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Research Article

ANGULI PRAMAAN OF UDAR (ABDOMEN) IN STHAULYA (OBESE) PERSON AND BODY MASS INDEX: COMPARATIVE STUDY

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ABSTRACT

The principle of Anguli Pramaan ancient but must have definite scientific value which is new to be evaluated today. It is of great significance as it helps to determine the life expectancy of an individual and it proves the individualistic approach of Ayurveda. The concept of anguli pramaan mentioned in Ayurveda and BMI of modern science these two methods are different from each other but their utility is going to asses' health of person. Calculation of Anguli Pramaan was done with the help of Vernier calliper measuring of breadth between parvasandhi and panital sandhi of both hands were taken it put in the formula and get the measurement of Swanguli Pramaan in centimeter. Measurement of Aayaam, Vistaar, Parinaah of the Udar was taken by the centimeter Simultaneously in proper position of examinee with the help of measuring tape then convert the obtained reading in the anguli pramaan by division for one anguli in centimeter. For Calculation of BMI (Body Mass Index) - weight of examiner was taken with help of weighing machine. Already measured height in centimeter was converted in meter BMI taken by formula as mention in material and method. Here the selected 75 person were taken with the help of BMI person were divided into the 5 groups and comparative study was done by statistical analysis.

Keywords: Anguli Pramaan, Sthaulya (Obese), BMI, Aayaam, Vistaar, Parinaah.

INTRODUCTION

The expert physician succeeds in his work if he precedes after examination the life span particularly on the basis of measurement (Pramaan) of different parts of body and essential predominance of dhatus saara¹. A person endowed with Pramaanavat Shareera will have longevity, strength, happiness, power, wealth and virtues where as those with high or poor measurements will hold qualities contrary to that which explained in the classics². It means measure the anguli pramaan of female with her fingers, of male with his finger and of children with their own finger³. A person who due to extensive growth of fat and flesh is unable to work and disfigured with pendulous nitamb, abdomen, stan is called atisthaulya². Obesity is therefore more effectively defined by assessing its linkage to morbidity or mortality. Although not a direct measure of adiposity, the most widely used method to gauge obesity is the body mass index (BMI), which is equal to weight/height² (in kg/m²). Using data from the Metropolitan Life Tables, BMIs for the midpoint of all heights and frames among both men and women range from 19 to 26 kg/m²; at a similar BMI, women have more body fat than men. Based on unequivocal data of substantial morbidity, a BMI of 30 is most commonly used as a threshold for obesity in both men and women⁴. Udar⁵ is Abdomen⁶ In obese (sthaulya) person medovridhi is commonly seen at site of udar⁷. Various conceptual terms

like Aayaam, Vistaar and Parinaah are described under the sphere of Swaanguli pramaan¹. Body Mass Index (BMI): individual it is defined as weight in kilogram divided by the square of the height in meter (wt in kg/ht in m²)⁸. The aim proposal study was to evaluate if there is any correlation between the anguli pramaan of udar and BMI and to establish the practical utility of anguli pramaan on the basis of literature mentioned by acharya and commentator we plan a work as.

MATERIAL AND METHOD

We had taken vernier caliper, measuring tape, weighting machine for Anguli Pramaan and BMI of Individual Persons. We carried out this work at our Institute Government Ayurved College and Hospital, Nagpur, India.

Inclusion Criteria

Obese Person, BMI above the 18.5 and Age between 18 to 60 years

Exclusion Criteria

- Age below 18 years and above 60 years,
- BMI lower than 18.5,
- Pregnant,
- Person with abdominal problem, other systemic Diseases.

Anguli Pramaan

Calculation of Anguli Pramaan was done with the help of Vernier caliper, measuring of breadth between parvasandhi and panital sandhi of both hands were taken it put in the following formula and get the measuring of swanguli pramaan in centimeter

$$\text{Swanguli Pramaan} = \frac{\text{Breadth between Parvasandhi and Panital joint of both hands}}{8}$$

Aayaam, Vistaar, Parinaah of the Udar measurement was taken by the centimeter simultaneously in Proper position of examinee with the help of measuring tape then convert the obtained reading in the Anguli Pramaan by Division one anguli in centimeter as follows

Aayaam

Mid clavicular line (mammary line)- This line passes through the midpoint of the clavicle, crosses the costal margin just lateral to the tip of the ninth costal cartilage, and passes through a point mid way between the anterior superior iliac spine and the symphysis pubis. Took a both line 1st right and 2nd left. 3rd line is trans umbilical line which line is take horizontal from the umbilicus. This trans umbilical line meet to the two vertical line at which point from this point took measurement for the aayaam. For Vistaar 1st line; the transpyloric plane lies midway between the suprasternal notch of the manubrium and the upper border of the pubic symphysis. It usually lies at the level of the body of the first lumbar vertebra near its lower border and meets the costal margins at the tips of the ninth costal cartilages, where a distinct 'step' may be felt at the costal margin. 2nd line the

trans tubercular plane joins the tubercles of the iliac crests and usually lies at the level of the body of the fifth lumbar vertebra near its upper border. 3rd line is Midline of body which line is taken vertical from the umbilicus. This midline meets to the two horizontal lines at which point from this point took measurement for the Vistaar.

Parinaah

Take an abdominal circumference (Abdominal girth) from the umbilicus take measurement for parinaah.

Body Mass Index

Body Mass Index (BMI) is commonly used in classifying overweight and obesity in adult population and it is defined as weight in kilogram divided by the square of the height in meter (wt in kg/m²). Here selected 75 person were taken with the help of BMI, were divided into the 5 groups as mention below; Abdominal Aayaam, Vistaar, Parinaah taken from the 75 person these Person divide in 5 different groups are followed

18.5 to 24.9 - Normal Weight
25 to 29.9 - Over Weight
30 to 34.9 - Obese
35 to 39.9 - Highly Obese
40 and above - Highly Obese

Here the 75 person were taken with the help of BMI person divided into the 5 groups as mentioned before and comparative study were done by statistical analysis.

RESULT AND DISCUSSION**Table 1: Sex Wise Distribution of Total 75 Persons**

Group	I		II		III		IV		V	
		%		%		%		%		%
Male	13	86.58	11	73.26	14	93.24	11	73.26	7	46.62
Female	2	13.32	4	26.64	1	6.66	4	26.64	8	53.28

Sex wise results of Group – I – Male 13 (86.58 %) and Female 2 (13.32 %), Group – II – Male 11 (73.26 %) and Female 4 (26.64 %), Group – III – Male 14 (93.24 %) and Female 1 (6.66 %), Group – IV – Male 11 (73.26 %) and Female 4 (26.64 %) and Group – V – Male 7 (46.62 %) and Female 8 (53.28 %) were observed.

Table 2: Age Wise Distribution of Total 75 Persons

Age in Years	I		II		III		IV		V	
18 – 26	8	53.28 %	3	19.98 %	2	13.32 %	2	13.32 %	-	-
26 - 32	6	39.96 %	7	46.62 %	7	46.62 %	3	19.98 %	3	19.98 %
32 - 38	1	6.66 %	4	26.64 %	1	6.66 %	2	13.32 %	2	13.32 %
38 - 44	-	-	-	-	4	26.64 %	5	33.3 %	2	13.32 %
44 - 50	-	-	1	6.66 %	1	6.66 %	3	19.98 %	6	39.96 %
50 - 56	-	-	-	-	-	-	-	-	2	13.32 %
56 – 60	-	-	-	-	-	-	-	-	-	-

Age wise results in percentage of Group – I – 18 – 26 in 8 (53.28 %), 26-32 in 6 (39.96 %), 32 - 38 in 1 (6.66 %), Group – II in 18 – 26 in 3 (19.98 %), 26 - 32 in 7 (46.62 %), 32 - 38 in 4 (26.64 %), 44 - 50 in 1 (6.66 %) Group – III – a 18 – 26 in 2 (13.32 %), 26 - 32 in 7 (46.62 %), 32 - 38 in 1 (6.66 %), 38 - 44 in 4 (26.64 %), 44 - 50 in 1 (6.66 %) Group – IV in 18 – 26 in 2 (13.32 %), 26 - 32 in 3 (19.98 %), 32 - 38 in 2 (13.32 %), 38 - 44 in 5 (33.3 %), 44 - 50 in 3 (19.98 %) and Group – V in 26 - 32 in 3 (19.98 %), 32 - 38 in 2 (13.32 %), 38 - 44 in 2 (13.32 %), 44 - 50 in 6 (39.96 %), 50 - 56 in 2 (13.32 %) were observed.

Table 3: Religion Wise Distribution of Total 75 Persons

Religion	I		II		III		IV		V	
Hindu	11	73.26 %	10	66.6 %	11	73.26 %	11	73.26 %	12	79.92 %
Muslim	1	6.66 %	2	13.32 %	-	-	-	-	2	13.32 %
Bauddha	4	26.64 %	3	19.98 %	4	26.64 %	4	26.64 %	1	6.66 %

Religion wise results in percentage of Group – I were in Hindu 11 (73.26 %), Muslim – 1 (6.66 %), Bauddha – 4 (26.64 %), Group – II were in Hindu –10 (66.6 %), Muslim – 2 (13.32 %), Bauddha – 3 (19.98 %) Group – III were in Hindu – 11 (73.26 %), Bauddha – 4 (26.64 %), Group – IV were in Hindu – 11 (73.26 %), Bauddha – 4 (26.64 %) and Group – V were in Hindu – 12 (79.92 %), Muslim – 2 (13.32 %), Bauddha – 1 (6.66 %), were observed.

Table 4: Anguli Pramaan in Centimeter Distribution

Groups (BMI)	I	II	III	IV	V
	18.5 – 24.9	25 – 29.9	30 – 34.9	35 – 39.9	> 40
Mean ± SD	1.92 ± 0.107	1.89 ± 0.123 ^{ns}	1.96 ± 0.09 ^{ns}	1.91 ± 0.07 ^{ns}	1.87 ± 0.1 ^{ns}

The results were expressed as Mean ± S.D. (n = 15), using one-way ANOVA followed by Dunnetts test^{ns} – not significant, P < 0.05, P < 0.01 compared with group – I. Angul in cm. observed in Group – I - 1.92 ± 0.107, Group – II - 1.89 ± 0.123, Group – III - 1.96 ± 0.09, Group – IV - 1.91 ± 0.07 and Group – V - 1.87 ± 0.1 were found. One-way ANOVA followed by Dunnetts test statistical analysis Group – I was compared with other Groups its values were statistically insignificant.

Table 5: BMI Groups Distributions

Groups (BMI)	I	II	III	IV	V
	18.5 – 24.9	25 – 29.9	30 – 34.9	35 – 39.9	> 40
Mean ± SD	22.24 ± 1.29	27.27 ± 1.25**	32.37 ± 1.36**	37.08 ± 1.17**	41.37 ± 0.88**

The results were expressed as Mean ± S.D. (n = 15), using one-way ANOVA followed by Dunnetts test^{ns} - Not significant, *P < 0.05, **P < 0.01 compared with group – I. Body Mass Index of Group – I - 22.24 ± 1.29, Group – II - 27.27 ± 1.25, Group – III - 32.37 ± 1.36, Group – IV - 37.08 ± 1.17 and Group – V - 41.37 ± 0.88 were observed. One - way ANOVA followed by Dunnetts test statistical analysis Group – I was compared with other Groups its values were significant.

Table 6: Aayaam Distributions

Groups	I	II	III	IV	V
	18.5 – 24.9	25 – 29.9	30 – 34.9	35 – 39.9	> 40
Mean ± SD	13.47 ± 1.48	16.72 ± 1.42**	18.5 ± 1.64**	23.45 ± 1.76**	27.03 ± 2.82**

The results were expressed as Mean ± S.D. (n = 15), using one-way ANOVA followed by Dunnetts test^{ns} - Not significant, *P < 0.05, **P < 0.01 compared with group – I. Result of Aayaam Group – I - 13.47 ± 1.48, Group – II - 16.72 ± 1.42, Group – III - 18.5 ± 1.64, Group – IV - 23.45 ± 1.76 and Group – V - 27.03 ± 2.82 were observed One-way ANOVA followed by Dunnetts test statistical analysis. Group – I was compared with other Groups its values were significant.

Table 7: Vistaar Distributions

Groups	I	II	III	IV	V
	18.5 – 24.9	25 – 29.9	30 – 34.9	35 – 39.9	> 40
Mean ± SD	13.54 ± 1.72	16.72 ± 1.42**	18.5 ± 1.64**	23.58 ± 1.43**	26.96 ± 2.88**

The results were expressed as Mean ± S.D. (n = 15), using one-way ANOVA followed by Dunnetts test^{ns} - Not significant, *P < 0.05, **P < 0.01 compared with group – I. Result of Vistaar Group – I - 13.54 ± 1.72, Group – II - 16.72 ± 1.42, Group – III - 18.5 ± 1.64, Group – IV - 23.58 ± 1.43, and Group – V - 26.96 ± 2.88 were observed. One-way ANOVA followed by Dunnetts test statistical analysis Group – I was compared with other Groups its values were significant.

Table 8: Parinaah Distributions

Groups (BMI)	I	II	III	IV	V
	18.5 – 24.9	25 – 29.9	30 – 34.9	35 – 39.9	> 40
Mean ± SD	42.82 ± 4.30	51.22 ± 4.71**	57.36 ± 5.2**	66.3 ± 3.79**	70.68 ± 4.59**

The results were expressed as Mean ± S.D. (n = 15), using one-way ANOVA followed by Dunnetts test^{ns} - Significant, *P < 0.05, **P < 0.01 compared with group – I. Result of Parinaah Group – I – 42.82 ± 4.30, Group – II – 51.22 ± 4.71, Group – III – 57.36 ± 5.2, Group – IV – 66.3 ± 3.79 and Group – V – 70.68 ± 4.59 were observed. One-way ANOVA followed by Dunnetts test statistical analysis Group – I was compared with other Groups its values were significant. In above observation at cm. in angul was insignificant and other results were significant.

Graph 1: Anguli Pramaan in Centimeter Distribution

Graph 2: BMI Groups Distributions

Graph 3: Aayaam Distributions

Graph 4: Vistaar Distributions

Graph 5: Parinaah Distributions

Graph 6: Aayaam, Vistaar, Parinaah Distribution

CONCLUSION

The review of literature and statistical analysis provides a useful conclusion. In Ayurved Textbooks we do not find the description about the Udar parinaah, description about the boundary of abdomen and aswasth (unhealthy). This study was done to check angul praman in centimeter, BMI and Udar (abdominal), Aayaam, Vistaar and parinaah which is calculated by Mean SD and one way ANOVA followed by Dunnett's test on statistical analysis. Anguli Pramaan –for the study of 5 Groups were taken for 1 angul in centimeter on statistical analysis the value are insignificant. In study 75 persons mean value of 1 angul pramaan is 1.91 cm. Body Mass Index – Group – I is compared with the another groups value on the statistical analysis were significant. Aayaam-Udar (abdomen) Mean aayaam in Group – I 13.47, Group – II 16.72, Group 18.5, Group – IV 23.45, Group – V 27.03 Group – I is compared with the other Groups values on statistical analysis were significant. Vistaar- Udar (abdomen) Mean vistaar in Group – I 13.54, Group – II 16.72, Group 18.5, Group – IV 23.58, Group – V 26.96 angul found Group – I is compared with the other Groups values on statistical analysis were significant. Parinaah- Udar (abdomen) Mean parinaah in Group – I 42.82, Group – II 51.22, Group 57.36,

Group – IV 66.30, Group – V 70.68 angul found Group – I is compared with the other Groups values on statistical analysis were significant.

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