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RESEARCH ARTICLE

ANTHROPOMETRY IN AYURVEDA W.S.R. TO SUŚRUTOKTA AṄGULA PRAMĀᅇA ŚĀRĪRA

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Abstract

Anthropometry is the branch of anthropology which refers to taking quantitative measurements of human body. Human body measurements convey a lot of information about an individual's physical status, shape, size, physique and body composition. *Ayurvedic* literature furnishes detailed description on measurements of body and its elements. *Ācārya* has devised suitable methods for measurements of human body and contents of body. In *Ayurveda* classics *Pramāᅇa śārĪra* is the term given to this subdivision which depicts the importance of measurements or anthropometry. *Aᅅjali pramāᅇa* and *Aᅅgula pramāᅇa* were used to measure body and its contents. *Ācārya Suśruta* has described *pramāᅇa śārĪra* in context of *ātura parĪkᅇā* or examination of the patient and described measurements of various body structures in terms of *Aᅅgula pramāᅇa*. *Aᅅgula Pramāᅇa śārĪra* is the term given to that section which depicts the importance of anthropometry in contemporary sciences.

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Introduction:-

Anthropometry¹—the measurements of man—provides scientific methods and techniques for taking various measurements and observations on the living man and the skeleton. It is the science that defines physical measures of a person's size, form and functional capacities. There are various methods given by *Ayurveda Ācārya* to examine the individual to determine the normal and abnormal condition. *Pramāᅇa parĪkᅇā* is included in *daśavidha āturaparĪkᅇā*, given by *Ācārya Caraka*. *Ācārya Suśruta* described *pramāᅇa śārĪra* in *Sūtrasthāna*. *Ācārya Vagbhata* has also given the measurements of body parts and fluids of body. The morphological characters such as height, breadth etc is given in *sva aᅅguli pramāᅇa* (breadth of one's own finger). *Aᅅguli* means finger and *pramāᅇa* means measurement. On the basis of these measurements, body proportion of an individual can be known. Individual having perfect body proportion known as *Sama pramāᅇa* is considered to have more longevity.

Anthropometry:-

The word 'Anthropos' means human and 'metron' means measurement. It is the science of measurements of human body. The term anthropometry was given in seventeenth century, by a German Physician J.S. Elsholtz. It encompasses a wide variety of measurement procedures for determining a number of body dimensions². It is the science that defines physical measures of a person's size, form and functional capacities. The origin of anthropometry is very ancient. The famous 15th century Italian artist, engineer and architect, Leonardo da Vinci (1452-1519) gave the concept and drawing of such a well proportioned physique. His *Vitruvian Man* survives till

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date and is widely used as a logo³. The scientific anthropometry, however, began with Johann Friedrich Blumenbach (1752-1840), around 250 years ago, who laid the foundations of Craniology⁴. Now Anthropologists have devised a number of measurements for describing the morphology of man. These measurements are defined on the basis of anatomical landmarks and have been in use for hundreds of years. These are various techniques for taking measurements of body. Various instruments used for taking measurements in anthropometry are Anthropometer Rod, Rod compass, Head Height needle, Spreading caliper, Sliding caliper, Palatometer, Goniometer, Skinfold Caliper, Measuring Tape, Craniophore, Reid's Osteometric Board, Parallelograph, Bone holder etc. Anthropometry may conveniently be subdivided into the following sections⁵:

- ❖ 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 access the nutritional status, in growth and developmental study and to design many medical and other instruments for human use.

Pramāṇa śārīra:-

Pramāṇa is the tool for acquiring knowledge. Measurements of body or its constituents are *Pramāṇa*. *Ācārya* have given the measurements of various body parts and sub parts, body constituents and life span of body. In order to measure the volume of body components (e.g. *Jal, Rakta, Vasā, Majjā, Purīṣa, Mūtra, Sveda* etc.), *Añjali pramāṇais* used. *Aṅgula pramāṇa* is used to measure the lengths of different body parts. Digit of hand is *Aṅguli* and *pramāṇa* means measurement. *Aṅguli Pramāṇa śārīra* is the term given to that section which depicts the importance of anthropometry in contemporary sciences. The morphological characters such as height, breadth etc was given and measured in *sva aṅguli pramāṇa* (breadth of one's own finger).

Concept of *aṅguli pramāṇa* is available in *Vedas, Purāṇas* and other *Ayurvedic* classical texts. In *Yajurveda*, *aṅguli pramāṇa* is cited in the *homakuṇḍa* preparation. In *Agni purāṇa* second *khaṇḍa*, *aṅgula pramāṇa* of different body parts (eg *hrdaya, kaṭi*, etc) are cited. *Bhela* has mentioned *aṅgula pramāṇa* while explaining the life- span of individual⁶. *Ācārya Suśruta, Ācārya Caraka* and *Ācārya Vagbhata* also described *pramāṇa śārīra*^{7,8,9,10} in detail.

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 pramāṇa* and have good health, *ojas, bala, sukha* and longevity¹¹. Some of the measurements given by *Ācārya Suśruta* are¹²:

- ❖ The *pādāṅguṣṭha* (great toe) and *pradeśini* (second toe) of the foot are 2 *aṅgula* long by measuring with own fingers.
- ❖ *Madhyamā* (third toe), *ānāmikā* (fourth toe), *kaniṣṭhikā* (fifth toe) are successively one-fifth less than second toe.
- ❖ *Pāda* (foot) is 14 *aṅgula* in length.
- ❖ Length of *Jaṅghā* (leg) and *ūru* (thigh) are 18 *aṅgula*
- ❖ Length of portion between *jānu sandhi* and *kati sandhi* is 32 *aṅgula* in length
- ❖ Total length of lower extremity is 50 *aṅgula*.
- ❖ The length of *Vrṣaṇa* (Scrotum), *Chibuka*(Chin), *Daśana*(teeth), *Nāsāpuṭa* (Nostrils/Nasal breadth), *Karṇamūla*(base of external ear), *Nayanāntara* (distance between two inner canthus of eyes) is two *aṅgula*.
- ❖ The lengths of *Mehana* (Penis), *Vadanāntara* (distance between angles of mouth), *Nāsā* (Nose/Nasal height), *Karṇa*(external ear), *Lalāta*(Forehead), *Grīvā* and distance between the two *Driṣṭi maṇḍalas*(Pupils) is 4 *aṅgula*.
- ❖ The breadth of *Bhaga*(Pubis), the distance between *Mehana*(Penis) and *Nābhi*(Umbilicus), the distance between *Nābhi*(Umbilicus) and *Hṛdaya*(heart), distance between *Hṛdaya*(heart) and *Grīva*(root of neck), distance

between two *Stanās*(breasts), *Mukhāyāma*(distance between chin and top of forehead), and circumference of *Mañibandha*(wrist) is 12 *aṅgula* each.

- ❖ The distance of *Hasta*(distance between *Kūrpara*(elbow) and the tip of middle finger) should be 24 *aṅgula*.
- ❖ Length of *Madhyamāṅguli*(middle finger of hand) is 5 *aṅgula*, *Pradeśinī*(Index finger) and *Anāmikā*(Ring finger) is 4.5 *aṅgula*, *Aṅguṣṭha*(Thumb) and *Kaniṣṭhikā*(Little finger) is 3.5 *aṅgula*.
- ❖ The breadth of *Mukha*(mouth) is 4 *aṅgula* and circumference of *Grīva* is 20 *aṅgula*.
- ❖ Female chest is of same measurement as that of male waist; *uras*(chest)of female and *śroni*(waist)of male are 18 *aṅgula*
- ❖ Total *āyāma*(height) of *Puruṣa*(entire body) is 120 *aṅgula*.

If an individual is endowed with measurement of *sama pramāna*, he attains long life and prosperity¹³. For examination of patient, knowledge of normal *pramāna* of body is important. Knowledge of Normal *pramāna* of body is also important in various surgical interventions e.g. *Nāsā saṅdhāna*.

Discussion:-

Anthropometry is branch of Anthropology which specifically deals with the measurements relating to human body. Branch of *śārīra* dealing with *pramāna* or measurements is *pramāna śārīra*. *Aṅguli Pramāna śārīra* can be correlated with Anthropometry. The words 'pramāna' and 'metry' are related to measurements. In context of *pramāna śārīra*, *pramāna* is considered in context of various body measurements. There is very detailed description of *aṅgula pramāna* given in *Suśruta saṃhitā* 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 pramāna*. Nowadays various unit systems have been given for measurements e.g. SI, MKS and CGS System. But in *saṃhitā* period, *aṅgula pramāna* was used for measuring lengths. *Aṅgula pramāna* is a good tool to describe measurements as it was personalised as it differs from individual to individual and it was standardise 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.

Conclusion:-

So it can be concluded that Anthropometry or human body measurements were described in *Ayurveda* classical texts thousands of years ago as *Aṅguli Pramāna śārīra*. *Ācārya Suśruta* described various body measurements in terms of *Aṅgula pramāna*. This indicates that Anthropometry was well developed thousands of years back and was very scientific and accurate.

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