

Research Article



A Comparative Study of Daughter and Mother's Menarche Age with their BMI and Socioeconomic Status.

S.Jayakumari, P.Sai kumar, WMS. Johnson, Kalaiselvi*, K. Prabhu, Soundarya
Sree Balaji Medical College & Hospital, No: 7 CLS Works Road. Chrompet. Chennai -600 044, India.
Bharath University, Tamil Nadu. India.

*Corresponding author's E-mail: nisharohan2006@yahoo.co.in

Accepted on: 10-09-2016; Finalized on: 31-10-2016.

ABSTRACT

Menarcheal age is the final manifestation of puberty and is influenced by environmental factors, body mass index, socio economic status, level of education and genetic factors. The purpose of this study is to compare the daughter's menarcheal age with their mother menarcheal age and to analyses their association with body status and socio economic status. After getting institutional ethical clearance and informed consent the study material consists of 288 subjects in the age range from 18-20. For all the subjects question are were given which reflect the menarcheal age, BMI and also their mothers menarcheal age and their BMI. The menarcheal age of daughter range from 10-15 and the average menarcheal age was 12.7 years and their mother menarcheal age range from 12-16 and their age was 13.2 years. In this the early menarche was observed in the present generation. However the data also support the proportion of underweight is higher in the subjects attaining early menarche period. This study also highlight the association of socioeconomic status and changes in life style with the menarcheal age.

Keywords: Menarche age, mother, daughter, BMI , socioeconomic status.

INTRODUCTION

The menarche (the first menstruation) is often considered the central event of female puberty, as it signals the commencement of fertility.¹ Although mensuration is a universal phenomenon, there is a considerable variation among the girls regarding the age of attaining menarche. The menstrual cycle continues until the onset of menopause around age of 50 years. Early menarche age was noticed over a decades in all races. The average age for menarche was observed early between 12 to 13.5 years. In Europe countries the menarche age was found between 11 and 12 years.² At Geneva the mean age of menarche was 12.5 years. In African and American countries the girls were maturing early then white girls.³ In developing countries like Bangladesh and India also early onset of menarche has been noticed.⁴

Hypothalamic - pituitary gonadal axis is coordinated with the menstrual cycles. It is also physiological and pathological changes that occur through life.⁵ It had been suspected that the decrease in the age of menarche due to the improved standard of living. It was calculated that young girls reach the menarche after they develop 17% of body fat as studied by Frisch.⁶

However not only the fat deposition, height, weight and endocrine disrupting chemicals from environmental pollutants are now seriously implicated as major issues.⁷ Various factors and skinfold also play an important role for early menarche. The socioeconomic status is another reason influencing the menarche age. The determination of menarche age is important because an early mensuration leads in to different health related

problems. Till date very little research has been done on early menarche age. With this background the study was designated to compare the daughters menarche age and mother's menarche age.

MATERIALS AND METHODS

To compare the daughter's menarche age and mother's menarche age and also to find the association of their BMI and socioeconomic status, with age of menarche.

In this study 188 medical and 100 nursing adolescents' students were participated from Sree Balaji medical college and Hospital and Sree Balaji Nursing College and Hospital. The study was approved by institutional ethical committee and informed consent was obtained from the participants. The data was collected through interview probing question such as do you remember in which class you were started having first menstrual cycle, to assess the exact age of menarche. Pre - designed confidential questionnaire were prepared to know the height and weight for calculating BMI and socioeconomic status.

RESULTS

Menarche history

Out of the 288 students studied in this study, the menarcheal range from 10- 16, 4 subjects attained at the age of 10, and 35 subjects attained at the age of 11, 57 subjects attained at the age of 12 and maximum pupils attained at the age of 13 and 47 subjects attained at the age of 14 and 17 subjects attained at the age of 15. The average menarcheal age in the daughter group was 12.7 years, the menarcheal age of the students mother range from 11-15, 16 subjects attained at the age of 12, 96



subjects attained at the age of 13, 30 attained at the age of 14 and 27 mothers attained at the age of 15 and the average menarcheal age was 13.2years.

BMI Calculation

The BMI of the students were grouped according to the WHO classification. Those whose BMI was less than 20 (underweight), those between 20 less than 25 (normal), those between 25 and less than 30 (overweight) and those greater than 30 (obese).

In this study those girls attained menarche at the age of **10 years:** out 4 students –25% were under weight, 50% were normal and 25% were overweight. **13 years:** - 15.78% were under weight: 67.36 were normal BMI: 13.68% were overweight: 3.15% were obese. **16 years:** - 100% normal weight. (Shown Table-1)9 students did not mention their height and weight. (Table - I & figure-1)

Table 1: Age at menarche and its BMI level

Age	Underweight	Normal	Overweight	Obese
10	25%	50%	25%	
11	40%	51.4%	2.8%	5.7%
12	41.37%	46.5%	12%	
13	15.78%	67.36%	13.68%	3.15%
14	19.44%	59.72%	11.1%	9.72%
15	35.29%	35.29%	29.4%	
16		100%		

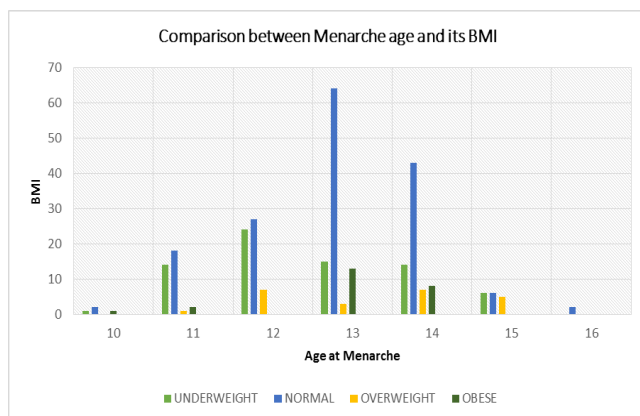


Figure 1: Graphical Representation of Age At Menarche And Its BMI Level

Socio – Economic Status

The socio economic status was calculated based on their family income. 188 girls were belong to the higher economic class and the rest 100 girls belonged to middle class. In high socio economic class 31 girls BMI were underweight 116 were normal 26 were overweight 10 were obese. 5 girl’s data were missing bellowing to the high socio –economic class. (Table- 2, figure -2) The age wise comparison shown in table 2. In middle socio-economic class 42 were under weight, 43 were normal, 8 were overweight and 2 were obese. 4 students they did not mention their height and weight. (Table - 3, figure - 3)In our study it was observed that girls of higher

economic class were found to be with normal weight which could be attributed by the high nutritional diet consumed by them.

Table 2: High socio economic status students compared with their menarche age and their BMI

Age	underweight	normal	overweight	obese
10 years		2		1
11 years	3	21	4	
12 years	8	29	6	3
13 years	8	34	9	4
14 years	8	22	6	1
15 years	3	1		1
16 years		1	1	
Missing data	1	4		

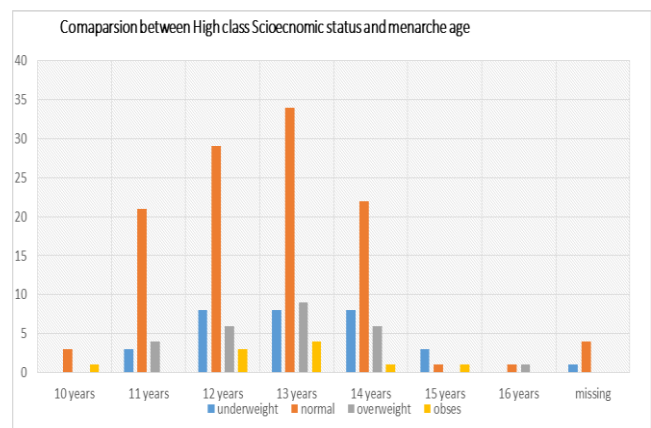


Figure 2: Graphical representation of high socio economic status students compared with their menarche age and their BMI

Table 3: Comparison between middle economic students with their menarche age and BMI

AGE	underweight	normal	overweight	obese
10				
11	1	1	3	
12	5	8		
13	19	18	2	
14	10	15	2	2
15	7	1	1	
16				
Missing data	1	3	1	

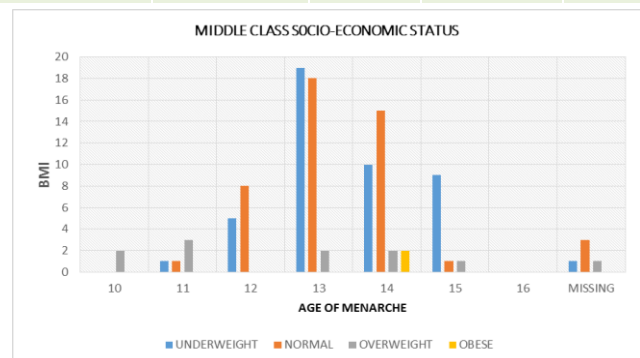


Figure 3: Graphical representation of comparison between middle economic status students with their menarche age and BMI



DISCUSSION

The onset of early menarche is generally much earlier today than in the past, this is due to improved nutrition and junk food. Now a days young girls reaching menarche at early ages of 8 and 9 years-as compared to 12 to 14 years an observation noticed decade ago. While early menarche is now accepted worldwide. The age of menarche may have important health implications in later life of each girl. Experts say early menarche may influence high risk of various diseases like breast and endometrial cancer,⁸ osteoporosis, obesity⁹⁻¹⁰ polycystic ovarian syndrome and spontaneous abortion combined with other risk factors.¹¹ Food habits also may influence early age of menarche. If consuming more junk food and lack of exercise changes the menasural cycle.

Around mid-19th century the age of menarche was first calculated at Denmark. The age at menarche is reported by many authors using different methods.¹² There is no any definition for normal range of menarche age because it depend upon numerous biological factors. Most of the study was undertaken in western region. In this study age at menarche range from 11 to 15 years with the mean of 12.9±1.3 years. Similarly Pooladkhan¹³ reported, the age at menarche was 12.9±1.3years. But Keshavarsi et al¹⁴ observed the age at menarche was between 13.4±07 years. Okasa et al¹⁵ stated that in his study menarche age was positively associated with height and negatively associated with weight and BMI.

In our study also shows those who have over weight (13.68%) and obese (3.15%) attained their menarche in late 13 years.

Abioyekuteyi et al¹⁶ found that upper economic class girls reach their menarche at early age than lower socio economic class. So, our data also suggest that the age of menarche decline down with contractive part.

It was observed that in higher economic class girls only 31 were underweight but in middle class economic girls 39 were underweight. There are no studies to pinpoint a single cause for this worrisome trend, but the general consensus points to childhood obesity. Girls on high-calorie diets become overweight in their early years, and this sudden weight gain causes the reproductive hormones to kick in early. When we ask with their parents' menarche age, we found that most of their mothers' started menstruating only by age 13-14, so it was not a genetic trait but a lifestyle problem.

At the age of 8, the child is mentally not prepared to enter the reproductive stage, and often, they stop whatever little outdoor play activity they engaged in earlier. Even if she manages to lose weight later in life, early menstruation is usually accompanied by early menopause-in the forties.

Girls who reach menarche early, secretion of hormone estrogen at an earlier age. When this is combined with a

late marriage, and the gap between menarche and pregnancy is too long, it ups the risk of cancer that pregnancy is actually a rest break for the ovaries and uterus from the cyclic bombardment of hormonal changes.

In addition, a child who has irregular menstruation that continues into adulthood develops polycystic ovarian disorder (PCOD) due to imbalance in hormones, which often leads to problems conceiving a child. The average age of onset of menses has now come down to 10 years. The earliest symptoms of PCOD, like hirsutism (facial hair) and hyperpigmentation could be emotionally scarring for a teenager.

Apart from fortified and hormone-treated foods, there are also studies linking exposure to inappropriate content in the media, to early mental and physical maturity in girls viewing sexually-explicit material on TV or on the internet could also have an effect on a girl's hormonal status. The female hormones have a strong feedback mechanism from the brain, and when a child views sexual content, it can throw her hormone levels into disarray. Since our children are not educated about sex in the right way, the added confusion and tension over sexual feelings would further cause hormonal surges¹⁵. The age of menarche may have important health implications in late life.

CONCLUSION

The result of this studies shows that age at menarche early when compared to other studies. The result also showed that girls who reached menarche at younger age had lower BMI level or normal BMI level. If we see the socio economic status, among the students of higher economic class student few were underweight but in middle class students more were underweight. This because high class economic status students having high calorie food. Although environmental factors playing an important part and genes are a crucial factor for the early menarche and obesity. Awareness campaigns on life style change may often not taken seriously. Proper nutrition and awareness of physical activity are of prime importance to be addressed to the young adult.

REFERENCES

1. Silvertorn, Dee Unglaub. Human physiology. An Integrated Approach (6thed) Glen view: IL: Pearson Education Inc. 2013, 850-8770.
2. Edward O. Uche - Nwachi,A. Odekunle, Johann Gray, Tanya Bethel, Yonia Burrows, Jennifer Carter, Kirk Christie, John Dillett et al. Mean Age of Menarche in Trinidad and Its Relationship to Body Mass index, Ethnicity and Mothers Age of Menarche. On line Journal of Biological Sciences. 7(2), 2007, 66-71.
3. Anderson S.E, Dallal G.E and Must A. Relative weight and race influence average age of menarche results from two nationally representative surveys of US girls studied 25 years apart. Pediatrics, 111, 2003,844-50.
4. Chandra Prakash, Bhavana, Srivastava, Sanjay Gaur, Renu Bala, Abhishek Rai and Roham. Age of Menarche in Girls of



- Uttarakhand. J Indian Academy Forensic Med. 32(1), 2010, 49-51.
5. Yoshi Ki N, Aso T. The regulation mechanism of the female menstrual cycle. Nippon Rinsho. 55, 1997, 2840-2848.
6. Frisch RE. Body fat, menarche fitness and fertility. Hum Reprod.2, 1987, 521- 533.
7. Colon I, Caro D, Bourdony CJ and Rosario O. 2001. Premature thelarche in Puerto Rico: Natural phenomenon, man- made health catastrophe, or both? Cancer Environ. 6(1), 2001, 1-8.
8. Petridou E, Syrigou E, Toupadaki N, Zavitsanos X, Willett W, Trichopoulos D. Determinants of age at menarche as early life predictors of breast cancer risk. Int J Cancer. 68, 1996, 193-198.
9. Garn SM, La Velle M, Rosenberg KR, Hawthorne VM. Maturation timing as a factor in female fatness and obesity. Am J Clin Nutr. 43, 1986, 879-883.
10. Van Lenthe FJ, Kemper CG, van Mechelen W. Rapid maturation in adolescence results in greater obesity in adulthood: the Amsterdam Growth and Health Study. Am J Clin Nutr. 64, 1996, 18-24.
11. Liestol K. Menarcheal age and spontaneous abortion: a causal connection? Am J Epidemiology (Pediatrics). 111, 1980, 753-758.
12. Freedman DS, Khan LK, Serdula MK, Dietz WH, Srinivasan SR, Berenson GS. The relation of menarcheal age to obesity in childhood and adulthood: the Bogalusa hear study. BMC Pediatric. 2003,3.3.
13. Pooladkhan SH, Valai N. Age and stages of puberty in female students of Kashan in curriculum year 1999 -2000. Kashan University of Medical Science & health services (FEYZ) 11, 2000, 38-45.
14. Keshavarzi F, Azadbar M. The age at menarche and its relation to height, weight, body mass index and socioeconomic state of the middle school student in Kermanshah in 1999. Scientific Journal of Kurdistan university of Medical Sciences. 20, 2001, 23-26.
15. Okasha M, McCarron P, McEwen J, Smith GD. Age at menarche Secular trends and association with adult anthropometric measure. Ann Hum Biol. 78, 2001, 68-78.
16. Agarwal DK, Agarwal KN. Physical and sexual growth pattern of affluent Indian children from 5-18 years of age. Indian Pediatric 29, 1992, 940-949.

Source of Support: Nil, Conflict of Interest: None.

