pipe) type, mostly legs

**Bradykinesia (Chestasanga)**

- Slowness in initiating or repeating movements
- Impaired fine movements, especially of fingers

**Tremors (Kampa)**

It is the main symptom associated with Parkinson disease. The involuntary rhythmical shaking normally occurs at rest and tends to reduce or stop when the affected part is used for some activity. Although the hands are often affected, some patients experience tremor of the jaw or foot. The tremor affecting the thumb and first finger produces the commonly called ‘Pill rolling’ effect.

**Rigidity (Sthambha)**

It is actually the hyper tonicity of the muscles. The muscles become continuously or intermittently firm and tense. All muscle groups can be affected. The increase in muscle resistance occurs when there is passive movement: unlike spasticity where sudden relaxation can occur after movement has begun.

**Bradykinesia (Chestasanga)**

The word Chesta means to move and Sanga means obstruction. So here Chestasanga means obstructed movements or reduced movements. Vyana vayu carries out all the movements. Disturbance in the function of Vyana vayu leads to Chestasanga. Bradykinesia is defined as slowness or poverty of movement with loss of automatic stereotyped movements.

**Flexed posture (Avanamana)**

Avanamana means to bend down or flexed downwards. Acharya Vadhvatta attributed Avanamana as a sign of aging and Vata dosha will be the dominant Dosha in old age. The patient of PD involves flexion of head, trunk and extremities ie, stooped posture.

**Gait abnormalities (Gatisanga)**

In addition to the postural abnormalities and loss of arm swing, the patient generally takes small shuffling steps, difficulty in beginning to walk and to stop –‘Festinating’ / ‘Hurrying Gait’.

**Monotonous Speech (Vak vikriti)**

Vak (speech) is the function of Udana vayu, any disturbance in it interfere with the fluency of speech. Rooksha guna of Vata is responsible for low, broken, dry, and obstructed voice. The patients presents with reduced volume of voice, being unable to shout, or to speak above the whisper.

**Depression (Vishada)**

Derangements in the function of Udana vayu leads to Vishada. Depression can further contribute to memory loss and confusion.

**Impairment in Memory (Smritihani)**

Smriti is dominating function of Udana vayu. Any impairment in its function leads to Smritihani. Some patients with PD suffer significantly with memory loss. The exact cause is unknown.

**Constipation (Vibandha)**

Apana vata dushti significantly contribute for the production of Vibandha in these patients. Constipation is very common symptom in these patients.

| Lakshanas of Kampavata | Symptoms of Parkinson’s Disease |
|------------------------|--------------------------------|
| Kampa                  | Tremor                        |
| Dehabhramana           | Postural Changes              |
| Nidrabhanga            | Insomnia                      |
| Matiksheena            | Dementia                      |

**Upashaya and Anupashaya**

No reference regarding Upashaya and Anupashaya of Kampavata is mentioned in the classics, therefore all the factors that aggravate Vata can be considered as Anupashaya and that which pacifies Vata can be considered as Upashaya.
Samprapthi
According to Ayurveda

PD is a disorder of the extrapyramidal system, which includes motor structures of the basal ganglia, and is characterized by the loss of dopaminergic function and consequent diminished motor function, leading to clinical features of the disease.\(^{[22]}\)

The control of the voluntary motor activity is the main function of basal ganglia. Basal ganglia are comprised of a group of subcortical nuclei that include striatum (putamen and caudate nucleus), subthalamic nucleus (STN), globus pallidus pars externa (GPe), globus pallidus pars interna (GPI), and the substantia nigra pars compacta (SNc).\(^{[23]}\) Unlike most other components of the motor system, the basal ganglia do not make direct connections with the motor neurons in the spinal cord. Their influence on motor activity is exerted indirectly through their connections with the motor cortex. The prominent input to the basal ganglia comes from all parts of the cerebral cortex and terminates in the striatum. Cortical input to striatum excites two separate but parallel striatal pathways.

- Direct motor circuit through the basal ganglia leads to the cortical activation of basal ganglia resulting in the facilitation of selected motor programs.
- Indirect motor circuit results in the cortical activation of striatum, suppresses the unwanted motor programs.

The loss of dopamine in the striatum of PD patients results in increased activity in the GPI/SNpr circuits and subsequent gamma aminobutyric acid (GABA) dysfunction, leading to inhibition of the thalamus. The end result is the decreased ability of the thalamus to activate the frontal cortex, resulting in the decreased motor activity characteristic of PD leading to Bradykinesia (Chestasanga).

The gamma motor neuron of spinal cord is responsible for maintaining the tone of the muscles. The muscle tone is dependent upon muscle spindle fibers, Basal ganglia especially the substantia nigra controls the gamma motor neurons and muscle spindle fibers lesions of this area will lead to increased tonicity leading to rigidity (Stambha).

Control of the automatic associated movements, swinging of arms during walking, appropriate facial expressions and other movements associated with motor activities are called automatic associated movements, thus lesions of basal ganglia cause absence of these movements resulting in poverty of movements, face without appropriate expression leading to Masked face.
Pathology according to Modern science

Lewy bodies have been invariably recognized as the major pathological feature of PD. The diagnosis of PD is rarely confirmed without the presence of Lewy bodies in the substantia nigra.

Samprapti Ghataka

| Dosha          | Vata (especially Prana, Udana and Vyana) |
|----------------|------------------------------------------|
| Dushya         | Mastulunga majja, Snayu                  |
| Srotas         | Vatavaha                                 |
| Srotodushti    | Atipravritti                             |
| Udbhavasthana  | Pakvashaya                               |
| Adhishgthana   | Mastishka                                |
| Sancharasthana | Rasayani                                 |
| Vyaktasthana   | Sarvashareera                            |
| Vyadhi Marga   | Madhyama                                 |

Differential Diagnosis

| Disease                      | Diagnosis                     |
|-------------------------------|-------------------------------|
| Idiopathic Parkinson's disease| Drug induced Parkinsonism    |
| Essential tumor              | Multisystem atrophy           |
| Progressive supranuclear palsy| Huntington's disease          |
| Normal pressure hydrocephalus | Post traumatic Parkinsonism   |

DISCUSSION

Parkinson’s disease known as Kampavata in Ayurveda, is a degenerative neurological disorder of central nervous system, mainly affecting the motor system commonly affecting the older age group. The pathology is due to the degeneration of a group of nerve cells deep within the centre of the brain in an area called substantia nigra which use Dopamine as their neurotransmitter to signal other nerve cells. As these cells degenerate and stop functioning, Dopamine fails to reach the areas of brain that affect motor functions. Therapy for Parkinson's disease is aimed at replacing dopamine and to prevent the degeneration which is caused due to impaired Vata. Since the blood brain barrier prevents dopamine from entering the brain from blood stream, a precursor of dopamine (L-dopa, Levodopa) that will enter the brain is given. Kapikacchu (Macuna pruriens) contains Levodopamine or L-dopa within its seeds which can be opted as natural Levadopa. Kampavata is correlated with Parkinson’s disease which is Dhatukshyaja, Vatayadhi, and Apatarpana in nature.

Hence the principle of treatment should aim at the general line of Vatavyadhi chikitsa based on the specific etiology, Santarpana Chikitsa and Rasayana.\(^2\)\(^4\)\(^2\).

Acharya Vangasena has mentioned specific treatment for Kampavata such as Abhyanga, Swedana, Virechana, Anuvasana basti, Niruha basti and Shirobasti.\(^2\)\(^5\)
Snehana (oleation)

Acharya Charaka opines, Snehana is the first line of treatment for all Vatavyadhis. Abhyantyara sneha (Internal)- Through Bhojana (food), Pana (drinks), Nasya and Basti.

Bahya Sneha (External)- Abhyanga, Mardana, Lepa, Moorhini taila etc.

Abhyanga

Help in ensuring softness and unctuousness of the skin. The Veerya of the Abhyakta sneha will reach the Uttarottara dhatus and gives the desired effect. It clears the Srotas, builds up stamina, increases blood circulation, prevents old age, removes tiredness and pain in the body, induces sleep, improves eyesight and complexion of the skin.

Swedana (Fomentation therapy)

Helps in relieving from Stambha, Guruta and Sheetata.[26]

Virechana

Acharya Charaka has mentioned Virechana as a Sodhana karma for the treatment of Vatavyadhis. But in all Vatavyadhis, Mrudu virechana with Snehasamuykta oushadhis are advised. It imparts Bala to Indriyas, does Agnideepana and Koshasthuddhi.

Basti karma

Basti is said to be the best treatment for vitiatiated Vayu, which is the chief cause of Kampa Vata. When Vayu is controlled by the action of Basti all the other disturbed body elements fall into rhythm and equilibrium.

Nasyakarma

Acharya Vagbhata has stated "Nasa hi nshhiraso dwarram" i.e., nose is the easiest and the closest opening for conveying the potency of medicines to the cranial cavity. Acharya Chakradatta and Acharya Vangasena have indicated Nasya karma for Kampavata.

Shiro Basti

It is the most potent form of Moordhini taila.[27] Helps to alleviate vitiatiated Doshas and does Indriya shuddhi. This is mainly indicated for Shirakampa. By doing Shiro basti and Shirodhara patient feels relaxation both physiologically and mentally. Relaxation decreases brain cortisone and adrenaline level, synchronizes the brain wave, strengthens the mind.

Parkinson’s disease (PD) is an age-related neurodegenerative disease, characterized by relatively selective nigrostriatal dopaminergic degeneration. Current therapies have not proven effective to modify the disease progression in PD. Now a day’s patients of Parkinson’s disease are opting for Ayurveda management due to the long term complications of Levodopa and other medications. The herbal drug Kapikacchu is having Dhaturviddhikara, Vatashamaka and Sukraviddhikara properties.[20] It helps against the process of degeneration and may be beneficial in the condition of Dhatukshaya. It also corrects the function of Indriyas, which are found impaired in Kampavata. In addition, Zandopa (Mucuna Pruriens), having L-dopa which has anti-parkinsonism activity.[29]

CONCLUSION

Kampavata (Parkinson’s disease) needs the Rasayana (rejuvenation therapy). Ayurvedic Panchkarma procedures can make life of the patients much easier and drastic increase in their life expectancy can be seen. Both Samshodhana and Shamana Chikitsa play an important role to improve the Activities of daily living of a PD patient.

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*Address for correspondence
Dr. Nimmi M Menon
PG Scholar,
Kayachikitsa Department,
Sri Kalabryaveshwara Swamy Ayurvedic Medical College, Hospital & Research Center, Bangalore, Kamataka, India.
Email: nimmi.menon@gmail.com
Mobile: 9739794158