

## Concept of Anthropometry in Ayurveda

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### ABSTRACT

Research is an integral part of any health science. Ayurveda being science of life also needs of continued research to extrapolate the concepts and approaches. Apart from that, should we consider the health vs life, both sciences make a real effect. Life expectancy has been a topic of great interest now a days and need of debate since antiquity. Pramana sharir vs anthropometry draws a clear line of distinction ascertaining the health and life of an individual based on accumulated data. It has become more relevant in current era. Human resource is vital to growth of any country, so health care professionals, scientists, industry partners & economists as well are pondering over the issue to enhance the healthy lifespan and increase productivity. Ayurveda has provided an operational framework for assessment of Ayu-praman and enumerated Ayu janak & Ayu vighatakar factors which needs to be analysed & to be adopted with a personalized approach. The current review is an attempt to view the life expectancy in modern biology perspective followed by the compressive approach of Ayurveda descriptions. Finally, the factors effecting longevity and methods to achieve optimum healthy life span are discussed.

**KEYWORDS:** Ayurveda, Ayurveda textbooks (*samhitas*), Anguli (*finger*), Pramana (*body measurements or quantities*).

### INTRODUCTION

Ayurveda witnessed a shift towards rational principles in the practice of medicine, at a very early stage in its evolutionary history. The early classical Ayurveda textbooks (*samhitas*) speak about the validation of knowledge and distinguish between real and reel effects of therapy.<sup>2</sup> These works also contain elaborate methods to study properties of drugs, to develop new medical formulations, and protocols to study and understand the occurrence of new diseases. Research, it appears, was therefore in some way ingrained in the tradition of *Ayurveda* from the very beginning. For centuries, *Ayurveda* seems to have perpetuated itself as a tradition of practices and knowledge transmitted through apprenticeship or more formal methods of pedagogy, in some instances akin to a university education. Research in the modern sense of the word is a recent development in the field of *Ayurveda*, it seems<sup>3</sup>.

The encounter with western medicine sparked the debate in modern times regarding the necessity of

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research in *Ayurveda*. For quite some time, staunch traditionalists swore that *Ayurveda* was time-tested and that there was no scope for any new research. On the other hand, the progressive-minded emphasized that *Ayurveda* needs to be subjected to scientific scrutiny and only that is come out from the trials can be accepted. The truth seems to lie somewhere in between these two extreme views<sup>4</sup>. Just because *Ayurveda* has a continuity of tradition spanning many centuries, cannot be reason enough for its authenticity and its acceptance as a whole. An obvious reason is that there have been interruptions in the transmission of *Ayurvedic* knowledge as well as ups and downs in its evolution. There is evidence that much of the knowledge preserved by oral traditions has been lost in the passage of time. Therefore, it is necessary to revisit *Ayurveda* and find proper applications of it for present times<sup>5</sup>. Importantly though, the methods of modern science cannot be accepted fully as such while downloading the concept of evidence-based

Ayurveda specially because of the basic differences in the philosophies of both sciences. Perhaps there is need to design a specific method of evaluation process that is adopted to evaluate and validate outside the purview of pure scientific methods, or the modern science could be tweaked to make it more appropriate for *Ayurveda*; or new methods of enquiry and validation could be developed and expanded on the basis of the epistemological premises of *Ayurveda* itself?

The beginnings of modern research in *Ayurveda* can be traced to the pre-colonial period and the first encounters of Europeans with indigenous healthcare systems in India<sup>6</sup>. During this giving assistance to Centres of Excellence; and revitalizing and validating local or folk expressions of AYUSH. The complete negligence of *Ayurveda* in recent health policy documents, zero efforts to implement the strategy of the central Indian government (National Rural Health Mission) to co-locate *Ayurvedic* and biomedical facilities in India, and failing to incorporate *Ayurveda* in public health. *Ayurveda* has not been consciously included in any of the recent public health programmes, but an innovative health system approach must be more inclusive and recognize the worth of plural medicine<sup>7</sup>. When indigenous medical systems are taken into account, inequality in healthcare utilization can be minimized. Interventions in *Ayurveda* should focus on how the local market can be supplied with affordable *Ayurvedic* medicines and treatments.

### 1. Insight:

Most living species have at least one upper limit on the number of times cells can divide, although number of cell divisions does not strictly control lifespan. Maximum life span contrasts with mean life span (average life span or life expectancy). Mean life span varies with susceptibility to disease, accident, suicide and homicide, whereas maximum life span is determined by "rate of aging". Life expectancy is one of the factors in measuring the Human Development Index (HDI) of each nation, along with adult literacy, education, and standard of living. It is also used in describing the physical quality of life of an area or, for an individual, when determining the value of a life settlement, a life insurance policy sold for a cash asset<sup>8</sup>. *Ayurveda* the science of life is regarded as coexisting along with life & its evolution. Its fundamental principles have keys to the quest related to life & its various dimensions. Here we would discuss & analyse the principles of *Ayurveda* to extend the periphery of current biological understanding.

Life expectancy is an output of a life table. It summarizes the mortality pattern that prevails across all age groups such as children, adolescents, adults and the elderly. *Ayurveda* presents the concept of *Ayu praman* in the other hand which gives deeper insight to the physiological aspects and simultaneously indicating the opportunities to intervene/manage. *Ayu pramana* assessment relies on constitutional factors which fore tells the maximum potential one could live, this could partially co relatable with maximum life span. But in contrast to maximum life span it has incorporated the basic frame work that each individual has different potential owing to the biological variability.

*Pramana* or body measurements or quantities or configuration or dimensions are measured in three ways. *Pramana* for all types of *Ayu* i.e. *hita*, *ahita*, *sukha* and *dukha* has been described in *Ayurveda*. While defining *Ayurveda* only, it has been emphasized that *Ayu* (continuation/sustenance of life) is very dynamic & requires fine equilibrium between its constituents. Objective of this *Ayu* or life span is also directed to achieve *chatur varga* i.e. four accomplishments (*Dharma*, *Artha*, *Kaama*, *Moksha*)<sup>9</sup>

1. *Anjali pramana* – measurement of Volume
2. *Anguli Pramana* – measurement of length
3. *Sankhya Shareera* – counts, or numbers.

Anthropometry may conveniently be subdivided into the following sections

- Somatometry- measurement of the living body including head and face.
- Osteometry—measurement of the skeletal long and short bones.
- Craniometry- measurement of the skeletal brain cavity (neurocranium) and face (splanchnocranium).

Anthropometric measurements are used as a proxy measure for many purposes for the assessment of health status, physique, obesity, malnutrition, disease and work capacity. Anthropometry provides a scientific method and technique for taking various measurements in different geographic regions and races. Science of Anthropometry is used in field of Surgery, Cosmetology and Forensic science. It is used for the diagnosis of many diseases, to assess the nutritional status, in growth and developmental study and to design many medical and other instruments for human use.

### *Anguli* means finger.<sup>10</sup>

The length, breadth, and circumference of the structures of the body are measured with the help of *anguli pramana*. The *Anguli Pramana* is calculated on the basis of 'Swa *Anguli Pramana*' or the length equal to the length of the transverse measurement of

one's own middle phalanx (middle segment of bone) of the middle finger (*madhyama anguli*). Thus, *Anguli pramana* is the unit of measurement of the length of the body parts and structures.

Ayurveda by definition incorporates the different mode and quality of life along with predicting lifespan for individual & population. This could be done on the basis of examining certain features.

For the current epoch 100 years is the average & expected lifespan but to achieve it one requires following factors.

- Prakruti sampat* (sama prakriti, *kapha prakriti*, *pitta prakriti*, *vata prakriti*)
- Guna sampat (*saara*, *samhanana*)
- Atma sampat* (individuality)

The below table depicts the details of *Aayama and Vistaara* with self-finger measurements with mean, median, mode and SD including the ranges.

The above table depicts on anguli pramana and its process, and below depicts on the different body part measurement.

The height of Sarva Shareera given as 120 anguli is the reference from Sushruta. Dalhana, commentator of Sushruta Samhita tells that the height of the body with both upper limbs raised is 120 angulis.

Vyama (No 30) – Distance between right and left fingertips when both the arms are completely abducted. Sushruta has mentioned the dimension of Stree vaksha (chest of female) as 18 angulas

### Significance of Anguli Pramana

*Anguli pramana* gives us an accurate measurement of the body parts. When they are in normal proportions, they indicate good health. Anything less or more than the mentioned norms would suggest abnormality and pathology. It indicates that there is a proportional imbalance in body dimensions. This would indicate that the person whose *anguli pramana* is being measured is not at the best of his or her health.

Praman	Life span in years	Bala	Madhya	Vridha
Deerghayu	120 years	Up to 30 years	Till 72 years	Afterwards
Alpayu	80 years	Up to 25 years	Till 50 years	Afterwards

### 3. Research In Paraman Sharir: Gate Way to Fundamental Research:

There are many descriptions in Ayurveda texts related to *Ayu pamana* and the methods to assess it. Broadly in two ways we can assess the *Ayu pramana* (lifespan). First to assess the biological potential on the basis of constitutional features and secondly to predict the remaining life span after emergence of any disease.

### Anthropometry and Suśrutokta Aṅgula Pramāṇa śārīra:-

Anthropometry deals with various measurements related to the human body such as pelvimetry, craniometry, osteometry, skin fold thickness, height and weight measurements etc. The number and type of measurements have varied with the nature of the problems. *Ācārya Suśruta* have given the measurements of various parts, sub-parts and structures of body in terms of *Aṅguli Pramāṇa*. These measurements were given for *sama pramāṇa* individual having perfect body proportions. Individuals having equal total height/Stature and Width/Span of body are called *Sama pramana* and have good health, *ojas*, *bala*, *sukha* and longevity<sup>11</sup>

### 2. Ayu Praman Or Lifespan And Its Principles:

Although the natural potential lifespan for this epoch is said to be 100yrs but we need to examine *prakruti*, *guna sampat* of individual & the regimen one follows, which usually comprising of:

- Ayatha bala aarambha*
- Ayatha agni abhyvahanana*
- Vishama sharira nyasa*
- Ati maithuna*
- Udeerna vega vinigraha*
- Vidhrya vega vidharanat*
- Visha-Vayu-Agni-upatapa*
- Abhighta-Ahara pratikara vivarjana*
- Jwaradi aatakkat mithyaupachara*

Hence we need to know regarding the *hetus* or factors which could influence maintenance of normal lifespan & what are the measures which if undertaken can extend *Ayupramana* or lifespan to its full potential. Deviation from right way of living & accordingly decline of *sharira poshana karma*. As per *Chakrapani* if optimum *Prakriti & Bal* constituents an individual then he/she could extend lifespan beyond 100 years also. In case the lifespan is decreased or elongated/ enhanced the division of *Ayu* like *bala-madhya-vrudha* is also revised.

The first approach encompasses two type of factors which influence the potential *Ayu pramana* like *Prakriti*, *Sara*, *Pramana* which are mostly constitutional factors & are independent of individual's interaction with the environment, but rest like *Satmya & Aharashakti* are partly constitutional tendencies and partly adaptable behaviours. The second approach to assess the remaining lifespan is based on mostly *arista* which are reflected

psychosomatically and can give definitive predictions of rest life days.

Now coming to the methods which can be adopted for these assessments are

1. Observation of anatomical features, physical and physiological tendencies and
2. Subjective interrogation

**The features to be observed here as below**

**A. Deha pramana:**

Observations are to be made regarding symmetry, proportion, bulk/built and integrity of the body parts.

**B. Prakriti:**

The Prakriti type of an individual holds the clue for his/her biological potential of lifespan. As per *Charaka Samhita* the Individual with *Sama Prakriti* has highest potential for longer life.

**C. Sara:**

*Sara* of an individual is vital factor to decide the life expectancy which has a decreasing order from *Satva sara* towards *Twak sara*. *Satva Sara* has the maximum potential for a long healthy life and *Twak sara* individual would have the least comparatively. As per *Charaka* the individual with *sarva sara* would have the maximum longevity, but *Twak sara*, *Mamsa Sara*, *Asthi sara* and *Majja sara* would also live for long in comparison to others. *Sara* can be examined by observing the features the *sara* whether present in the individual.

**D. Satmya:**

*Satmya* is the adaptability or suitability related to an individual, it can be related with *Ahara* (diet), the *Rasa* (taste), *Ritu* (seasons) etc. *Charaka Samhita* says that any individual with suitability to all the six *rasa*, *ghrita*, *kshira*, *taila*, *mamsa rasa* are strong, enduring and long lived. On the contrary those individuals suited to *ruksha ahara*, single *rasa* is usually weak, with less endurance and not live longer. Those with mixed suitability have medium strength. *Satmya* can be examined by observing the suitability to diet, its constituents, weather, places etc.

**E. Ahara shakti:**

*Ahara* or diet has a vital role in maintaining strength and longevity. Its constituents, amount and individual's digestive capacity & appetite are the factors which result for optimum utilization of diet for maintaining quality life and longevity.

**F. Lakshana:**

Specific features (signs or symptoms) are indicative of longevity.

There is ample need of research that should be aimed to establish the above facts and help in attaining best health which protects from unnecessary disabilities

and discomfort at the domestic front. This study will be helpful in providing better evidence-based medicine.

**Discussion:-**

Anthropometry is branch of Anthropology which specifically deals with the measurements relating to human body. Branch of *śārīra* dealing with *pramāṇa* or measurements is *pramāṇa śārīra*. *Aṅguli Pramāṇa śārīra* can be correlated with Anthropometry. The words 'pramāṇa' and 'metry' are related to measurements. In context of *pramāṇa śārīra*, *pramāṇa* is considered in context of various body measurements. There is very detailed description of *aṅgula pramāṇa* given in *Suśruta saṁhitā* in which measurements of various human body parts were given. Human body measurements given were very scientific and accurate as it was based on person's own finger width or *svāṅguli pramāṇa*. Nowadays various unit systems have been given for measurements e.g. SI, MKS and CGS System. But in *saṁhitā* period, *aṅgula pramāṇa* was used for measuring lengths. *Aṅgula pramāṇa* is a good tool to describe measurements as it was personalised as it differs from individual to individual and it was standardised because the result measured was not an absolute value but a ratio between the lengths of the part measured to the *aṅguli māna*. This indicates that Anthropometry was well developed thousands of years back.

**Contribution to Vyavhar Ayurveda**

Anthropometric data can be used to evaluate unknown body measurements from known measurements. This is highly significant in developing concepts related to forensic medicine in *Ayurveda*, a perfect example in this regard being estimation of total height from various known measurements based on references of *Pramāṇa Shareer*.

Thus, we can see concepts of anthropometry are described in *saṁhitas* at places with significant elaboration which shows concept of anthropometry in *ayurveda* and shows the path for further illustration for better use.

**Conclusion:**

Whereas the difference between *Ayama* & *Vistara* lies between 0 to 2 *angula* then *Bala* of an individual lies at its maximum. Whereas the difference between *Ayama* & *Vistara* lies between 2 to 4 *angula* and *Bala* of an individual lies at its medium. And as difference between *Ayama* & *Vistara* lies Below 4 *angula* then the *Bala* of an individual lies at its minimum. There is a positive relation between the difference between *Ayama* and *Vistara* with the said criteria *Deerghayu* and *Bala*.

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