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Majja Prayoga - a novel perspective in management of Neurodegenerative Disorders w.s.r. to Parkinson's Diseases - A Review

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ABSTRACT

Parkinson's disease (PD) is a chronic progressive neurodegenerative movement disorder characterised by a profound and selective loss of nigrostriatal dopaminergic neurons. Incidence and prevalence of PD increases with advancing age, being present in 1% of people over the age of 65 years. Early-onset PD is defined as the onset of parkinsonian features before the age of 40 years. It accounts for 3-5% of all PD cases. PD is more common in men than in women. Ayurveda perceives it as a *Vyadhi* (disease) characterised by the *Gati Kshaya* – hypokinesia later progressing into *Prakopa* of *Vata* to uncontrolled involuntary movement. The disease characterised by the symptom triad – Bradykinesia, Resting tremor, Cogwheel rigidity and also with postural instability in some texts. A major hurdle in development of neuroprotective therapies are due to limited understanding of disease process leading to the death of dopaminergic neurons, where the aetiology remains to be elusive, even though the studies are on. The principles of Ayurveda regarding the understanding of a disease as *Vatavyadhi* in terms of Neurodegenerative Disorder is multidimensional and is enriched with rational principles that can be implemented in clinical practice. A new perspective and focus are given on *Majja Prayoga* (Bone marrow use). Application of animal marrow for reforming the deranged *Vayu* and degenerated *Dhatu* (neurons) is been emphasized. The rationality behind the *Majja Prayoga* in the *Samprapti Vighatana* of Parkinsonism is introduced. This study highlights the insight of Ayurveda about Parkinsonism right from the *Nidana* running down to the *Chikitsa* aspect.

Key words: Bone marrow, *Majja*, Neurodegenerative Disorder, Parkinson's disease, *Vatavyadhi*.

INTRODUCTION

Vata being a dynamic factor known for its *Gati* (Movement) and *Chala* possess the *Naisargika Gunas* (Unique feature) like *Shabdha* (voice) and *Sparsha* (touch), *Prakritika Gunas* (natural quality) like *Rajoguna Bahulam* and *Bhoutika Gunas* like *Rukshadi*

(dryness) are naturally responsible for causing a greater number of ailments in the human body than the other *Doshas*.^[1-3] *Atharvaveda* mentions the location of *Vata* in the upper portion of *Mastishka* (brain).^[4] *Acharya Charaka* quotes the *Shiras* (head) indicating the *Mastishka*, occupies the prime place amongst the vital senses are located in *Shiras* that is *Mastishka*. Therefore, *Mastulunga Majja* (~Basal ganglia)^[6] is located in organs of body and is the *Sthana* (place) for all five *Indriya Buddhis*;^[5] which conclusively perceive that the five senses, the *Shiras* and its nature is *Snigdha* (unctuous) resembling *Medas* (fat). Therefore, the qualities of brain and the brain tissues should be *Snigdha*, *Slakshna*, *Guru*, *Mridu*, *Picchila* and *Sandra* similar to those of *Sneha Dravya*.^[7] Therefore, it may be noticed that the brain is important seat of *Vata* with predominant qualities of *Vayu* and *Akasha* has the qualities which are opposite to those of *Vata*. Hence, it is clear that the

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constant exposure to those *Aahara* (food), *Vihara* (lifestyle) and *Aushadha* (medicines) possessing the *Rukshadhi Guna* cause abnormal functioning of *Vata* by probably altering the composition of its *Asraya* (site) and creating an imbalance in the relationship between *Asraya* (site) and *Asrayee* (the one who reside in site).

In the light of understanding the disease of Parkinsonism through Ayurveda, it can be categorised under *Vatavyadhi* (~ neurological disorders) characterised by *Gati Kshaya* i.e., hypokinetic or akinetic disorder affecting the *Mastulunga Majja* (~Basal ganglia) occurring mostly between the age of forty-five to seventy years, with the peak incidence in the sixth decade of life and is infrequent less than thirty years of age.

MATERIALS AND METHODS

The data was collected from Ayurvedic texts and research papers. Ayurvedic texts mainly used for this study are *Brihatriyji*, *Laghutriyji* and other ayurvedic texts books. We also referred some modern texts books, journals and various websites to collect information on this topic.

AIM OF THE STUDY

To understand the rationality behind the *Majja Prayoga* in the *Samprapti Vighatana* of Parkinsonism.

Nidana instigating Parkinson's Disease

First cause is *Vardhakya* i.e., due to *Prakruti* or physiological ageing. Modern science says that there is a considerable reduction in the dopaminergic neurons and non-pigmented neurons with the age. But, in case of Parkinson's brain, there is a 30% more reduction of neurons than the normal aged controls.^[8]

Second etiology is *Rasapradosha*, that in conventional system we can comprehend as various genetic mutations involving the locus of PARK 1 to 10. An example of PARK 1 locus with alpha synuclein gene, lead to the aggregation of protein filament forming Lewy bodies to Parkinson's disease.^[9,10]

Third cause is *Deha Karshana* (emaciation), due to any chronic *Vyadhi*, which in contemporary science

reckons the Parkinson's disease generating secondary to a disease, drug or treatment, diet or regimen. An example can be quoted as the Parkinson's generating from encephalitis or any vascular causes like arteriosclerotic or arteriopathic changes or from a drug like metoclopramide.^[11]

The fourth and the last cause is *Dhatu Visheernata* due to *Oja Kshaya* (loss of essence of all body tissues). *Oja Kshaya* reduce the immunity of the person and weak immunity play a major role in manifestation of movement disorders due to the presence of autoantibodies, T- cell mediated process and other wide variety of immune mechanisms.^[12]

Samprapti (Pathogenesis)

Shiras, the abode of *Mastulunga Majja* possessing *Snigdha*, *Slakshna*, *Guru*, *Mridu*, *Picchila* and *Sandra Gunas* i.e., similar to that of a *Sneha Dravya*.^[13-15] The interesting point to be noted is the brain i.e., the *Mastulunga Majja* with the *Snehadi Gunas* is the abode of *Vata Dosha* with exactly opposite qualities. So, their equilibrium is reflected as a proper function derived from a proper structure.

So, with the constant exposure of an individual to *Rukshadi Aahara*, *Vihara*, *Aushadi* or with *Prakruti* and other factors previously mentioned causing abnormal functioning of *Vayu* by altering the composition of its *Ashraya* i.e., the brain tissues, resulting as an imbalance in the structure and functioning.

As a result of this there is a *Snehamsha Kshaya* i.e., *Kshaya* of *Mastulunga Majja* i.e., brain or *Substantia Niagra*. Thereby progressing to *Majja Shosha* i.e., dopamine deficiency.^[16] This is nothing but *Dhatu Kshaya*, where *Vata Prakopa* is certain. There is abnormality of *Gati* and *Chalana* due to *Sanga* (obstruction), resulting *Vata Prakopa* that culminate in *Apravrutti*. The ultimate fate is the *Gandhana Hani* and *Gati Hani* to *Vayu*. They manifest as Parkinson's disease.

In this pathological cascade, the *Dosha* involved is *Vata Dosha*, *Dhatu* is *Majja Dhatu*. Thereby understanding the *Vyadhi* through its *Samprapti* helps in the *Samprapti Vighatana* i.e., we call as the treatment.

So, due to the *Khara* and *Rooksha Guna Pradhanata* in the *Samprapti*, the best *Sneha* that can be implemented is *Majja*.^[17]

Majja Prayoga (Use of bone marrow)

Majja is extracted out from the femur bone of *Mahisha* (buffalo).^[18] It is done by crushing the bones and then boiling (Fig. 1,2), until it appears like *Ghee* (clarified butter), followed by filtering of the extract using five folded cloth (Fig. 3,4). The filtered extract is imparted with the *Deepaniya Guna Dravyas*.^[19] Heating is done until the *Majja* preparation reaches *Mridupaka*. For external administration we can go for *Khara Paka*. So, how we can administer them in the patient? Measures for *Deepana* and *Pachana* have to be taken. Patient has to be assessed for his/ her *Agni* (digestive fire). Later, internally the *Majja Sneha* imparted with *Deepaniya Dravyas* can be administered at a quantity of 10 ml spaced twice in a day - morning and evening in *Shamana Matra* (approx. 10 ml).^[20]

Externally the *Majja Sneha* can be administered as in the form of *Shirobasti* (warm oil poured onto the head)^[21] and followed by *Shiropichu* (keeping sterile cotton pad on head dipped in herbal oil).^[22] *Shirobasti* requires two litres of *Sneha* and was retained for 40 minutes. *Shiropichu* was taken in sufficient quantity to soak the cotton laid over the scalp and is kept for 40 minutes.



Fig. 1: Crushing the bones

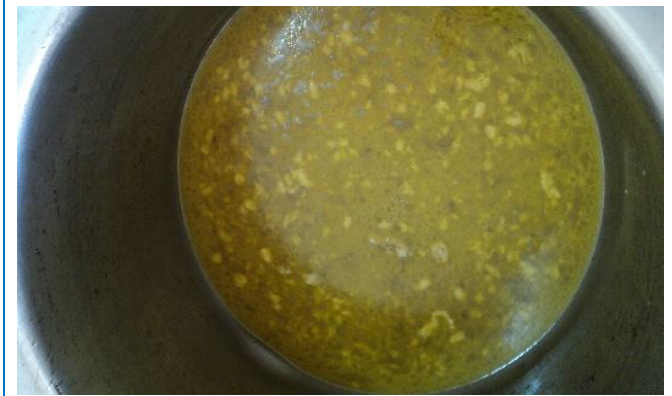


Fig. 2: Boiling over Mandagni



Fig. 3: Filtering using five folded cloth



Fig. 4: Mixing the Deepaniya Gana Dravyas

DISCUSSION

The *Majja Sneha* is metabolized in the GIT and is converted into fatty acid and glycerol. The resultant lipoprotein is circulated throughout the blood. It crosses the blood brain barrier, reaching the neurons. Lipoproteins react with the cell membrane. And it induces a free radical chain reaction inside the cells.

As the *Snehana* continued, collision of the free radicals with the lipoprotein occurs resulting in the termination of free radical chain reaction. *Snehana* helps in building up of excretable metabolic waste. Also, at the time *Snehana* enhances cellular excretion. The *Shamana Matra* of *Snehana* helps in stimulating and enhanced secretion of elements and also controls the phenomenon of blebbing.^[23] So, the neurons on the process of degeneration can be revived and thus helps in stimulating the pigmented neurons or dopaminergic neurons at different sites of the brain especially substantia niagra for the secretion of dopamine. In Ayurvedic perspective, it is because of the relation between the *Pittadhara Kala* (a kind of layer in body) and *Majjadhara Kala* ^[24] in its direct mode of action.

The external therapeutic measures like the *Shirobasti* and *Shiropichu* act by percolating through the skin because of its lipid base. The warm temperature maintained produces the local vasodilation, further increasing the circulation through the local arteries of the brain. This facilitates the supply of the *Sneha Dravya* to the target.^[25]

CONCLUSION

It is an amazing fact that the brain carries stem cells, which can enable new myelin, new insulation, to be laid down over the damaged.^[26] But the spontaneous endogenous repair should be reinforced through the external and internal therapeutics like *Majja Prayoga*. Recent studies reveal the perfusion of bone marrow stem cells (*Majja*) through blood helps in rejuvenating and reviving the degenerated neurons.^[27] These observations are justifying that the Ayurvedic principles as the backbone for tackling Neurodegenerative Disorders, where concepts of neuro protective principles and guidelines in Ayurvedic science as vast and scientific, hence highlighting the neuro protective and curative strategies of our good old science stay fervent with sturdy bedrocks in the highly competitive rational world.

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