Medical geography in Charaka Samhita

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Abstract

Charaka Samhita is the oldest and the most authentic treatise on Ayurveda and is the ancient medical science of India. Apart from giving information on medical conditions and their treatment; it also gives valuable information on geographical, social, and economic conditions of India. This article is an attempt to explore geographical conditions of the ancient India, its geographical position in present India and its medical significance.

Key words: Ayurveda, Charaka Samhita, Desha, geography, medical geography

Introduction

Desha is one of the factors which have to be assessed in ascertaining the Hetu (etiological factors) and also in deciding the treatment. Medical geography which is gaining significance in contemporary medicine has its origin from Hippocrates. Though the text gives a vast outline of geography in terms of Jangala, Aanoopta, and Sadharana; it also mentions about various places of the then India. Though attempts were made in past to compile and interpret the geographical aspects of Charaka Samhita,[1] this article attempts to analyze it from the perspective of medical geography.

Jangala Desha is predominant in Akasha Mahabhoota, and has vegetation that includes trees like Kadara (Acacia polyantha Willd.), Khadira (Aechiia catechu L.), Asana (Bridella retusa Spreng.), Ashwakarna (Dipterocarpus turbinatus Gaertn.), Dhava (Angicissus latifolia [Roxb. ex DC.] Wall. ex Guil. and Perr.), Trinisha (Ougenia dalbergodees Linn.), Shallakki (Boswellia serrata Triana and Planch.), Saada (Shorea robusta Roth), Badari (Ziziphus mauritiana Lam.), Tinduka (Diospyros melanoxylon Roxb.), Ashwatha (Ficus religiosa L.), Vata (Ficus bengalensis L.), Amalaki (Phyllanthus emblica L.), Shami (Prosopis cineraria [L.] Duce), Kakubha (Terminalia arjuna [Roxb.] Wight and Arn.), Shimshapa (Dalbergia sissoo Roxb.) and birds include Lava, Tittira, Chakora, etc. The people here are generally strong. Aanoopta has a rich vegetation of trees like Hintala (Phoenix paludosa Roxb.), Yamaala (Garcinia Morella Gaertn), Narikela (Cocus nucifera L.), Kudali (Musa paradisica L.), and various angiosperms. It is rich in water bodies like lakes and ponds and birds include Hamsa, Chakravaka, Balaka, Nandimukha, Pandareeka, Kadamba, Bhringaraja, and Kokila. The people here enjoy the cool breeze and are delicate with Vatakapha dominance. Sadharana is the admixture of both the above.[2]

Historical Background

The presently available Charaka Samhita mentions Punarvasu Atreya, Charaka, and Dridhabala. Punarvasu Atreya is believed to have preached Ayurveda to his student Agnivesha, who composed the text which Charaka redacted and Dridhabala completed.

The period of Punarvasu Atreya is considered to be 1000 BC.[3] The royal physician of king Kanishka was Charaka. Hence, the period of Charaka may be taken as second century BC.[4] The period of Dridhabala is taken as 400 AD.[5]

Review of Literature

The Deshas mentioned in the treatise are classified under various headings. The descriptions are as follows.

The places of expounding of chapters

The chapter of Janapadoddhiwamsa Vimana Adhyaya (chapter on epidemics) was expounded on the banks of river Ganga, in the city Kambilya, located in the province of Panchala[6] whereas the chapters on treatment of Raktapitta (bleeding disorders) in the city of Panchaganga,[7] Udara (ascitis),[8] and Visarpa (herpes)[9] in the mountains of Kailasa. Atreya Bhradakapyeeya Adhyaya was discussed in the beautiful region of Chaitraraththa.[10] The chapter on treatment of Onivyapath (gynecological disorders)[11] and Bastisootriya[12] were expounded in the Himalaya.

Drugs indicating the regions of their origin

The nomenclature of drugs is sometimes done based on the
name of the place where it is found in abundance. Some of the examples are:

- **Magadhi** (Piper longum L.)[13] - derived from Magadha
- **Kampiliaka** (Mullotus philippensis [Lam.] Muell. Arg.)[15] - derived from Kampilya
- **Vatsaka** (Holarrhena antidysenterica [Roth.] DC.;[15] derived from Vatsa
- **Yavanika** (Trachyspermum ammi Sprague)[16] - derived from Yavana
- **Ashmantaka** (Bauhinia racemosa Lam.)[17] - derived from Ashmaka
- **Badara** (Ziziphus mauritiana Lam.)[18] - derived from Badari
- **Kashmraya** (Myrica nagi Thunb.)[19] - derived from Kashmir
- **Sourashtri** (alum)[20] - derived from Sourashtra

**Drugs popular in respective regions**

Chakrapani, the commentator of Charaka Samhita mentions certain drugs as popular in specific places. Peelu (Salvadora persica L.),(22) Abhishhukha (Pistacia vera L.),[23] Aaruka (Prunus domestica L.), Nikoekha (Alangium lamarkii L.),[24] Aakshoda (Juglans regia L.), Vatama (Prunus amygdalus Batsch.),[25] Munjaataka (Eulophia campestris Rchb.),[26] Picchuka Mani,[27] Bhavya (Dillenia indica L.),[28] and Lelitaka (Amalasara Gandhaka)[29] are popular in Uttarapatha while Kanhecha Gairika[30] and Vaarkhaka[31] are popular in Dakshina Desha. Amlika (Tamarindus indica L.)[32] and Paravata[31] are popular in Kamaroopta whereas Aaruka (Prunus domestica L.)[33] and the animal Shwadanshtra[34] in Kartikeapura. Tank[35] and the animal Sharabha (eight-legged deer)[36] are said to be famous in Kashmira and Kumkuma[37] in Bahlika. Magadha was famous for Maha Shal[38] and Priyala (Buchanania latifolia Roxb.).[39] Himalaya is considered as the habitat of Brahmasvarchala, Aindr[31] and other divine plants[38] and of the animal Rama (Himalayan buckbeak).[35]

**Drugs having different names in different regions**

Shakunabhota was famous as Vaka in Shravasti and Avanti, but in Magadh it was called as Pashaka. It was taken by swans to Uttarapatha.[35] The rice, Shvetashabha was called as Pundariika Shal in Magadh.[37] Yava was considered as Sampishita in Gandhara and in rest of the country as Yavachipita.[38] Shivira was considered as Siddhaka in Teerabhukta region of Videha.[39] Kulnasha was prepared by steaming the Yavapishita in rest of the country, but in Pariyatra region, it was prepared by steaming the Mudga and Masoora.[39]

**Places in relation to physicians**

The text mentions about the conduct of symposiums and the presence of delegates from various places like Kankayana, the physician from Bahlika,[40] and Kashapati Vanaka, the king of Varanasi.[41]

**Context of Satmya**

Different regions have different food habits. The text mentions few regions of India habituated with unique food practices. People who live in Bahlika, Pahlava, Cheena, Shoolika, Yavana, Shaka were Satmya to Mamsa (meat), Godhuma (wheat), Madhvika, Shastr, and Vaishvanara (strong to undergo surgeries and Agnikarma) while people of Prachya to Matsya (fish). Those living in Sindhu Desha were habituated to milk and people of Ashmaka and Avantika to oily and sour food. The people of Dakshina Desha had Peya Satmya whereas those of Uttara and Pashchima had Mantha Satmya. Residents of Madhya Desha were habituated to barley, wheat and milk products.[42]

**Regions indicating the place of authors**

Punarvasu Atreya hailed from the region on the banks of river Chandrabadha,[43] whereas the Pancnanadapura was the native of Dridhabala.[44] The commentator Chakrapani belonged to Gouda Desha.[45]

**Context of Lavana**

Different types of salts are mentioned in the treatise depending on its place of procurement.

- **Sauvarchala** - obtained from the region of Sauvira
- **Saindhava** - obtained from the banks of river Sindhu
- **Poamshuja** - obtained from Poorna Samudra
- **Samudra** - from Dakshina Samudra[46]
- **Romaka** - procured from the banks of Ruma river.[47]

**Context of Atisvane**

Residents of Prachya and Cheena take more of Kshara (alkaline food) and are susceptible to blindness, impotency, immature greying of hairs, and baldness whereas those of Bahlika, Sourashtrika, Saindhava, and Sauvira consume more of Lavana (salty food) and are prone to immature greying of hairs, alopecia, and baldness.[48]

**Context of posology**

Two systems of measurements are considered viz. Kalinga and Magadh. Magadh is considered superior to Kalinga.[49]

**Context of Arishtas**

Seeing a person of Andhra or Dravida Desha is considered as bad omen.[50]

**Rivers mentioned in Charaka Samhita**

The following rivers are mentioned in various contexts in Charaka Samhita: Ganga,[51] Sindhu,[52] Chandrabhadha,[45] and Ruma.[46]

**Mountains mentioned in Charaka Samhita**

- Meru and Himalaya are mentioned as an example to illustrate Pritshaktwa[53]
- Punarvasu Atreya is compared to Meru Mountain of knowledge[54]
- Himalaya is the most referred mountains in the book. The first symposium of sages on diseases and the need to learn Ayurveda took place near Himalayas.[55] It is considered as the abode of medicinal plants[56] and the best place to collect divine medicines.[57] The fruits such as grapes and pomegranate are said to be sweet in Himalaya and those grown elsewhere are sour.[58]
- While describing about qualities of water from different water sources, Charaka mentions different mountain ranges and the quality of water from the rivers originating. The rivers of Himalayas are good for health, those originating from Malaya are similar to the divine nectar. The rivers flowing to the western sea are clear and conducive to health while those reaching eastern sea...
Bhavana and Shreevathsa: Medical geography in Charaka Samhita

The Places in the Present Day India

Uttarapatha

Initially the term Uttarapatha referred to the northern high road, the main trade route that followed along river Ganges, crossed the Indo-Gangetic watershed, and ran through the Punjab to Takshashila (Gandhara) and further to Zariaspa or Balkh (Bactria) in central Asia. Later Uttarapatha was the name lent to the vast expanse of the region which the northern high road traversed. It included the northern India, from Anga in the east to Gandhara in the northwest, from Himalaya in the north to Vindhyha in the south. The Uttarapatha division probably included the territories of greater Punjab, Sindhu, Souvira, Afghanistan, Kashmir, Bactria, and parts of central Asia. was the 667 miles in circuit, touched river Mahi on the west, that is, it comprises of whole of peninsular Gujarat from lesser Ran of Kutch to Khambay. Videha was Northern Bihar. Karthikeyapura is the present Tamil Nadu. Gouda is modern Bengal. Panchanadapura is greater Punjab. Kamaroopa includes modern Assam together with Kusa-Vihara and Bhutan. Panchala is modern Badaun, Farrukhabad, and the adjoining districts of Uttar Pradesh. Kalinga was 853 miles in circuit, united to the west by Andhra, and to the south by Dhanakakata, between Godavari and Indravati rivers. Gandhara is the present Peshawar district of Pakistan. Chandrabhaga is identified with river Chenab. Avanti include Malwa, Nimar, and part of Madhya Pradesh. Ashmaka lay on the banks of river Godavari between the rivers Godavari and Manjira. It corresponds to the districts Nizamabad and parts of Adilabad, Nanded, and Yavatmal in Andhra Pradesh and Maharashtra. Vatsa was located on the banks of river Jamuna. Its capital Katusambhi was located near modern Allahabad. Pahlavas ruled between Afghanistan, Punjab, and Sindh. Sravasti is to the north of the present city of Ayodhaya between Akoa and Balrampur. Magadha was 853 miles in circuit, bounded by Ganges on the north, the district of Bara on the west, Mongir on the west and Singhubhum on the south. Shoolika is identified with Kashgar area of China. [Figure 1].

Vadari / Sauvira

It comprises of the whole of southern Rajputana. The size of province was 1000 miles in circuit. Boundaries are Ajmer and Ranthambore to the north, Loni and Chambal to the east and to the north, and Malwa frontier to the south. [61]

Madhyadesha

Baudhdayana Dharmasutra mentions Madhyadesha as Aryavarta and defines it as the territory lying to the east of Adarshana (Vinashana where Sarasvati lost herself in the sands near Kurukshetra, Haryana) to the west of Kalakavana (probably Allahabad) to the south of Himavat and north of Pariyatra (western Vindhyas with Aravalli range). [62]

Bahlika

The Iron pillar of Delhi inscription by King Chandra (4 CE), make a mention of Bahlikas as people living on the west side of the Indus river (Sindhu). After crossing the seven mouths of the Indus, King Chandra is stated to have defeated the Bahlikas. [63]

Sindhu Desha

Sindhu was divided into four parts: Upper (with districts Gandhara, Kalian, Shikarpur and Larkana, west from Indus; and Sabzalkot and Khaipur east from Indus), middle (a small area: Basically modern Seewan, northern parts of Haidarabad, and Urmakot), lower (a delta area from Haidarabad to the sea) and Kacli (around the ancient holy city of Ketesar with its famous Siva temple). [64]

Dakshinapatha is the region of peninsular India lying to the south of the Vindhyas. Shakas extend from Pushkalavati on the west to Takshashila on the east on both sides of Indus. Uttarakuru lay to the north-west of Sinkiang province of China and parts of the Tian Shan. Yavanas extended between Hindu kush and the Indus. Kashmir was between Indus on the north to the salt range in the south, from Indus on the west to Ravi on the east. Saurashtra

Discussion

Health geography is the application of geographical information, perspectives, and methods to the study of health, disease, and health care. The study of health geography has been influenced by (re) positioning of medical geography within the field of social geography due a shift from a medical model to a social model in healthcare, which advocates for the redefinition of health and health care away from prevention and treatment of illness only to one of promoting well-being in general.

Health geographers are concerned with the prevalence of different diseases along a range of scales from the local to global, and inspect the natural world, in all of its complexity, for correlations between diseases and locations. This situates...
health geography alongside other geographical sub-disciplines that trace human-environment relations.

Health geographers use modern spatial analysis tools to map the diffusion of various diseases, as individuals spread them among themselves, and across wider spaces as they migrate. Health geographers also consider all types of spaces as presenting health risks, from natural disasters, to interpersonal violence, stress, and other potential dangers.\(^{[85]}\)

Some of the diseases are absent completely in few countries like Rabies in Australia and New Zealand.\(^{[86]}\) Malaria is prevalent in tropical and subtropical regions.\(^{[87]}\)

**Concept of Jangala, Aanoopa and Sadharana**

Indian climate varies from region to region. Based on the amount of annual rainfall, annual range of temperature, different climatic regions are identified in the country. Most acceptable classification is given by the famous geographer, Trewartha [Table 1].\(^{[88]}\)

Though on a broader account this regional classification can be made for Jaangala, Aanoopa, and Sadharana, the climate changes can be seen for every 100 mile.

**Desha in relation to expounding the chapters**

Two types of learning systems were followed in ancient India namely Shalina and Charika. In Shalina system of education, a Guru would establish a Gurukula/study center and students who were eager to learn would go to Gurukula and learn. In Charika system of education, the Guru would wander with his students to different places and impart knowledge.\(^{[89]}\) The latter was followed in Charaka Samhita where Punarvasu Atrey was travelling to Kampilya, Panchaganga, Himalaya, and so on with his students. Meanwhile he was expounding the disease, which was more prevalent in that region to his students, that is, Raktabittta in Panchaganga, Udara in Kailasa, Janapadodhwamsa in Kailasa, and so on.

Panchaganga is the present area of Punjab region of India and Pakistan. It has very hot climate and hence people here are more prone to bleeding disorders.

The physicians coming from different places to attend symposiums and the native regions of the authors indicate the different centers of learning.

**Drugs with respect to Desha**

The medicinal plants indigenous to the place will be more potent and hence to make a more potent medicine, the drug of the native region should be collected. Chakrapani opines the drugs native to Himalaya if collected from other regions will have low potency.\(^{[90]}\) The latter was followed in Charaka Samhita where Punarvasu Atrey was travelling to Kampilya, Panchaganga, Himalaya, and so on with his students. Meanwhile he was expounding the disease, which was more prevalent in that region to his students, that is, Raktabittta in Panchaganga, Udara in Kailasa, Janapadodhwamsa in Kailasa, and so on.

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**Rivers in relation to Desha**

East flowing rivers are preferred over the west flowing rivers. The major east flowing rivers are Ganga, Yamuna and Krishna whereas the major west flowing rivers are Narmada and Tapti. The water of Ganga is an exception and is considered to be conducive to health.

The water of river Yamuna is considered to be Guru, Vatatala and Ruksha whereas that of Krishna is Ruksha, Vataraktaprapopana, Kinchitlaghu, and Swadhu. The water of river Narmada is Atiswachcha, Prashasta, Laghu, Lekhana, and cures all diseases.\(^{[91]}\)

**Salt in relation to Desha**

Saindhava is understood to be rock salt, white cubic crystals of superior quality. The name suggests that it comes from Sindh. The Kachh area of Sindh which is around Karachi is either low and wetland or a salt desert. Rocksalt mines of Khewra, Pakistan, and that in Jhelum district are two beds of rock-salt of 550 ft. thickness, which are being mined. Thus, the possibility of Saindhava originating in the border areas of Sindh can be established. This can be supported by linguistics: Sindh was originally a land of the river Indus (in Sanskrit Sind), not necessarily the small area of a province Sindh. The other possibility, wherein Sindh, a salt of high quality could have been found and/or prepared, is from the salty deposits around the numerous hot springs located in Sindh.

Sutvarchala-The name Sutvarchala relates with Saurashtra. It is, however, very difficult from the scanty reports available to make any conclusions about the composition (or preparation) of this salt variety. The area between Kachch and Gujarart changed considerably due to the rise of the sea-bed and the subsequent evaporation of the water left behind. The extracts from certain types of salty soil could yield only such a type of salt, whose components are those of the sea salt, but in different proportions.

Romaka is understood as the salt collected from river Ruma, a tributary of Indus. The name of Romaka people is said to be mentioned 3 times in Gunapatha Purana and from Brhatasamhita. One can conclude that the habitat of this people was at the mouth of Indus; it was probably a Roman colony somewhere near the ancient port of Barbarium. Thus, Romaka will be closely related to Saindhava Lavana, linguistically and geographically.

Pamshuja-Chakrapani specifically says the origin of Pamsuja is from Purva Samudra, that is, from the Eastern Sea. He being a Bengali may have got some information about the manufacture of Pamsuja salt from the sea on the eastern coast, that is, in the Bay of Bengal. This would make it a variety of Samudra, obtained however not from the sea water, but from the water of lowland coastal areas, where the sea water partially seeps in. This salt could also be extracted from the earth of those areas, unfit for agriculture, and for a considerable time in the past flooded with sea water. Due to selective absorption...
of soil particles in respect to ions of the sea water, as well as the action of certain halophytic bacteria, the chemical composition of Pansuja would not be identical with that of Samudra, because certain components were immobilized/absorbed/transformed.\textsuperscript{[92]}

**Mensuration system**

Magadha system of posology is considered superior to Kalinga as Magadha was a bigger and more powerful province than the province of Kalinga.

**Desha in relation to Satmya**

The concept of Satmya plays an important role in advising Pathya and Apathya.

**Desha in relation to Arishta**

The regions Andhra and Dravida lay in the southern part of the country. It is generally believed that southern direction is the abode of Yama, the God of death and hence considered as inauspicious.

**Miscellaneous**

Pataliputra was the capital of Magadha, the most powerful kingdom of that period. Hence, its example for Deshantara Gati is very apt.

Certain words in Charaka Samhita like Dambati\textsuperscript{[93]} and so on are not from classical Sanskrit. It is colloquial usage and may have geographical influence.

**Scope and Limitations**

Reconstructing the geography of Charaka Samhita is a Herculean task as the frequent wars between the kings of different provinces forced to redraw the boundaries. However, this is an attempt to relive the days of Charaka Samhita and an approximate estimation of the location of different regions of the then India is made.

Although the text mentions the different provinces and geographical locators, the concept of Jangala, Aanoopa and Sadharana is ultimate. In the same province, few regions may have the characteristics of Jangala, and few Aanoopa and the rest may be Sadharana. There are examples where the features of Jangala and Aanoopa are seen within a distance of 100 miles. Hence, there is no equation of places for climatic conditions in the classics, but only its geographical description. This concept of Jangala, Aanoopa, and Sadharana is time tested and are acceptable irrespective of time.

### Table 1: Correlation between Ayurvedic and contemporary concepts of geography

<table>
<thead>
<tr>
<th>Ayurveda</th>
<th>Contemporary view</th>
<th>Rainfall (cm)</th>
<th>Temperature</th>
<th>Region</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aanoopa Desha</td>
<td>Tropical rainforest</td>
<td>&gt;200</td>
<td>18.2°C-29°C</td>
<td>Western coastal region and parts of northeastern India</td>
</tr>
<tr>
<td>Tropical savanna</td>
<td></td>
<td>76-152</td>
<td>Above 18.2°C</td>
<td>Peninsular plateau except for the semi arid zone of the east sahyadris</td>
</tr>
<tr>
<td>Jangala Desha</td>
<td>Tropical semiarid steppe</td>
<td>38.1-72.2</td>
<td>20°C-28.8°C in December. 32.8°C in May</td>
<td>Rain shadow belt from central Maharashtra to Tamil Nadu</td>
</tr>
<tr>
<td>Tropical desert climate</td>
<td></td>
<td>&lt;30.5</td>
<td>Above 34.5°C</td>
<td>Rajasthan and a part of Rann of Kutch</td>
</tr>
<tr>
<td>Sadharana Desha</td>
<td>Tropical and subtropical steppe</td>
<td>30.5-63.5</td>
<td>12°C-35°C</td>
<td>Punjab to Kutch</td>
</tr>
</tbody>
</table>

**Conclusion**

Knowledge of Desha helps in drug identification and drug discovery. The role of Desha in advising the Pathya and Apathya cannot be ruled out. Though there are descriptions of various regions in the classics, the concept of Jangala, Aanoopa, and Sadharana is the ultimate. It has to be kept in mind while assessing the Hetu and also in deciding the treatment.

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