

Study Variation of Anthropometric Variables at Time of Puberty

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Abstract

Aim: Puberty is vital stage of human growth and life cycle; this stage faces different psychological, physiological changes, it is a stage when individuals are going towards maturation. For this stage human needs sufficient nutrition, lack of nutrition causes delayed puberty, stunted growth, in female, lack of nutrition cause their menarche, if female under nutrition remains in time of their child bearing it effects in child weight, due to under nutrition girl suffers from anemia.

Methods: Study is done on adolescent girls of rural area of Paschim Medinipur, by anthropometric tools different anthropometric measurements were taken.

Results: The overall means, standard deviations of height and weight of the adolescent girls were 150.01 cm (4.81) and 44.06 kg (5.70) respectively. Among all circumferential measurements mean Hip circumference is highest 84.85 cm (6.57) and among skin folds Triceps skinfold is 8.98 mm (2.03). According to table mean height increases (7.54) cm progressively from 10 years to 19 years, 8.76 kg weight increases from 10 to 19 years.

Conclusion: Age wise change is shown in this study which proves growth pattern of adolescent period.

Keywords: Puberty; Growth; Anthropometry

Summary

To study growth pattern in adolescence period, anthropometric techniques help in evaluating and monitoring growth spurt for this period by taking socio-economic data and correlation with anthropometry effect of other factors in growth is found.

Introduction

Puberty is vital stage of human growth and life cycle, this stage faces different psychological, physiological changes, it is a stage when individual going towards maturation. For this stage human needs sufficient nutrition; lack of nutrition cause delayed puberty, stunted growth, in female lack of nutrition cause their menarche, if female under nutrition remain in time of their child bearing it effects in child weight, due to under nutrition girl suffers from anemia, [1] puberty occurs in adolescence at this stage; 15% to 25% adult height is completed.

A study on adolescent girls in Nigeria has shown that rural people are more suffering from under nutrition than urban. Growth spurt occurs in girls before 12 and 18 months on set of menarche; median age varies in different population's ranges from 12.5 years.

In Guatemala, median age at menarche is significantly higher in Indian adolescents living in rural areas than in urban areas; lowest age is among the urban, non-Indian Guatemalans. Stunted growth affects work capacity of adolescence. Heavy menstrual blood loss may be an important factor of iron deficiency anemia, Menorrhagia was suspected to be an important contributor to the high rate of anemia (40%) (Table 1).

Age	Nutritional Status					Total
	CEDIII	CEDII	CEDI	Normal	Over weight	
10	18	9	28	45	0	100
11	9	8	18	64	1	100
12	6	8	27	59	0	100
13	2	8	25	65	0	100
14	5	3	15	77	0	100
15	1	2	16	80	1	100
16	0	1	11	86	2	100
17	0	0	7	93	0	100
18	0	0	12	88	0	100
19	0	0	5	104	0	109
Total	41	39	164	761	4	1009

Table 1: Nutritional status.

In worldwide median age at menarche varies from 12.50 to 13.49 years [2]. Weight gain in adolescence gains half adult body weight [3]. A study on family composition and menarcheal age was observed [4].

Data were collected on menarcheal age and family composition from a college population. The mean menarcheal age for total sample was 12.79. Absence of biological father, the presence of half and step

brothers and living in an urban environment were associated with earlier menarche. Body weight and race were also associated with menarche.

To study anthropometric variation during adolescent this research is done. Nutrition will affect growth from infancy to adult hood [5].

Materials and Method

Subject

The study was done on girls of 10-19 years in village Sitarampur, to complete this study different anthropometric measurements were taken. All those girls who participated as subjects and with their consent different measurements were taken.

Height is taken by stadiometre, weight is measured by weighing machine by using Harpenden caliper different skinfolds were measured, waist, chest and hip circumferences were measured by measuring tapes.

Statistical analysis

Data was entered in Microsoft excel 2016 and was analyzed using Statistical software excelstat 19.0

Results

Among all circumferential measurements mean Hip circumference is highest 84.85 cm (6.57) and among skin folds Triceps skinfold is 8.98 mm (2.03). According to table mean height increases (7.54) cm progressively from 10 years to 19 years, 8.76 kg weight increases from 10 to 19 years, All circumferential measurements have increased gradually with advancement of age.

Menarcheal girl's anthropometric data has shown higher value than premenarcheal. Among the study 85.2% are menarcheal girls and this study shows that girls experience highest menarche at age of 12 years, 16.3% girls suffers from CED I, This study shows 4.1% girls belongs to CEDIII. Table shows 30.2% experience of menarche 12-12.9 years.

The overall means, standard deviations of height and weight of the adolescent girls were 150.01 cm (4.81) and 44.06 kg (5.70) respectively.

Among all circumferential measurements mean hip circumference is highest 84.85 cm (6.57) and among skin folds Triceps skinfold is 8.98 mm (2.03).

According to table 4.2 mean height increases (7.54) cm progressively from 10 years to 19 years, 8.76 kg weight increases from 10 to 19 years. In this cross-sectional study it is not known whether girls with earlier onset of menarche had higher body mass and body fat mass than the other girls prior to menarche, or whether these differences were constituted partially or completely after menarche. It shows that menarcheal girls higher weight, height, BMI in comparison with premenarcheal girls. According to overall study 42 of 10-19 are CED I under nutrient. 164 girls are suffering from CED II. 5.87% of Percent Body Fat is increasing from 10 years to 19 years.

Age wise graphical presentation Chest Circumference(cm) Adolescent girls

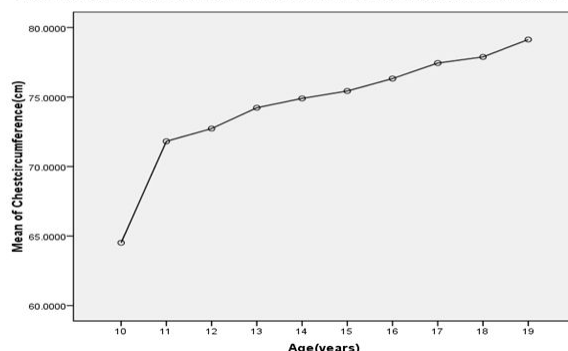


Figure 1: Age wise change in chest circumferences of adolescent girls.

Age wise graphical presentation of waist circumference(cm) of Adolescent girls

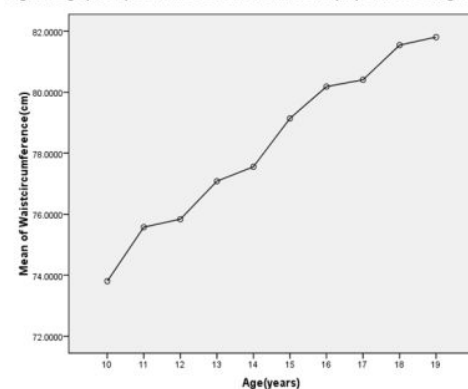


Figure 2: Age wise graphical change waist circumferences of adolescent girls.

Age wise graphical presentation of Hip circumference(cm) of Adolescent girls

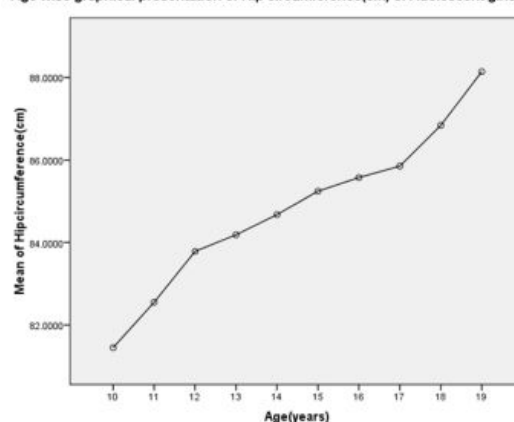


Figure 3: Age wise change in circumferences of hip of adolescent girls.

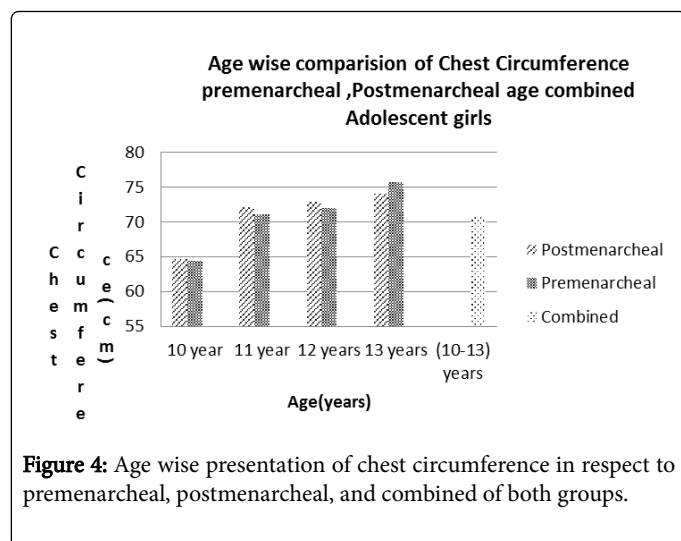


Figure 4: Age wise presentation of chest circumference in respect to premenarcheal, postmenarcheal, and combined of both groups.

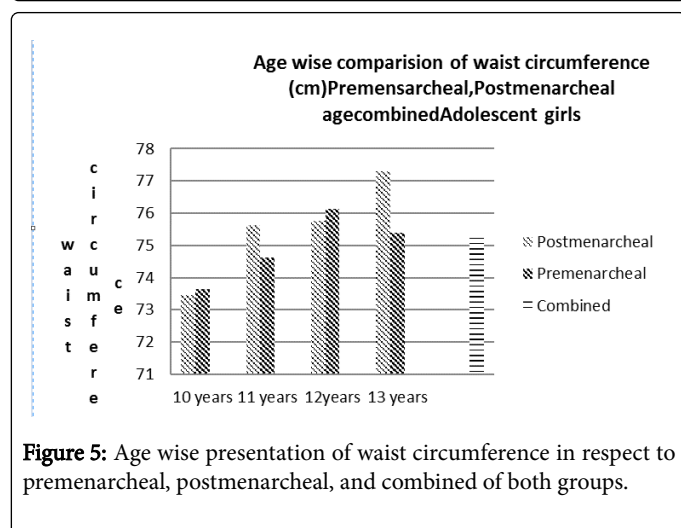


Figure 5: Age wise presentation of waist circumference in respect to premenarcheal, postmenarcheal, and combined of both groups.

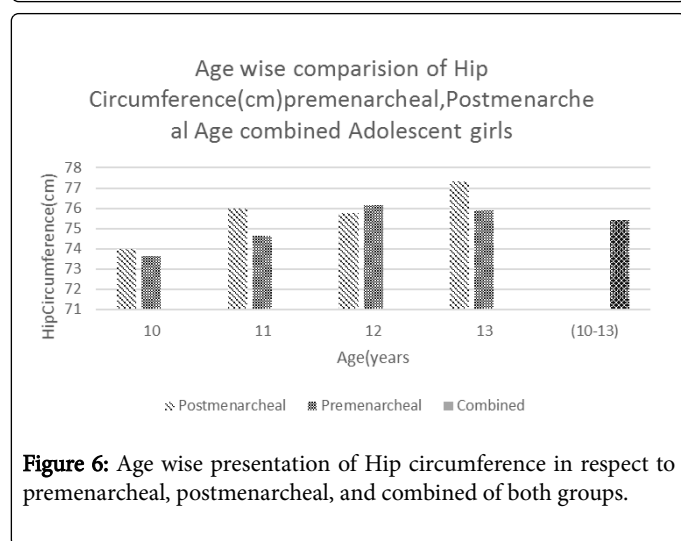


Figure 6: Age wise presentation of Hip circumference in respect to premenarcheal, postmenarcheal, and combined of both groups.

As Body mass Index has increased progressively from 13 years to 19 years of age, but overall increase was (1.89 kg/m²) from 10 to 19 years in age wise change in Mean BMI (kg/m²). (Figures 1-3) represents age

wise changes of growth pattern of study group. Table 1 represents age wise nutritional status of adolescent girls which shows 41 are severely under nutrient (Figures 4-6) shows age wise comparative study of premenarcheal, postmenarcheal, combined graph of study group of different circumferences. Boys are heavier on 16 years onwards. [9].

To attend adulthood it is adolescent major transitional stage [10] [12].

Malnutrition is a silent emergency, and it continues to be a major public health problem worldwide, especially in South-East Asia and sub-Saharan Africa [13]. The health consequences of a prolonged Q2 state of malnutrition among children and adolescents include delayed their physical growth and impair motor and cognitive development, diminished cognitive performance [14,15], Several epidemiological studies have shown an association between physical developments in adolescent period with socio-economic status [16].

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