

Human Hibernation and *Samadhi Nilai* of *Cittar Attanga Yogam* – A Literature Review

Harihara Mahadevan M*, Vanmathi KP, Eswaran C

Siddha Clinical Research Unit (Central Council for Research in India), Sri Jayachamarejendra Govt. Ayurvedic Hospital Campus, Dhanvantri Road, Bengaluru 560009, India.

*Correspondence: drharihara@gmail.com

ABSTRACT

Attangayogam explained in *Gnana noolgal* (Philosophical texts) of *Cittarkal* are unexplored by scientific community as there is a common opinion that they deal only with spirituality and philosophy. The basic philosophy behind Siddha medicine and Siddha pharmacological preparations roots from the philosophies mentioned in *Gnana noolgal*. As these philosophies were framed by observing nature and interpretation of science behind the natural phenomenon. Immortality and longevity were the main goals of *Cittarkal* in their way to achieve the aim of *Attama Citti*. *Gnana noolgal* discuss in detail about the *Attanga Yogam* practices which are the main tools to attain immortality. The *Samadhi nilai* mentioned in *Cittar* texts (*Gnana noolgal*) mimics hibernation of mammals. This review focuses on comparing '*Samadhi Nilai*' of *Attangayogam* with hibernation of mammals.

KEYWORDS *Attamacitti*, Hypometabolism, Immortality, *Siddha*, Torpor

1. INTRODUCTION

'*Cittarkal*' are considered to be the group of scholars who had attained the stage of '*Citti*'. '*Citti*' is eternal spiritual perfection attained by *Attanga Yogam*. '*Cittarkal*' considered that emotional, spiritual and physical fitness is the preliminary factors necessary to attain '*Citti*' and this could be obtained by practising '*Attanga Yogam*'. Of the eight stages of *Attanga Yogam*, '*Samadhi Nilai*' is considered to be final stage in which the body enters a hypometabolic state or dormant state of body's physiological functions. If we analyse the symptoms experienced by human body during '*Samadhi nilai*' mentioned in *Cittar* text^[1] with the hibernation pattern of mammals as explained in research articles^[2], We can observe that '*Samadhi nilai*' mimics hibernation of mammals. Nowadays, many researches are being conducted to understand the physiology of hibernation in mammals and

induction of hypometabolism of cells and organs in the non-hibernating animals including humans with the aim of exploring new treatment options for ischemic conditions such as stroke and also to understand the factors responsible for delayed ageing process in hibernating animals and the induction of hibernation in humans to increase human lifespan^[3].

2. CITTARKAL AND IMMORTALITY

'*Cittarkal*' considered physical wellbeing as basic requirement for practising '*Attanga Yogam*' and Immortality was considered as the aim without which eternal perfection called '*Citti*' is not possible.

Cittar Thirumoolar in his '*Thirumanthiram*' had explained that,

'Uṭampāl Azivar Uyirāl Azivar

Tirampāṭa Meññāṇam Cēravum Māṭṭar

Uṭampai Vaḷarkkum Upāyam Aṟintē
Uṭampai Vaḷarttēṅ Uyir Vaḷarttēṅ^[4]

This can be translated as, 'the soul that rests in mortal human body could not attain spiritual wisdom as the fate of the soul ends with the demise of human body. So, the wellbeing of the soul relies on the status of human body. By attaining physical wellbeing, my soul has attained its state of wellbeing'.

Ramalinga adigalar, a saint who had analysed the principles of *Cittarkal* had declared that, '*Maranamillaperuvazhvuvazhnthidalamkandeer*, *Punainhthuraiyen poi pugalensathiyamsolkindren*' which could be translated that; 'We can lead an immortal life. I've not fabricated anything or lying. It is a truth.'

3. ATTANGA YOGAM

The term 'Yogam' is derived from Tamil word, 'Okam = O + Am'. According to TV Sambasivampillai's Siddha Medical dictionary, the Tamil word O = *Punarchi*^[5] which could be translated as 'Copulation' and 'Am' is the suffix used for a verbal noun in Tamil grammar. So, the root word of 'Yogam' is 'Okam' which means 'to mingle with' or 'to couple with'. *Yogam* was followed by '*Cittarkal*' as a tool to mingle with God. There are eight stages of *Attangayogam*. Successful practice and performance of *Attangayogam* will lead to '*Citti Nilai*'. '*Citti Nilai*' is classified into eight and termed as '*Attamacitti*'^[4]. Those who had achieved '*Attamacitti*' were called as '*Cittarkal*'. '*Cittarkal*' had explained in detail about '*Attanga Yogam*', their classification and instructions to be followed while performing '*Attanga Yogam*'.

Classical *Siddha* text, '*Thirumanthiram*' classifies the eight stages of *Attanga Yogam* as 1. *Iyamam* 2. *Niyamam* 3. *Asanam* 4. *Pranayamam* 5. *Prathyakaram* 6. *Dharanai* 7. *Dhyanam* 8. *Samadhi Iyamam* is the art of

maintaining mental purity, *Niyamam* can be explained as following clean habits and maintaining personal hygiene, *Asanam* is practising specific body postures along with mental concentration, *Pranayamam* is observation of breathing and maintenance of breath by constant phase of inhalation, exhalation and resting of breath within the body. *Prathyakaram* is abstraction and withdrawal of senses, *Dharanai* is the concentration of mind. *Dhyanam* is focusing and concentrating on a particular thing. *Samadhi* is attaining the stage of eternal spiritual perfection.^[4]

The eight *cittis* that can be achieved by performing *Attanga Yogam* are classified as,

1. *Anima*
2. *Mahima*
3. *Lahima*
4. *Karima*
5. *Prapthi*
6. *Prakamiyamam*
7. *Vasithuvam*
8. *Easathuvam*.

4. SAMADHI NILAI

Samadhi Nilai is the eighth stage of *Attangayogam*.

Thirumoolar explains '*Samadhi*' as,

CamātiYāmatilYārCella Kūṭum
CamātiYāmatil Tāneṭṭu Citti
CamātiYāmatilTainkiṇōrk Kaṇṇē
CamātiYāmatilTalaippaṭum Tāne^[4].

This can be translated as, 'on entering the stage of *Samadhinilai* one can attain *Attamacittior* eight supernatural powers.

Siddha text '*Agathiyarvathasowmiyam*'^[6] and '*Agathiyar Paripooranam 1200*'^[7] classifies *Samadhi* into five sub stages. They are

1. *Thathvalaya samadhi*
2. *Savikarpa samadhi*
3. *Niruvikarpa samadhi*
4. *Sanchara samadhi*
5. *Aaruda samadhi*.

4.1 HIBERNATION AND SAMADHI NILAI

Siddha text '*Agathiyaryemathathuvamennumpanchakaaviy*

anigandu' explains the symptoms that appear in human body on attaining *Samadhi yogamas*,

'*ParivākaCaṭalamelām Kuḷirccipōl Kāṇum*
Ākkiyē Intappaṭi MaṇṭalamIrupōtu
Vaḷamāka Koṇṭiṭavē Vāyuvai Kaṭṭumpārē
Pārappā Cuntaramē Vāciyellām Kōṭi
Paṇpuperum Cikāravītu PiṭamatiOṭuṅkum
Ārappā Camātiyōkam Ārariyapōrār
Arintavartān Cākātakālai Arintiruppār
-AkattiyarĒmaTattuvam Eṇṇum PañcaKāviya
Nikaṇṭu^[1]

This can be translated as, 'During the stage of *Samadhiyogam*, body temperature decreases below the normal body temperature. *Vaasi* (Breathing or Respiration) becomes stagnant in human body and those who know *Samadhi yogam* will know about (*Saagathakaal*) that is the art of breathing that maintains immortality.

'Samadhi Nilai' as explained above is similar to hibernation. Animals that live in extreme weather conditions enter into a hypometabolic state that can be classified as hibernation and torpor. During hibernation animals maintain reduced metabolic rate and reduced body temperature by voluntarily entering into a stage of dormancy or deep sleep over prolonged period of time. Torpor animals involuntarily enters the stage of dormancy or deep sleep for a short duration of time during extreme weather conditions in winter^[8,9].

Cittarkal framed Siddha medical science by observing natural phenomenon and behaviours of animals in nature. *Sattamuni* explains the philosophical background of human physiology as, "*Andathilullathepindam, Pindathilullatheandam*". This can be translated as, 'What is in the universe is in body and what is in the body is in universe'. So, the universe and human body are interrelated to each other.

The observation of *Cittarkal* on animal behaviour can be revealed by their briefing on *Naadi* pattern. *Vaathanaadi* is compared with

the gait of Hen, Swan, Peacock, Chameleon, Nightingale and Stork or Crane. The gait of Tortoise, Leech is compared with *Pithanaadi* and the movement of reptiles and frog are compared with the *Aiyanaadi* pattern^[10].

Studies on Observation of the physiology of hibernation in mammals reveals that metabolism of the body during hibernation is severely depressed with decrease in body temperature. In hibernating arctic ground squirrels, body temperatures decrease as low as -2.9⁰ C. Metabolic rate of hibernating animals is 1/30 to 1/100 of resting metabolic rate, consequently heart rate is remarkably low. In hibernating bears the heart rate is down regulated with low respiratory rate^[11].

The physiological changes observed in hibernating animals by various scientific studies mimic the symptoms that appear during '*Samadhi yogam*' as explained by '*Agathiyaryemathathuvamennumpanjakaviyandi gandu*'^[11].

5. HIBERNATION AND LIFESPAN OF MAMMALS

Telomeres which are the endcaps of chromosomes decrease in their length with ageing. As the telomeres are decreased in length with every mitotic cell division of somatic cells, there is a reciprocal relationship between longevity and telomere length. It has been observed that hibernating animals live longer than the non-hibernators of same weight. Scientific researchers have proved that telomeres are elongated in older individuals in hibernating edible dormouse, a rodent species^[12].

A Research was conducted to study about telomere dynamics and its relationship with survival and biological ageing of Djungarian hamsters (*Phodopus sungorus*) undergoing daily torpor. The results of the research proved that daily torpor is associated with physiological

changes that increases somatic maintenance and slows the process of ageing [13].

A study on Telomere dynamics in free living edible dormice (*Glis glis*) undergoing hibernation on extreme weather conditions concludes that in torpid state the mitosis is arrested, Relative Telomere length (RTL) is shortened during the period of arousal from torpor and the animals are able to elongate their telomeres during active season after hibernation when the food is available [14].

Krumen et al in their research on accumulation of intestinal epithelial cells throughout a bout of hibernation in hibernating ground squirrels (*Citellus undulates*) concluded that mitosis was arrested at low body temperature during hibernation in G2 stage of cell cycle [15].

The results of above-mentioned researches reveal that hibernation is associated with longevity with lengthening of telomeres in chromosomes. So, inducing hibernation in humans would help to improve the life span and prevention of diseases such as cancer that are caused by damage in the DNA sequence during mitosis.

Agathiyarsamathisoothiram 9 has mentioned the benefits caused while attaining 'Samathinilai'

'Pārē Camāti Pakarntiṭak Kēlu
Ārē Vipūti Ācaṇam Pōṭu
Nērē Ōrāṇṭu Nilaittu Camāti
Tērē Ezuntīṭu Tikaipparru Pōmē
Pōmē Naraitirai Pukalpaṭa Nōyaṇum
Tāmē Tēkam Taḷir Nīram Ōtiṭum
Tēmē Tēkam Tikazntiṭum Patiṇārāy
Ōmē Vāciyen Ruṇṇiṭa Nirkumē' [16]

After the arousal from 'Samadhi nilai' after a span of one year, one could retain the vigour and vitality of body and *Vaasi* (Breath) becomes stagnant inside the body during 'Samadhi nilai'.

The 'Samadhi nilai' as mentioned above could be compared with hibernation for one year and arousal from the hypometabolic state after a period of one year.

'Samadhi nilai' of 'Cittarkal' can be compared with the elongation of life span by inducing hibernation. Hence, inducing hibernation in humans can be achieved through *Attangayogam* practices.

6. DISCUSSION

Lifespan of hibernating animals are longer than the lifespan of non-hibernating animals of same weight. Apart from the fact that hibernation, quarantines these animals from predators, arrests mitosis of somatic cells in low body temperature of torpid state during hibernation, elongation of telomeres occurs during the active phase of hibernation, these are found to be the main causes of the increased lifespan. *Attangayogam* as explained by 'Cittarkal' mimics the hibernation of animals during extreme weather conditions.

Only limited number of studies has been conducted to study about impact of *Attangayogam* practices on telomeres [17,18]. A systematic review on Implication of *Asanam*, *Pranayamam*, meditation on telomere stability has concluded that positive effects were observed in the scientific studies conducted to study the yoga intervention on telomere length [19].

Siddha texts have discussed in detail about all the eight stages of *Attangayogam*. *Bogar 7000* had classified all the eight stages of *Attangayogam* into various sub-stages. Accordingly, the sub stages of *Attangayogam* are *Iyamam-10*, *Niyamam-10*, *Asanam-9*, *Pranayamam-5*, *Prathyakaram-6*, *Tharanai-6*, *Dhyanam-10*, *Samadhi-5* [20]. Various classical Siddha texts in Tamil language explain about the symptoms experienced by 'Cittarkal' while they had performed various *Attangayogam*

practices. 'Cittarkal' were considered to the group of scholars who had attained 'Attamacitti', the ultimate goal of Attangayogam practice.

7. CONCLUSION

Siddha literatures written by 'Cittarkal' could be selected as reference material before conducting scientific researches on Attangayogam and scientific researches aimed to induce hibernation in mammals.

ACKNOWLEDGEMENT

We hereby acknowledge Dr. P. Sathyarajeswaran, Assistant Director, SCRI, Chennai for the transliteration of *Cittar* texts mentioned in this article.

REFERENCES

- Ramachandran SP (Ed). Agathiyaryemathathuvamennumpanchakaviyani gandu (In Tamil), 3rded. Chennai: Thamarai Noolagam; 2016; p.212-13.
- Fisherman AP, Lyman CP. Circulation 1961;24(2):434-45.
- Lee CC. Is human hibernation possible? Annu Rev Med 2008;59:177-86.
- Thirumanthiram (In Tamil). 1st Edition. White helmet Publications, Chennai; 2008; Kindle edition.
- Samabasivam PTV. Siddha Medical Dictionary Vol I Part II (Tamil and English), 1st Ed. 3rd Reprint. Chennai: Department of Indian medicine and Homeopathy; 2016; p.1601.
- Mohan RC (Ed). Agathiyar Vathasowmiyam, 3rd ed. Thamarainoolagam, Chennai; 2013; p.77-9.
- Ramachandran SP Editor. Agathiyar Paripoornam 1200 (In Tamil), 5th ed. Thamarai Noolagam, Chennai; 1997; p.284.
- Geiser F. Hibernation and daily torpor in Marsupials: A review. Aust J Zool 1994;42:1-16.
- <https://www.thoughtco.com/hibernation-and-torpor-whats-the-difference-1140760>.
- Shanmugavelu M. Principles of diagnosis in Siddha. 1st ed. Department of Indian medicine and Homeopathy, Chennai; 2009; p.148-9.
- Lyman CP, Chatfield PO. Physiology of hibernation in mammals. American journal of physiology 1995;(4):403-25.
- Hoelzl, F. et al. Telomeres are elongated in older individuals in a hibernating rodent, the edible dormouse (*Glis glis*). Sci Rep 2016;6:36856; doi: 10.1038/srep36856.
- Turbill C, Smith S, Deimel C, Ruf T. Daily torpor is associated with telomere length change over winter in Djungarian hamsters. Biol Lett 2012;8:304-7.
- Hoelzl F, Cornils JS, Smith S, Moodley Y, Ruf T. Telomere dynamics in free-living edible dormice (*Glis glis*): the impact of hibernation and food supply. J Exp Bio 2016;219:2469-74.
- Kruman II, Ilyasova EN, Rudchenko SA and Khurkhulu ZS. The intestinal epithelial cells of ground squirrel (*Citellus undulatus*) accumulate at G2 phase of the cell cycle throughout a bout of hibernation. Comp Biochem Physiol A Physiol 90:233-236.
- Mohan RC (Ed). Agathiyagnanaamutham (In Tamil). 3rd ed. Thamarainoolagam, Chennai; 2016: p.12.
- Kumar SB, Yadav R, Yadav RK, Tolahunase M, Dada R. Telomerase activity and cellular aging might be positively modified by a yoga-based lifestyle intervention. J Altern Complement Med 2015;21:370-2.
- Lavretsky H, Epel ES, Siddarth P, Nazarian N, Cyr NS, Khalsa DS, et al. A pilot study of yogic meditation for family dementia caregivers with depressive symptoms: Effects on mental health, cognition, and telomerase activity. Int J Geriatr Psychiatry 2013;28:57-65.
- Rathore M, Abraham J. Implication of asana, pranayama and meditation on telomere stability. Int J Yoga 2018;11:186-93.
- Mohan RC (Ed). Bogar7000, Vol -1 (In Tamil). Thamarainoolagam, Chennai; 2017; p.72-4.