

Critical Analysis of Gati (Gait) In Ayurvedic And Jyotish Science In Modern Perspective And Its impact On Socio economic Status And Health

Subhash D. Waghe^{*1}, Y.V. Rajyalakshmi Rao², Kavita Agrawal³

1. M.D.(Roga Nidana), HOD – Dept. of Roga Nidana & Vikruti Vigyana, KDMG Ayurvedic College, Chalisgaon – 424 101
2. M.A., M.Phill., Ph.D (Scholar – Vedang Jyotish), Kavi Kulguru Kalidas Sanskrit, Vishwavidyalaya, Ramtek, E-mail – yvrajyalakshmi@gmail.com (contact no. 9730034019)
3. Professor and HOD, Dept. Of – Samhita Siddhanta, Shri Dhanwantari Ayurveda College, Semari Chhata, Mathura (UP)-281401, E-Mail – kavita201@gmail.com, Mo.no. 9423145159

*Corresponding author: E-mail – carenidan@rediffmail.com (contact no. 7038000648)

ABSTRACT

Gati' refers to the distinct pattern of walking of an individual [सुख संचरित पादा स्यात् गतिः । नृ.सा.शा. 3/14]. It is one of the body parameter which needs to be examined under 'Ayu laxanas' (body characteristics) for the assessment of strength of the body as well as for futuristic outcome of health and wellbeing. In modern medical science, Gati is referred as the 'Gait' of the patient. There are many such Gaits (distinct walking patterns) are described in ancient Jyotish and Ayurvedic sciences and in modern medical science also. But Ayurvedic and Jyotish science take into consideration the general well being, socio economic status from Gait observation whereas modern medical science thinks of only disease patterns

from it. The Ayurvedokta and Jyotish shastrokta Gati (Gait) characteristics could also be studied in modern perspective and their role in disease identification needs to be explored on broader scale with the help of modern science.

The Jyotish science is complimentary and contemporary to the Ayurvedic medical science. The principles of Jyotish science have been applied in Ayurvedic science at various places. The various body characteristics and Gati (Gait) are described in 'Sharir Laxan Adhyay' and 'Ayurday Adhyay' of Ayurvedic and Jyotish science respectively. Acharya Charaka had described the 'Gati' in the Vimansthana chapter eight of his treatise 'Charak Samhita' under 'Dashvidha Pariksha' whereas acharya Kashyapa had described

it in Laxnadhya of sutrasthana of his treatise 'Kashyapa Samhita'. These Gati characteristics are used to predict the future outcome of health, education, and career and socio economic status. Literary review of literature related to Gati is done to study it critically and comparatively from Ayurvedic and Jyotish science. It is concluded that the Gati characteristics can be used as a parameter for predicting health and socio economic status. The persons having normal well organized walking pattern are immune to the diseases and have good health and fortune.

KEYWORDS – Pramana, Aayam, Vistar, Deergha, Parinah, Angul, measurement

INRODUCTION

'Gati' refers to the distinct pattern of walking of an individual [lq[k lapfjr iknk L;kr~ xfr% A u`-lk-"kk- 3@14]. It is one of the body parameter which needs to be examined under 'Ayu laxanas' (body characteristics) for the assessment of strength of the body as well as for futuristic outcome of health and wellbeing. In modern medical science, Gati is referred as the 'Gait' of the patient. There are many such Gaits (distinct walking patterns) are described in ancient Jyotish and Ayurvedic sciences and in modern medical science also. But Ayurvedic and Jyotish science take into consideration the general well being, socio economic status from Gait observation whereas modern medical science thinks of only disease patterns from it. The Ayurvedokta and Jyotish shastrokta Gati (Gait) characteristics could also be studied in modern perspective and their role in disease identification needs to be explored on

broader scale with the help of modern science. The Jyotish science is complimentary and contemporary to the Ayurvedic medical science. The principles of Jyotish science have been applied in Ayurvedic science at various places. The various body characteristics and Gati (Gait) are described in 'Sharir Laxan Adhyay' and 'Ayurday Adhyay' of Ayurvedic and Jyotish science respectively. Acharya Charaka had described the 'Gati' in the Vimansthana chapter eight of his treatise 'Charak Samhita' under 'Dashvidha Pariksha' whereas acharya Kashyapa had described it in Laxnadhya of sutrasthana of his treatise 'Kashyapa Samhita'. These Gati characteristics are used to predict the future outcome of health, education, and career and socio economic status. Literary review of literature related to Gati is done to study it critically and comparatively from Ayurvedic and Jyotish science. The Gati characteristics can be used as a parameter for predicting health and socio economic status. The persons having normal well organized walking pattern are immune to the diseases and have good health and fortune.

MATERIAL & METHOD

Literary method of research was adopted in the present study. Critical and comparative study of Ayurvedic literature and Jyotish science literature was done to come to logical conclusion.

REVIEW OF AYURVEDIC & JYOTISH LITERATURE

'Gati' Inspection As Parameter Under Ayu Laxanas

Acharya Varahamihir had also suggested to examine 'Gati' (Gait) under Ayu laxanas.

● आयुः उन्मान मान गति संहति सार वर्ण स्नेह स्वर प्रकृति सत्त्वं अनूकं आदौ क्षेत्र मृजां च कुशलो अवलोक्य सामुद्रविद् वदति ।। बृ.सं. 67/1

As per jyotish acharya Varahamihir, under Ayu laxanas, the parameters like height (*Unman*), weight (*Man*), gait (*Gati*), body built (*sanhati*), essence (*Sara*), complexion (*varna*), voice (*swara*), constitution (*Prakriti*) etc should be studied. [B.S. 67/1]

Definition of Gati

● सुख संचरित पादा स्यात् गतिः । नृ.सा.शा. 3/14

As per jyotish science, Gati is the distinct pattern of walking of an individual. [N.S.S. 3/14]

Some Walking Patterns As Per Ayurveda

● मत्तगजवृषभसिंहशार्दूलहंसगतयो अधिपतयः । का.सू. लक्षणाध्याय 28

The persons having walking pattern like excited elephant, ox, lion, panther, swan are happy like king. [K.S.Su. 28]

● स्तिमितगतयोः धन्याः । का.सू. लक्षणाध्याय 28
The persons having slow and stable walking pattern are rich. [K.S.Su. 28]

● चपलगतयः चपलसुखदुखलाभिनः । का.सू. लक्षणाध्याय 28

The persons having fast walking are alternately happy and unhappy. [K.S.Su. 28]

● तिर्यकगतयः तु अधन्याः । का.सू. लक्षणाध्याय 28

The persons having crisscross/zigzag pattern of walking are poor. [K.S.Su. 28]

● श्लेष्मलाः अवस्थितगतयः, विज्जलत्वात् सुश्लिष्टसारसन्धिबन्धनाः, तथाऽच्छत्वात् प्रसन्नस्निग्धवर्णस्वराश्च भवन्ति । त एवंगुणयोत् श्लेष्मला बलवन्तो वसुमन्तो विद्यावन्त ओजस्विनः शान्ता आयुष्मन्तश्च भवन्ति ।। (च.वि. 8/96)

The Kapha prakrti individual have well organized pattern of walking. They walk slowly but steadily. [C.Vi. 8/96]

● वातला सततसन्धिशब्दगामिनः च भवन्ति; त एवं गुणयोगात् वातलाः प्रायेण अल्पबलाः च अल्पायुषः च आल्प अपत्याः च अल्पसाधनाः च अल्पधनाः च भवन्ति ।। (च.वि. 8/98–100)

The Vata prakrti individual have unstable pattern of walking. They walk fast but unsteadily and their joints make sound while walking. [C.Vi. 8/98]

● तत्र सर्वैः सारैरुपेताः.....स्थिरसमाहितशरीरा सुसमाहित गतयः । (च.वि. 8/111)

The person having all the essences have balanced body with balanced movements.

● स्मृतिमन्तो.....सुव्यवस्थितगतिः.....च सत्त्वसाराः । (च.वि. 8/110)

The walking of Satwasara persons is well organized. [C.Vi. 8/110]

Some Male Walking Patterns As Per Jyotisha

सुख मयूर मार्जार सिंह गतितुल्याः सुभगा । नृ.सा. शा. 3/14

The males having walking pattern like peacock, cat, lion is normal and good. [N.S.S. 3/14]

दीर्घक्रमा सुलीला स्यात् गतिः सुभगा । नृ.सा.शा. 3/14

The walking in long steps is also good. [N.S.S. 3/14]

गतिः भवन्ति तुल्या ये च नरा द्विरद नकुल हंसानाम् । वृषभस्य अपि समासो सततं धर्म अर्थ तत्परः ।। नृ.सा.शा. 3/15

The males having walking pattern like mongoose, swan and ox are dutiful. [N.S.S. 3/15]

गोमायु करभ असभ कृकल शशक भेक मृगैः ।

येषां गति समाना ते गतसुखराजसन्मानः ।। नृ.सा. शा. 3/16

The males having walking pattern like fox, camel, donkey, rabbit, frog or deer

are devoid of happiness and government service. [N.S.S. 3/16]

विषमा विकटा मन्दा लघुकमा चंचला द्रुता
स्तब्धा। आभ्यान्तरा अथ बाहया लग्नपदा वा गतिः
न शुभा। नृ.सा.शा. 3/17

The males having irregular, unpleasant, slow, short unstable steps with pauses walking pattern is inauspicious and abnormal. Also, males having fast walking with their feets and knees rubbing with each other, pattern is inauspicious and abnormal. [N.S.S. 3/17]
धनिनां गमनं स्तिमितं समाहितं शब्दहिनं स्तब्धं।
ह्रस्व प्लुता अनुविध्दं विलम्बितं स्यात् दरिद्राणाम्
॥ नृ.सा.शा. 3/19

The males having continuous, regular, soundless walking pattern are rich whereas males walking in short steps with pauses are poor economically. [N.S.S. 3/19].

This is because rich peoples are confident and free of economic stress and walks with confidence and zeal. Whereas poor peoples are less confident and worried. Hence walks with confused state of mind in short steps with pauses.

Some Female Walking Patterns As Per Jyotisha

मत्तेन सन्निभपदा मदमत्त मतंग हंसगतितुल्या।
सुभगा गतिः सुललिता विलसति वसुधेशपत्नीनाम्।
नृ.सा.शा. 5/135

The woman walking like excited elephant, swan with well organized pattern is lucky and enjoy life like queen and highly placed socially. [N.S.S. 5/135]. This is like cool walking.

गो वृषभ नकुल मृगपति मयूर मार्जार गामिनि
नियतं।

सौभाग्य एश्वर्ययुता भाग्यवती भागिनी भवति। नृ.
सा.शा. 5/136

The woman who walks like cow, ox, mongoose, lion, peacock, cat is bestowed with luck and luxury. [N.S.S. 5/136]. All

these animal walk represents a 'cat walk' style of walking.

मण्डूक घूक वृक बक जम्बूक कोष्ठु सरट कपि
गतयः।

दौर्गत्य दुखसहिता जायन्ते युवतयः प्रायः॥ नृ.सा.
शा. 5/137

The woman who walks like frog, owl, wolf, fox, lizard, monkey are unlucky and has to suffer a lot. [N.S.S. 5/137].

The fox walk is little faster than normal walk generally involves the border of the sole hitting the ground first.

ह्रस्व प्लुता अनुविध्दा लसत्पदाभ्यान्तरबला बाहया।
स्तब्धा मन्दा विषमा लघुकम अशोभना न गतिः।
नृ.सा.शा. 5/138

The woman who walks in short steps initially and then in long steps with pauses with rubbing of legs internally or bends externally has a abnormal gait. Also who walks slowly with pauses, irregularly in short steps has inauspicious and abnormal gait. [N.S.S. 5/138]

निःस्वा विलम्बितगतिः विषमगतिः विषमानसा
योषित्।

दासी कुरंगमना कुलटा द्रुतगामिनी भवति॥ नृ.सा.
शा. 5/139

The woman who walks slowly is poor. The woman who walks unevenly have unstable mind. The woman who wals like deer is slave or has to do labour work and woman who walks very fast is characterless. [N.S.S. 5/139]

Walking Patterns As Per Modern Medical Science

Following abnormal patterns of walking are noticed in diseased conditions :

Circumducted gait - Hemiplegia

Shuffling gait – Parkinsonism

Limping gait – Sciatica

Duck gait – Pseudo muscular hypertrophy

Frog gait – Pseudo muscular hypertrophy

Camel gait – Neuro scapulohumoral atrophy

Stamping gait – Foot drop

OBSERVATIONS

Sr.	Walking Pattern	Socio Economic Status	Health Impact
1	Slow and stable walking pattern [Stimit Gati]	Rich	Healthy
2	fast walking [Chapal Gati]	Alternately happy and unhappy	Alternately Healthy
3	Crisscross/zigzag pattern of walking [Tiryak Gati]	Poor	Unhealthy
4	Like elephant, ox, lion, panther, swan	Happy like king.	Healthy
5	Unstable pattern of walking with audible sound of walking [Satat evam Shabdagamina]	Poor	Vataj Prakriti individuals
6	Stable pattern of walking which is barely audible [Vyawasthit Gati evam Shlishta Sandhi]	Rich	Kaphaj Prakriti individuals
7	Well organized pattern [Susamhit and Suvyawasthit]	Rich	Sarvasara & Satvasara Individuals
8	Like fox, camel, donkey, rabbit, frog or deer	Devoid of happiness and government service	Unhealthy
9	Like cow, ox, mongoose, lion, peacock, cat	Bestowed with luck	Healthy
10	Walking with knees rubbing each other	Poor	Unhealthy
11	Circumducted gait [Pakshaghataj Ardhachap Chankraman]	Poor to medium	Hemiplegia
12	Shuffling gait (Laghu Krama Manda Vishama)	Poor to medium	Parkinsonism
13	Limping gait [Grudhrwat]	Poor to medium	Sciatica
14	Duck gait [Batakh Gati]	Poor	Pseudomuscular atrophy
15	Frog gait [Bheka Gati]	Poor	Pseudomuscular atrophy
16	Camel gait [Karabha Gati]	Poor	Neuro scapulohumoral atrophy
17	Reeling Gait [Bhramanwat]	Poor	Alcoholic intoxication
18	Spastic Springing Gait [Khanjaj Chankraman]	Poor	Lathirysm

DISCUSSION: To describe various distinct walking patterns, the ancient

acharyas as well as modern scholars have compared these patterns with the walking

style of various animals. The modern scholars have restricted these change in walking style up to disease condition only whereas ancient acharyas have broadened the area of research and they have implicated the role of the walking patterns not only in assessment of health and disease but also in the assessment of socio economic status.

Persons who walks like cow, ox, mongoose, lion, peacock, cat are considered to be lucky. All these animal walk represents a 'cat walk' style of walking.

Persons who walks like camel, donkey, rabbit, deer frog, owl, wolf, fox, lizard, monkey are considered to be unlucky and has to suffer a lot. The fox walk is little faster than normal walk and generally involves the border of the sole hitting the ground first.

The poor and rich criteria and similarly healthy and unhealthy criteria is decided on the fact that persons with abnormal walking will not perform better in life as compared to persons having normal walk. Abnormal walking have restriction of work and many actions. Also it has the attached social stigma. They are considered inferior. Their mental framework also gets altered and they face depression and fail on many fronts of life.

The ancient and modern abnormal walking pattern can be correlated as follows :

a) पक्षाघातज चंकमण (Hemiplegic / Spastic / Circumducting Gait)

▪ Because of paralysis of one half of the body active forward projection of paralysed limb is difficult and patient tends to fall on the ground (*Sharir Ardham Akarmanyam Patati Asun* [S.Ni.

1/62]). The ball of great toe rubs against the ground. Paralysed arm is adducted flexed at elbow. Fingers, wrist and the forearm is pronated. Foot often inverted and planter flexed.

b) गृध्रवत चंकमण (Limping Gait)

▪ Walks like vulture (*Grudhra vat*). i.e. patient limps with short steps keeping the painful limb semifused and dropping the pelvis towards painful side it occurs in disease *Grudhrasi* (*Sciatica*).[C.Chi.28/56]. It is also noticed in the disease *Khanja* (*monoplegia of leg*).

c) भ्रमणवत चंकमण (Reeling Gait)

▪ In severe vertigo, diplopia and alcoholic intoxication there is marked unsteadiness. Particularly on turning. [M.N.17/19-1]

d) जरा शोषी चंकमण (Senile Gait)

▪ Short, shuffling steps with tremors. [M.N. 10/16-17]

e) कलायखंजज चंकमण (Spastic Springing Gait)

कम्पते गमन आरम्भे खंजन इव च याति। कलायखंज ताम् विद्यात् मुक्त सन्धि प्रबन्धनम्। (अ.सं.नि. 15/46)

▪ In lathyrism, patient limps and springs while walking (*Prakraman Vepate Khanj Eva Gachhati* [S.Ni.1/78]). At first the patient walks on tip toe. The body is raised high before toes leave the ground giving rise to up and down movements of the shoulder. Tilting of pelvis and circumduction of legs occurs. The legs are crossed scissorwise. Later patient uses one or two sticks to walk.

f) लघुकम मन्दा विषमा गतिः (Shuffling / Festinant Gait)

● ह्रस्व प्लुता अनुविध्दा लसत्पदाभ्यान्तरबला बाहया।

स्तब्धा मन्दा विषमा लघुकम अशोभना न गतिः। नृ.सा.शा. 5/138

The woman who walks in short steps initially and then in long steps with pauses with rubbing of legs internally or bends externally has a abnormal gait. Also who walks slowly with pauses, irregularly in short steps has abnormal gait. [N.S.S. 5/138]

● विषमा विकटा मन्दा लघुकमा चंचला द्रुता स्तब्धा गतिः न शुभा ॥ नृ.सा.शा. 3/17

The males having irregular, unpleasant, slow, short unstable steps with pauses walking pattern is inauspicious and abnormal. [N.S.S. 3/17]

■ **As per modern science**, the patient bent forwards (flexion dystonia) and advances with rapid short shuffling steps due to rigidity. Turning occurs without lifting the leg. No arm swinging while walking. It is commonly seen in parkinsonism.

g) Waddling / Duck Gait

■ Walking like duck. The pelvis is rotated through an abnormally large arc with compensatory lardosis. The heels and toe tend to be brought down simultaneously. It is seen in pseudomuscular hypertrophic dystrophies.

h) भेकगति (Frog Gait)

● भेक येषां गति समाना ते गतसुखराजसन्मानः ॥ नृ.सा.शा. 3/16

The males having walking pattern like frog are devoid of happiness. [N.S.S. 3/16]

■ **As per modern science**, In later stages of muscular dystrophy when the power to stand erect is lost, patient crawls on hands and toes.

i) करभगति (Camel Gait)

● करभ येषां गति समाना ते गतसुखराजसन्मानः ॥ नृ.सा.शा. 3/16

The males having walking pattern like camel is devoid of happiness. [N.S.S. 3/16]

■ **As per modern science**, In fascio-scapulo-humeral dystrophy, protrusion of buttocks appears like back of camel.

j) Unilateral High Stepping Gait

■ Hip and knee lifted too high to clear the drop foot from the ground and brought loosely down. It occurs in flaccid paralysis of external popliteal nerve. Bilateral High Stepping Gait can occur in polyneuritis, muscular dystrophies

k) Stamping Gait (Sensory ataxia)

■ Patient walks on a broad base. Lifts the leg high violently and then brings it down forcibly stamping the heels on the ground. It is seen in tabes dorsalis, carcinomatous neuromyopathy.

l) Hysterical Gait

■ A bizarre gait not resembling any known pattern of organic disease. Absence of neurological signs.

m) Frontal lobe Gait

■ Wide base gait. Initiation of walking is difficult. Feet seems to stick to the floor. Tendency to fall backward. It is due to disturbance of connection between frontal cortex, basal ganglia and cerebellum.

n) Ataxic gait/ Reeling Gait :

The ataxia refers to unsteadiness. The gait of cerebellar ataxia appears like reeling or drunken. Patient walks on broad base irregularly. It is of following types:

a) Cerebellar ataxia – Encephalitis, Tumour, degeneration, parietal lesion, vascular, alcohol.

b) Sensory ataxia – Peripheral neuritis, parietal lesion, spinal cord lesion, tabes dorsalis.

c) Central ataxia – Vascular lesion in medulla affecting vestibular nucleus.

d) Labyrinthine –Labyrinthitis, Menier's disease, streptomycin induced.

0) आभ्यान्तर संलग्नपद / तिर्यकगतयः (Scissor Gait) :

• आभ्यान्तरा अथ बाह्या संलग्नपदा वा गतिः न शुभा। नृ.सा.शा. 3/17

• तिर्यकगतयः तु अधन्याः। का.सू. लक्षणाध्याय 28

A person who walks in crisscross fashion or with his knees rubbing each other internally is unhealthy and poor.

It is a form of gait abnormality primarily associated with spastic cerebral palsy in which there is hypertonia in the legs, hips and pelvis as a result these areas become flexed to various degrees, giving the appearance of crouching, while tight adductors produce extreme adduction, presented by knees and thighs hitting, or sometimes even crossing, in a scissors-like movement while the opposing muscles, the abductors, become comparatively weak from lack of use.

RESULTS

1. Persons with slow and stable walking pattern [*Stimit Gati*] are rich and healthy
2. Persons with fast walking [*Chapal Gati*] are alternately happy and unhappy.
3. Persons with Crisscross pattern of walking [*Tiryak Gati*] are poor and unhealthy.
4. Persons who walk like elephant, ox, lion, panther are happy like king and Healthy.
5. Persons with unstable pattern of walking and with audible sound of walking [*Satat evam Shabdagamina*] are poor and generally are Vataj Prakriti individuals.

6. Persons with stable pattern of walking which is barely audible [*Vyawasthit Gati evam Shlishta Sandhi*] are rich and generally are Kaphaj Prakriti individuals.
7. Persons with well organized pattern [*Susamhit and Suvyawasthit*] are rich generally are Sarvasara & Satvasara individuals.
8. Persons who Walk Like fox, camel, donkey, rabbit, frog or deer are devoid of happiness and government service and unhealthy.
9. Persons walking like cow, ox, mongoose, lion, peacock, cat are Bestowed with luck and Healthy.
10. Persons walking with knees rubbing each other are poor and unhealthy.
11. Persons with Circumducted gait [*Pakshaghataj Ardhashap Chankraman*] is found in hemiplegia .
12. Persons with Shuffling gait [*Laghu Krama Manda Vishama*] is found in Parkinsonism
13. Persons with Limping gait [*Grudhrwat*] is found in Sciatica.
14. Persons with Duck gait [*Batakh Gati*] is found in Pseudomuscular atrophy
15. Persons with Frog gait [*Bheka Gati*] is found in Pseudomuscular atrophy
16. Persons with Camel gait [*Karabha Gati*] is found in Neuro scapulohumoral atrophy
17. Persons with Reeling Gait [*Bhramanwat*] is observed in Alcoholic intoxication
18. Persons with Spastic Springing Gait [*Khanjaj Chankraman*] is found in Lathyrism

19. Persons with Scissor Gait [Tiryak Gati] is found in spastic cerebral palsy.

CONCLUSION

1. The critical comparison of Ayurvedic and Jyotish shastrokta, Gati characteristics, shows marked similarities between them.
2. The Gati characteristics can be used as a parameter for predicting health and socio economic status.
3. Some of the Gati characteristics are exclusively mentioned in Jyotish science only. Hence, those should be incorporated in Ayurveda to enrich the science.
4. The Ayurvedokta and Jyotish shastrokta Gati (Gait) characteristics could also be studied in modern perspective and their role in disease identification needs to be explored on broader scale with the help of modern science.
5. The persons having normal well organized walking pattern are immune to the diseases and have good health and fortune.

ABBREVIATIONS

1. C.Vi- Charak Vimansthana,
2. S.Su. – Sushrut Sutrasthana,
3. B.S. – Brihat Samhita,
4. N.S.Sha. – Nrusti Samudrik

Shastra

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Subhash D. Waghe, Y.V. Rajyalakshmi Rao, Kavita Agrawal

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