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A REVIEW OF AYURVEDIC APPROACH TO DIAGNOSIS AND TREATMENT OF MUSCULO SKELETAL DISORDER OF HANDIGODU (HANDIGODU SYNDROME)

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ABSTRACT

The Handigodu syndrome which manifested itself in 1970s in Shivamogga and Chikamagalur districts of Karnataka is a special kind of musculo skeletal disorder. It has defied clear cut diagnosis and effective prevention and treatment. Although some recent studies have brought out the genetic basis of the syndrome, (which is categorized under skeletal dysplasia) analysis of this problem from the viewpoints of Ayurveda have not been made. This paper attempts to describe the syndrome and its diagnosis and possible line of treatment through Ayurveda. A brief survey of the studies made by expert institutions so far will be made. Based on diagnosis (Nidana) of a few cases, it will be examined whether it comes under Asthi dhatu kshaya mentioned in the Ayurvedic literature. Thereafter clinical diagnosis/description of the syndrome will be attempted. We will also examine the sadhyaasadhyata (possibility of curative treatment) of the disease. Whether and what type of treatment, even if it is experimental in nature can be adopted will also be examined.

Key Words: Handigodu Syndrome, musculo skeletal disorder, skeletal dysplasia, asthidhatu kshaya, endochondral ossification.

INTRODUCTION

Handigodu syndrome was reported in the late 1970s, predominantly in Handigodu village of Sagar taluk in Shivamogga district. Subsequently it was detected in Chikamagalur district also (**Annexure -1**). The syndrome had the following typical characteristics: a) Severe pain in joints like the knees and waist, b) Deformity in the bones, particularly in the legs, back and neck, c) Inability to move around, d) The people got affected usually in the adolescent years and did not live beyond six decades, e) forward pushing gait (crane like) using only the front foot,

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without using heels.

Though identified as an orthopedic problem, there were no known classification and treatment for this syndrome in modern medicine. Handigodu musculo skeletal disorder was added to the Indian orthopedic literature by Dr. S S Agarwal and Dr. S P S Teotia. Since it was prevalent only among the backward communities like Channangi **and** Cheluvadi, it was concluded that the syndrome could be hereditary. Simultaneously, it was also observed that

-2- about a third of the affected people of these communities were comparatively of lesser height and some of them dwarfs.

2. Studies: Some of the studies which were taken up to understand this syndrome are as follows:

a. The first epidemiological study (1977) of the problem by National Institute of Nutrition described it as endemic familial arthritis of Malnad. [1]

b. The study conducted by Indian Council for Medical Research (ICMR) (1994) identified the problem as dysplasia of the autosomal dominant type. [2]

c. During the second study of ICMR (2001) it was noticed that there are different phenotypes of musculo skeletal disorders. The first type was predominantly hip-joint deformity and pain. The second type was predominantly dysplastic. The third type was dwarfism. In some cases, osteoarthritis was also noticed. [3] **& 4**

d. The genetic study on Handigodu syndrome by Anthropology Survey of India (2012) led to the conclusion that, the deformities were probably due to inadequate generation of enzymes responsible for bone formation, which in turn was due to lesser number of genes in the particular community. Absence of polyhydroxylation was found to be responsible for malfunctioning of endochondral ossification, which led to irregular bone development. [5]

The above studies have confirmed the hereditary and genetic basis of the syndrome. The Legislature Committee of Karnataka (September 1997) gave certain recommendations regarding the rehabilitation of people affected by Handigodu Syndrome. The Government of Karnataka has been implementing a project in Sagara, which has got a well-equipped taluk hospital. Radiological facility for X-ray and detection, Physiotherapy unit for rehabilitation and free distribution of medicines have been provided under the project. A hostel for providing nutritious food to the children at Handigodu has been functioning well. A rehabilitation unit of handloom weaving was also setup. The free treatment provided through the project mainly consists of providing dichlofenac tablets as pain killer. Since many of the affected people are highly immobile, they are not able to avail medical facilities by visiting the taluk hospital.

3. The History. The areas affected by Handigodu syndrome are shown in (**Annexure -1**) 910 people were identified with the syndrome in 1997 (**Annexure -2**). The syndrome which had been virulent

-3- up to the 1990s reduced itself after 2000. During the second phase of the study of ICMR (2005), 508 affected people were enumerated. **Annexure -3** gives the village wise distribution of affected people in Sagara taluk. **Annexure – 4** gives the caste wise information/distribution of the communities which were affected by the syndrome.

Between 2005-13, about 130 of them had expired. During the last decade, no new cases have been registered in Govt Taluk

Hospital. However, during the survey conducted by Karuna Trust in 2014, 42 suspected / new cases were noticed. These are yet to be certified.

Shri H M Chandrashekhara, social worker of Handigodu has devoted himself to the study, reporting and relief activities to the affected people since 1974 -75. Because of his untiring efforts the disease was taken up seriously by the Government of Karnataka and the ICMR. The first expert team which went into the study of the disease was led by Dr. K.S. Mani, Neurologist from National Institute of Mental Health and Neurosciences (NIMHANS), Bangalore. The team attributed the cause of pain to bone and joint disorders. The study of National Institute of Nutrition, Hyderabad reported that it was non-contagious, non-infectious and that it was not due to inadequacy of nutrition. The possibility of pesticide affected crab meat causing such problem was ruled out. The study of ICMR was conducted by Dr. S S Agarwal, Dr. S P S Teotia, Dr. Taranath Shetty and others. Most of the studies went into the nature and cause of the problem, which were unclear; therefore, they could not address the solution/treatment and prevention.

Shri Chandrashekhara who has knowledge of ethno-medicine and who assisted the experts in all the above mentioned scientific studies has maintained pedigree charts, tracing the family history of majority of the affected persons. According to him, the spell of severe cold winds in 1973-76 could have aggravated the expression of this problem, in view of living conditions and environment of the concerned villages. He has also hypothesized that this could be a type of '*sheetanga vayu sanni'* which is not unknown to Ayurveda vaidyas. However, this hypothesis needs further investigation.

Shri G.N. Hegde of Atomic Minerals Division, Bangalore visited Handigodu and carried out a study to ascertain the level of natural radiation to rule out the possibility of the deformities being influenced by radiation. Handigodu village is located at Longitude: 14^0 12' 56.7" and latitude: 75^0 02' 31.6" and mean sea level of 601 meters. The radiation level measured on 08.02.2012 by Atomex-AT6130 instrument at ground level recorded the value of 0.61mSv/yr. This is about 4 times less than the universal average background radiation level of 2.4mSv/yr. Since the radiation level is far below than the average levels, the possibility of radiation being the cause of deformities is ruled out.

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4. Project for pain management and relief through Ayurveda

The Karuna Trust (Bangalore) and the Handigodu Welfare Society took up a project for study and treatment of this syndrome in October, 2013 with the following objectives :

i. Early diagnosis, radiological examination, registration and management of Handigodu Syndrome affected people in their own villages and homes through Ayurvedic treatment.
ii. Facilitating / rehabilitation of affected people to get identity cards from State govt for getting their entitlements like allowance for the physically handicapped.
iii. To facilitate scientific research on the disease in collaboration with other institutions.

This project was funded by Nuclear Power Corporation, Kaiga and implemented under their guidance. The Ayurveda Mahavidyalaya of Hubli coordinated and guided the methods of diagnosis and treatment. The first inference based on observation

of the pedigree charts maintained for the known cases and the application of the means of diagnosis is that it is a *'kulaja vikaara / kulaja vyaadhi / sahaja roga'* (inherited disease). In specific terms, it can be characterized as *asthi pradoshaja vikaara,* caused by *asthi dhatu agni mandya (physiological processes involved in the formation of bones).*

5. Diagnosis (*Nidana*)

Being inheritance based disease, Handigodu musculo skeletal disorder is attributable to: a) *Beeja dosha* (defects caused by genes transmitted through marriage) b) *Dhatu Kshaya* (Physiological processes leading to deterioration of bones).

The symptoms of the syndrome like pain (*shoola),* fever *(jwara)* and multiple joint pain (*sandhi shoola*) lead us to the inference that *asthi* (bone), *sandhi* (joint) and *snayu* (muscle) are affected. Therefore, it may be identified as '*Asthi dhatu kshaya*' (Ref: Sushruta Samhita – 17/13) with the symptoms of '*Sandhishaithilya*' (weak/loose joints) and *asthitoda* (pain in the bones). The predominant *dosha* can be identified as *vaata* due to *Kshaya of asthi dhatu. Vata prakopa lakshanas* (symptoms of aggravated vata) are seen. The variants in musculo skeletal disorders can be covered under *ama vata* (Rhumotoid Arthritis) or *vata rakta* (Gouty Arthritis). The majority of the cases can be categorized as *sandhigata vata* (Osteo Arthritis) caused by *vata dosha.*

According to Charaka Samhita, *Sandhigatha vata* has symptoms like swelling of joints (*Shofa*), which on palpation resembles an air filled bladder (*vatapurna drutisparsha*) with painful and restricted movements (*Sandhishoola, Prasarana akunchanayoho apravruttih*). (Ref. Chapter 28/37).

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***6. Sadhyasadhyata* (possibility of treatment)**

Handigodu syndrome involves *Madhyama roga marga, asthisandhi and Upadhatusnayu.* Therefore, the prognosis lies between *Kashtasadhya, yapya* and *asadhya*. Some of the patients had *Rasa dhathukshaya and Raktha dhathukshaya.*

'Anuvamshika' nature of the disease indicates that there can be no preventive and curable means. Marriage/genetic counseling is one of the possibilities, to a limited extent. Given the social customs and practices of the people such counseling cannot be easily provided and practised. In the absence of curative therapy, palliative treatment for management of the symptoms may have to be followed.

7. Plan of treatment: The recommended treatment comprised of the following:

a) Counseling regarding living habits, food, exercise and physiotherapy.
b) Use of *Deepana* and *Pachana* drugs intended to target and treat *Kostagni* and *Saamadosa.*
c) Formulations/drugs intended to target and treat *Asthi dhathugata vikriti.*
d) Formulations intended to target *Sandhishoola, Parvashoola, Parvabheda, Sthanikashopha.*
e) Anupana.
f) *Taila abhyanga* (Oil massage) over the specific location and whole body.

The prescriptions were designed according to the status or condition of the affected person based on a holistic assessment of the prevalent conditions. because while some of them may be amenable for a common category of therapeutic treatment, some of them may need individualized treatment in view of different

conditions. Depending on the extent of or absence of improvement the intervention was modified. The following table gives the summary of the treatment protocol :

Symptoms	*Taila* for *Swedana*	*Guggulu*	*Kashaya*
Pain in joints along with creaking sound and unbearable pain	*Ksheerabala Taila*	*Yogaraja Guggulu*	*Balarishta*
Pain associated with burning and pricking sensation	*Pinda Taila*	*Kaishoradi Guggulu*	*Manjishtadi kadha*
Pain in joint associated with stiffness and numbness	*Karpooradi Taila*	*Amruthadi Guggulu*	*Dashamoola arishta*

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CONCLUSION

Since the launching of the project about 300 persons have been taking Ayurvedic treatment. 48 suspected cases have been X-rayed, of which 42 have been tentatively diagnosed as new cases. 146 persons were given physically challenged person identify card by Government of Karnataka, which enabled them to get enhanced monthly allowance of Rs. 1,200 (in place of Rs.700 earlier). Recently, some of the patients were interviewed regarding their present status of health vis-à-vis the status of health when the treatment began. In the six sample cases to Taranabailu and Kanle it was observed that they have perceived general improvement of health condition, self-confidence and greater degree of mobility. Therefore, it was opined that the treatment has been useful in improvement of health and pain management. Based on our exposure to the problem the following suggestions are made : i) The medical anthropology division of Anthropological Survey of India (Mysore) and Karnataka Institute of DNA research (KIDNAR), Dharwad University may collaborate and carry forward the genetic study conducted by Dr. A. Chandrasekar and Dr. Venugopal . The DNA bank with Anthropological . Survey of India, Mysore can be approached by other researchers also. ii) ICMR may sponsor further studies through its genetics experts in SGPI – Lucknow .Institutions of medical education and research can conduct research under their programmes for Ph.D. iii) Institutions of Education and research in Ayurveda also may sponsor project work / field study and research. iv) A periodic survey of the anatomical proportions and physical characteristics of all school children may be conducted once in 3 years for early detection of abnormalities for facilitating preventive and corrective intervention.(v) For the baseline orthopedic survey of adults mobile digital X-ray unit may be deployed.

In view of the advantages of digital X-ray like (a) better picture quality (b) maneuvering for angular screening and viewing the digital image and (c) better diagnosis and convenience in storing, it is suggested that digital screening may be undertaken in all the cases. In new / suspected cases that will help better analysis and can also be useful in a few cases for orthopedic correction / surgery. In older cases it will enable a comparison with the previous X-ray record and help in diagnosis of deterioration, if any. These will lead to a better understanding of the issues.

Unique local health problems of this kind may not attract enough attention for research from the point of view of development of medicines, but such situations can definitely attract

socially responsible institutions to devote attention to remedial measures. Therefore, in spite of the long standing nature of the problem and ambiguity of diagnosis, there is optimism due to the patient- centric approach and scientific approach to the management of the syndrome.

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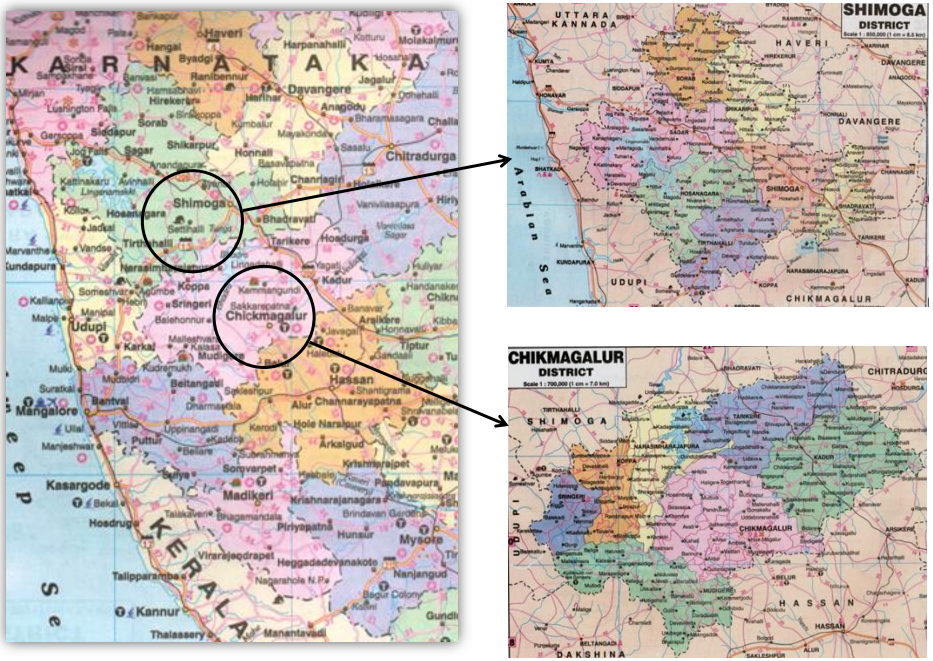
Annexure – 1 Areas affected By Handigodu Syndrome in Shivmoga and Chikmagalur Districts of Karnataka



Annexure – 2

Distribution of Handigodu patients (1997)

Shivmogga District					Chikmagalur District				
		No. of cases					No. of cases		
Name of the Taluk	No. of Village	Male	Female	Total	Name of the Taluk	No. of Village	Male	Female	Total
Sagar	46	154	230	384	Koppa	6	18	31	49
Sorab	4	13	27	40	Sringeri	2	10	14	14
Hosanagar	5	9	10	19	N. Pura	36	67	74	141
Thirtha halli	11	21	44	65	Chikmagalur	18	104	94	198
Bhadravathi	Nil	Nil	Nil	Nil					

Shivmogga	Nil	Nil	Nil	Nil					
TOTAL	**66**	**197**	**311**	**508**		**62**	**199**	**213**	**402**

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Annexure - 3

Village wise distribution of persons affected by Handigodu syndrome in Sagara taluk(2005)

Sl. No.	Name of Villages	Number of households	Total population	Number of population Adult Male	Adult Female	Children Male	Children Female	Total number of affected house holds	Number of affected persons	Number of affected persons Children Male	Children Female	Adult Male	Adult Female
1	Ambapura	16	74	11	11	28	24	8	18	-	-	9	9
2	Aramarekere	72	290	37	48	100	105	8	8	-	-	3	5
3	Balagodu	24	102	25	22	25	30	4	5	-	-	2	3
4	Bandagadde	56	193	39	26	60	68	22	32	1	1	13	17
5	Bedur	5	24	5	6	5	8	1	1	-	-	1	-
6	Beleyur	21	78	8	15	31	24	9	12	-	-	7	5
7	Belur	16	59	11	4	22	22	8	10	-	-	2	8
8	Beemanakone	14	62	17	7	16	22	2	2	-	-	1	1
9	Bommatte	15	67	9	11	27	20	4	5	-	-	2	3
10	Chekkabelagunji	32	145	18	29	47	51	7	16	-	-	9	7
11	Chipli	28	112	27	25	31	29	2	2	-	-	-	2
12	Daskoppa	47	190	31	32	67	60	6	6	-	1	2	3
13	Gaddemane	6	21	3	5	8	5	2	3	-	-	2	1
14	Ganganahonda	1	3	1		1	1	1	2	-	-	1	1
15	Geejagaru	16	71	13	7	21	30	1	1	-	-	-	1
16	Handigodu	43	123	31	17	31	44	22	40	2		15	23
17	Harokoppa	23	74	17	14	16	27	7	8	-	-	1	7
18	Hirethota	7	34		6	12	16	4	9	-	-	2	7
19	Hosarthe	30	99	22	19	29	29	5	5	-	-	1	4
20	K Kanugodu	10	35	3	6	15	11	3	4	-	-	2	2
21	Kagodudimba	20	63	14	13	16	20	3	3	-	-	3	-
22	Kalsipete	26	94	16	20	27	31	13	22	-	1	7	14
23	Kanale	76	272	41	38	95	98	9	11	-	-	4	7
24	Kanalepur	21	73	10	7	24	32	11	16	-	-	6	10
25	Kandika	13	63	10	13	19	21	1	1	-	-		1
26	Karehonda	104	480	76	64	162	178	18	19	-	-	6	13
Sl. No.	**Name of Villages**	**Number of households**	**Total population**	**Number of population Male**	**Female**	**Children Male**	**Adult Female**	**Total number of affected house holds**	**Number of affected persons**	**Number of affected persons Children Male**	**Female**	**Adult Male**	**Female**
27	Keladipura	35	126	17	28	34	47	10	18	-	-	10	8
28	Kelagiramane	9	46	12	8	12	14	2	2	-	-	2	-
29	Kerekoppa	7	40	4	8	12	16	2	4	-	-	3	1
30	Kolisalu	38	191	34	35	56	66	5	10	-	-	2	8

31	Kudigere	33	123	21	16	43	43	6	6	-	-	1	5
32	Lingadahalli	19	49	11	1	15	22	11	13	-	-	4	9
33	M Kanugodu	17	84	19	14	28	23	7	10	-	-	6	4
34	Malaliyur	24	106	19	20	27	40	6	9	-	-	2	7
35	Manehale	15	66	13	13	22	18	7	10	-	-	4	6
36	Mandagalale	14	63	9	17	18	19	5	6	2	-	1	3
37	Muntkodu	1	1			1		1	1	-	-	1	-
38	Murughamata	11	61	13	9	15	24	1	1	-	-	-	1
39	Neleguli	6	25	6	5	7	7	1	2	-	-	1	1
40	Othigodu	6	25	6	5	7	7	4	5	-	-	1	4
Total		**977**	**3907**	**679**	**644**	**1232**	**1352**	**249**	**358**	**5**	**3**	**139**	**211**

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Annexure – 4

Statement of population distribution of the castes affected by Handigodu syndrome in Sagara taluk (2005).

No. of Population	Chennangi	Cheluvadi	Vokkaligas
Male	71	48	23
Female	104	66	27
Total	**175**	**114**	**50**

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