Journal of Cardiovascular Disease Research

ISSN:0975 -3583,0976-2833 VOL13, ISSUE 05, 2022

Original research article

TANNERS SMR STAGING AND PSYCHOSOCIAL ASSESSMENT OF ADOLESCENT GIRLS

[1]Dr. Sherin Clement, [2]Dr. Dilip Kumar, [3]Dr. Melvin J Gonsalvez, [4]Dr. Nandini RC

[1]Resident, Department of Pediatrics, Dr B.R. Ambedkar Medical Collage, Bengaluru, Karnataka, India

[2]Associate Professor, Department of Pediatrics, Dr B.R. Ambedkar Medical Collage, Bengaluru, Karnataka, India

[3]Assistant Surgeon, Family Health Centre, Vettackal, Department of Health Services, Kerala, India

[4]Assistant Professor, Department of Community Medicine, Dr B.R. Ambedkar Medical Collage, Bengaluru, Karnataka, India

Corresponding Author:
Dr. Nandini RC

Abstract

Children develop secondary sexual characteristics and reproductive competence by a complex process called puberty which is normally originated centrally, with gonadal function being driven by increased gonadotropin-releasing hormone (GnRH) and gonadotropin secretion.5,6 Adolescence is an important stage in the growth and development of girls. There has been a change in sectoral trend in the onset of puberty and menarche which is highly influenced by today's lifestyle which includes both diet, exercise and social factors. All adolescent girls between the age group of 10-17 years coming to OPD or getting admitted in Medical College, were included in the study after taking informed consent. Among 106 study subjects, 71(67%) of study subjects were in pre-pubertal stage and 35(33%) in pubertal stage according to Tanners staging.
According to HEEADSSS approach, 51(48.1%) were normal and 55(51.9%) were having mild psychosocial abnormality.
Keywords: Tanners SMR staging, psychosocial assessment, adolescent girls

Introduction

Adolescence is a period of significant development that begins with the onset of puberty and ends in the mid-20s-a period marking transition from childhood to adulthood. The trajectory between those two ages involves a profound amount of change in all domains of development-biological, cognitive, psychosocial, and emotional [1]. Adolescent age is from 10-19 years. Adolescent stage is divided into early adolescence, middle adolescence and late adolescence. There are three stages of adolescence, which include early adolescence (10 to 13 years), middle adolescence (14 to 17 years) and late adolescence/young adulthood (18 to 21 years and beyond) [2, 3]. 19.6% of Indian population belong to the age group 10-19 years of age. India has the

ISSN:0975 -3583,0976-2833 VOL13, ISSUE 05, 2022

largest adolescent population in the world, 253 million and every fifth person is between 10 to 19 years [4].

Children develop secondary sexual characteristics and reproductive competence by a complex process called puberty which is normally originated centrally, with gonadal function being driven by increased gonadotropin-releasing hormone (GnRH) and gonadotropin secretion [5, 6]. Adolescence is an important stage in the growth and development of girls. There has been a change in sectoral trend in the onset of puberty and menarche which is highly influenced by today's lifestyle which includes both diet, exercise and social factors [7].

The onset of menstruation or menarche is a hallmark of female pubertal development. Menstrual disorders are common among adolescent girls and are a significant source of morbidity in this population. Several environmental factors, status of nutrition in childhood, malnutrition ranging from undernutrition (underweight) to over nutrition (overweight/obesity) affect the regulation of menstrual cycles in females [8].

Adolescence is characterized by an exceptionally rapid rate of growth and is marked by physical and sexual maturation, social and economic independence, development of identity, acquisition of skills needed to carry out adult relationships and roles, and the capacity for abstract reasoning. Nutrition and the adolescent transition are closely intertwined, since eating patterns and behaviours are influenced by many factors, including peer influences, parental modelling, food availability, food preferences, cost, convenience, personal and cultural beliefs, mass media, and body image [1, 9, 10]. The adolescent years are characteristic of changes in body composition (location and quantity of body fat), physical fitness and decreased insulin sensitivity during puberty [11]. This period of growth and maturation is also marked with behavioural changes in diet, physical activity, sedentary behaviour and psychological health [12]. Physical activity and sport participation decline during adolescence especially in teenage girls, while sedentary behaviour, risk for depression and body esteem issues increase during the teenage years [13].

The most important behaviours associated with children's and adolescents' health status are in daily physical activity, spending less than two hours in screen-based sedentary time, having a healthy diet, and abstaining from alcohol and tobacco consumption [14, 15]. Adolescence is an important critical period for individuals to establish enduring healthy behaviours and continuation to adult life and healthy behaviours play an important role for decreased vulnerability and decreased chance for chronic diseases in later life [15-17].

Patterns of behaviour and lifestyle choices that affect both their current and future health are established during adolescence period. Deficiencies in intellectual performance and cognitive development, behavioural and mental problems, obesity and overweight conditions are directly linked with unhealthy eating among young people [9, 15, 17]. Most importantly psychosocial well-being of an adolescent is very important in determining the quality of life. The population of adolescents can be divided into categories based on awareness of ill effects of unhealthy living and does not make any change, the group that is aware of the consequences and are willing to follow a healthy living comprising of diet and exercise. Purpose of this study was to determine the onset of menstrual cycle characteristics of adolescent girls and its relation to Body Mass Index (BMI) and waist hip ratio and tanner's staging.

ISSN:0975 -3583,0976-2833 VOL13, ISSUE 05, 2022

Methodology

Study subjects

All adolescent girls between the age group of 10-17 years coming to OPD or getting admitted in Medical College.

Study design

Cross-sectional study.

Sampling procedure

All adolescent girls between the age group of 10-17 years coming to OPD or getting admitted in Medical College, were included in the study after taking informed consent.

Inclusion criteria

- All school going children belonging to the age group of 10-17 yrs.
- Children belonging to the same area of distribution to avoid the variation in race, lifestyle and ethnicity.

Exclusion criteria

- Any handicapped or physically disabled children.
- Adolescents who have been married at an early age.
- Adolescents with any genetic or predisposing factors.
- Those whose parents are not willing to give consent.

Sample size

According to Gupta and Mishra et al study, considering the prevalence of mild psychosocial abnormality in a community based cross-sectional study on adolescent girls from Chiraigaon Community Development Block of Varanasi District as 40% with a precision of 10% and 95% confidence interval, the sample size is calculated as Adding 10% non-responsive rate, the minimum sample size required for the study is 101. We collected 106 study samples for this study.

Study procedure

All study subjects between the ages of 10-17 years were interviewed to elicit data's regarding their age, class, any chronic illness in the past, previous hospital hospitalization if the child was on any long-term treatment, age of attainment of menarche (in confirmation with the parents). The clinical examination was done to collect data on anthropometry, general physical examination, Tanners SMR staging. Psychosocial assessment was done using a standardized pre-tested questionnaire along with HEEADSSS approach'.

Anthropometric measurement like weight, height and Body Mass Index was measured. Children were asked to stand on the flat floor, with feet parallel and with heels, buttocks, shoulder and back of the head touching the wall. The head was held erect with eyes in the horizontal plane and arms hanging by the sides, the head piece was brought to the top of the head, with the vertical piece flat against the wall and the horizontal piece crusting the hair and making contact with top of head. Measurements

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taken nearer 1cm. Weight was measured using a weighing scale with measurement taken nearest to 0.1 kg.

Results

This study was done among 106 study subjects.

Table 1: Descriptive statistics among study subjects

Descriptive Statistics	Age in years
Mean	13.75
Median	14
Mode	14
Std. Deviation	1.28
Minimum	11
Maximum	17

The mean (SD) age of the study subjects was 13.75(1.28) years. The minimum age was 11 years and maximum age was 17 years.

Table 2: Frequency distribution of age among study subjects

Age in years	**Frequency**	**Percentage**
11	1	.9
12	20	18.9
13	25	23.6
14	29	27.4
15	23	21.6
16	6	5.7
17	2	1.9
Total	106	100.0

Among 106 study subjects, 29(27.4%) belonged to the age of 14 years, 25(23.6%) belonged to 13 years of age, 23(21.7%) belonged to 15 years of age. Majority 77(72.6%) belonged to middle adolescent group (13-17 years).

Table 3: Descriptive statistics of anthropometric measures

	Height	**Weight**	**BMI**
Mean	150.08	43.16	19.11
Median	150.50	42.00	18.91
Mode	150	35	16.4
Std. Deviation	8.04	7.79	3.35
Minimum	127	30	11.48
Maximum	165	70	28.76

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The mean (SD) of height, weight, BMI was 150.08(8.04) cm, 43.16(7.79) kg and 19.11(3.35) Kg/m2. The minimum height was 127 cm and maximum height was 165 cm. The minimum weight was 30 kg and maximum weight was 70 kg. The minimum BMI was 11.48 kg/m2 and maximum BMI was 28.76 kg/m2.

Table 4: Frequency distribution of BMI among study subjects

	Frequency	Percentage
Underweight	10	9.4
Normal	74	69.8
Overweight	18	17.0
Obese	4	3.8
Total	106	100.0

Among 106 study subjects, 10(9.4%), were underweight, 74(69.8%) were having normal BMI, 18(17%) were over-weight and 4(3.8%) were obese.

Table 5: Tanners staging of pubertal development

Tanners Staging	Frequency	Percentage
Prepubertal	71	67
Pubertal	35	33
Total	106	100.0

Among 106 study subjects, 71(67%) of study subjects were in pre-pubertal stage and 35(33%) in pubertal stage according to Tanners staging.

Table 6: Psycho-social scoring according to HEEADSSS Approach

Psycho-Social Score	Frequency	Percentage
Mild risk	55	51.9
Normal	51	48.1
Total	106	100.0

According to HEEADSSS approach, 51(48.1%) were normal and 55(51.9%) were having mild psychosocial abnormality.

Discussion

The main objective of the study is to understand or state the rate of sexual maturation among adolescents of age group 10-19 years with the help of Tanners staging and to assess the psychosocial well-being using the HEEADSS' approach.

The mean (SD) age of the study subjects was 13.75(1.28) years. Another study by

ISSN:0975 -3583,0976-2833 VOL13, ISSUE 05, 2022

Rajachar and Gupta [18] showed that the mean age was 14.16(3.01) years which was similar to our study.

Among 106 study subjects in our study, 29(27.4%) belonged to the age of 14 years, 25(23.6%) belonged to 13 years of age, 23(21.7%) belonged to 15 years of age. Majority 77(72.6%) belonged to middle adolescent group (13-17 years). Rajachar and Gupta showed that 56.1% belonged to early adolescence. Srinivasa *et al*. [19] showed that 28.6% belonged to 15 years of age.

The mean (SD) of height, weight, BMI was150.08(8.04) cm, 43.16(7.79) kg and 19.11(3.35) Kg/m2. Among 106 study subjects, 10(9.4%), were underweight, 74(69.8%) were having normal BMI, 18(17%) were over-weight and 4(3.8%) were obese. Andrie *et al*. [20] found that among 414 adolescents, 54.6% had normal body weight and 45.4% were overweight or obese which was more than our study may be because of higher sample size. Another study by Kubzansky *et al*. [18] found that among adolescents normal weight was found in (48.8%), overweight in (36.7%), obese who become overweight in (3.7%), obese in (9.4%), and severely obese in (1.3%).

Among 106 study subjects, 71(67%) of study subjects were in pre-pubertal stage and 35(33%) in pubertal stage according to Tanners staging. Srinivasa *et al*. [19] showed that majority of girls are in pubertal stage.

According to HEEADSSS approach in our study, 51(48.1%) were normal and 55(51.9%) were having mild psychosocial abnormality. M K Gupta and C P Mishra [21] found that 40.0%, 43.6% and 11.75% study subjects had mild, moderate and severe risk for psychosocial abnormality. Veena Rajachar, Manoj Kumar Gupta [18] Nearly 5% girls were at severe and very severe risk of developing psychosocial abnormalities in both rural and urban study area.

In our study, 90.2% 0f study subjects with pre-pubertal stage as per Tanners staging belong to age group <14 years. 86.2% of study subjects with pubertal stage as per Tanners staging belong to 14-17 years. This was statistically significant. 13(66.7%) of overweight adolescents and 4(100%) of obese adolescents had milder psychological abnormality and this was statistically significant. (p-0.04). 34(84.4%) of study subjects with above average school performance, 17(51.5%) of adolescents with excellent school performance and 19(70.4%) of subjects with good school performance have normal body weight. This was statistically significant.

Andrie *et al*. [20] also found that psychological problems, maternal occupation, the absence of physical activity and poor school performance were associated with adolescent overweight/obesity. Bjertnaes *et al*. [22] found that BMI was positively associated with peer problems indicating that for every point increase in peer problems. Abdel Aziz *et al*. [23] revealed that obese children and adolescents have lower health-related QOL that correlated negatively with BMI, also they are more susceptible to anxiety and depression symptoms than non-obese children. Latty *et al*. [24] found that significant associations existed between BMI and depression, suicidal ideation (combined data), use/abuse of drugs (combined data), race, age, parental marital status, and parental employment status.

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Conclusion

- Among 106 study subjects, 10(9.4%)), were underweight, 74(69.8%) were having normal BMI, 18(17%) were over-weight and 4(3.8%) were obese.
- Among 106 study subjects, 71(67%) of study subjects were in pre-pubertal stage and 35(33%) in pubertal stage according to Tanners staging.
- According to HEEADSSS approach, 51(48.1%) were normal and 55(51.9%) were having mild psychosocial abnormality.

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Accepted on 04/05/2022