# Age at menarche and menstrual cycle pattern among school girls in Basrah.

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## ABSTRACT:

**Background**: Menarche is an index of female hormonal, psychological, cognitive changes and physical behavior occurs during puberty, when female become capable to reproduce and it is the first important process of female puberty.Age of menarche has largely decreased in most developed countries in recent decades.

**Methods:** A total of 509 girls were studied by across sectional study which was conducted to investigate age at menarche and menstrual pattern among school girls in Basrah city between Oct. – Dec. 2011.Random selection of school (3 were secondary, 2 were primary schools and only fourth, fifth and sixth class were selected from primary schools), because their age range within age of menarche.

**Results:** Age at menarche was analyzed in 446 schoolgirls taking part in cross-sectional study in Basrah.The analysis yielded mean age of menarche of(11.7+_0.94). About 7.3% of girls experience early menarche below 10 years, 76% of them experience their menarche at 11-12 years of age and 16.7 % were 13years of age and more.Father education level reveal a significant effect on age at menarche, girls whose father had a lower educational level showed a later age at menarche, those who were later born and with big family size had a higher age at menarche and also those with chronic disease. Decrease in age at menarche was found with increase BMI.Variability in menstrual cycle was found with prevalence of irregularity about 72.4% of girls , 54.3% had dysmenorrhea and mean duration of flow was (5.5_+1.6)days.Logistic regression analysis revealed family size and chronic disease were positively associated with age at menarche while present of older girls and family income were negatively associated with age at menarche and other variables had no such association.

**CONCLUSION:**

Findings of current study suggest a change in mean age at menarche over the time which is concurrence with world trend.


**Key words:** Age at menarche, school girls ,Basrah.

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## INTRODUCTION:

Menarche is an index of female hormonal ,psychological, cognitive changes and physical behavior occurs during puberty, when female become capable to reproduce and it is the first important process of female puberty.( 1)The age of menarche varies in different parts of the world; many factors influence the age of menarche which includes, socioeconomic status , nutritional status of girls , genetic and environmental factors .(2),(3) Age of menarche has largely decreased in most developed countries in recent decades (4,5,6) and seems stabilized at 13 -+ 0.5 years. (7) Good nutrition, good socioeconomic status and freedom from disease had declines the age of menarche among different population, , more than two decades ago, in a cancer survey in Saudi Arabia, a difference of 0.4 year in the age at menarche was reported between women born 20 years ago and women born 45 Years ago [8]. Change at age of menarche occurs in Arabian countries With the rapid change in socio-economic status and seems to be similar to the current change at age of menarche among high school students in most western countries such as Italy ,US. Recent reports in western countries suggest that the age at menarche is no longer declining and that it has started to level off [9,10]. Girls with higher social class reach their menarche eleven month earlier than those with lower social class in Basra city 1998. (2)Parent educational level also revealed a significant effect on age menarche, girls whose parents had lower educational level show later age at menarche and those who were later born also had higher age at menarche.(11,12). In tropical countries, sickle cell anemia girls show higher mean age of menarche and this delay in onset of menarche affect the age at first conception of sickle individuals.(11 ) Decline in age of menarche is important because of its potentials impact on early matured girls' behavior (1) which highlights the need to monitor the trends in age at menarche in Basrha and other governorates in Iraq, where lifestyle, socio-economic and dietary factors are rapidly changing. Strategies that should take into account early sexual maturation and its consequences as well as environmental factors that may predispose to early menarche, which concurrence with world trends.(12) The current study done to look for any different between menarche age now and 15 years ago.

### Method and material:

A total of 509 girls were studied by across sectional study which was conducted to investigate age at menarche and menstrual pattern among school girls in Basrah city between Oct. – Dec. 2011.Random selection of school (3 were secondary, 2 were primary schools and only fourth, fifth and sixth class were selected from primary schools), because their age range within age of menarche.After explanation the purpose of the study to the girls, checking height and weight of girls by investigator and then self-reporting questionnaires was distributed among schoolgirls and collected at the same day. The girls have been asked about socio-demographic

characteristic and details about pattern and age when menarche occurred, and any associated symptoms, regularity , duration and menstrual interval, also the girls have been asked about family size, family nutrition, their birth order and their knowledge about physiology of menarche. The body mass index(BMI) was estimated from the equation:BMI{WT(kg)/HI(m)Data were interred into computer and SPSS program was used to analyze the data, $p < 0.05$ considered as significant.

## RESULT:

The age of the girls who were studied ranges between (9 – 20 years) with mean -+ SD of (15.22-+ 2.19 years). Out of 509 girls who were investigated in this study 45 girls did not yet experience their first menstruation at time of interview and they were excluded from the study so 91% experienced their menarche by the time of interview.(table 1)From 464 girls who were included in the study their age at menarche was ranged between (9 – 14) years with mean and SD (11.7 -+ 0.94)(table.1). 34 (7.3 %) of girls experience early menarche below 13 years, 353 (76%) of them experience their menarche at (11 – 12) years of age and 77 (16.7 %) were 13 years of age and more (table2). The data were obtained by the recall method, it might be necessary to conduct more research for accuracy of age at menarche and influential factors.

**Table 1. Characteristic of menstruation among school girls**

| Menstruation characteristic | | Mean +_SD |
|---|---|---|
| Age of menarche | 9-14 years | 11.69 +_ 0.937 |
| Cycle length | 18-35 days | 26.65 +_ 4 |
| Duration of flow | 3-10 days | 5.6 +_ 1.7 |
| Dysmenorrhea | 252 girls | 56.9% |
| irregular cycle | 336 girls | 72.4% |

Table 2. Age of menarche distribution among schoolgirls in Basrha

| Age of menarche | No. | % |
|---|---|---|
| 9-10 | 34 | 7.3 |
| 11-12 | 353 | 76.1 |
| 13y | 77 | 16.6 |
| Total | 464 | 100 |

The onset of menstruation is a part of maturation process, however variability in menstrual was found with prevalence of irregularity was 72.4 % of the girls and54.3 % had dysmenorrhea (table1).The mean duration of flow in our study was (5.5 - + 1.6 days), which is similar to many studies. (Table 1).Parent's educational level and parents occupation also revealed an effect on age at menarche (table 3). Family size and birth order also had effect in age at menarche that big family size and girls who were later born had a higher age at menarche and the association was statistically significant P>0,000.(table 3).Obesity and overweight remind important factors significantly associated with early menarche.Decrease in age at menarche was found with increase BMI of girls and it was statistically significant.(table 3) Families with good nutrition triggers early menarche and this agreement with many studies. (21)Other factors as present of internet and girls knowledge about physiology of menses also trigger earlier menarche. Logistic regression analysis revealed family size and chronic disease were positively associated with age at menarche while present of older girls and family income were negatively associated with age at menarche and other variables had no such association.

**Table 3: Socio demographic characteristic of girls in relation to age at menarch.**

| Variables | Age of menarche (years) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Family size** | **<12** | | **<13** | | **>=13** | | **Total No. (%)** | **P-value** |
| | No. | % | No. | % | No. | % | | |
| <5 | 10 | 29 | 119 | 33.7 | 21 | 27.2 | 146(31.4) | >0.000 |
| 5-8 | 24 | 71 | 198 | 56.3 | 48 | 62.3 | 270(58.1) | |
| 9-12 | 0 | 0 | 28 | 7.9 | 8 | 10.5 | 36(7.75) | |
| >12 | 0 | 0 | 8 | 2.1 | 0 | 0 | 8(1.7) | |
| **Birth order** | | | | | | | | |
| 1-2 | 24 | 71 | 146 | 41.4 | 29 | 37.6 | 199(42.8) | 0.001 |
| 3-4 | 10 | 29 | 126 | 35.7 | 28 | 36.3 | 164(35.3) | |
| 5-6 | 0 | 0 | 67 | 18.9 | 16 | 20.7 | 83(17.8) | |
| >=7 | 0 | 0 | 14 | 3.9 | 4 | 5.4 | 18(3.8) | |
| **BMI** | | | | | | | | |
| >18 | 6 | 17.6 | 84 | 23.7 | 12 | 15.7 | 102(21.9) | 0.000 |
| 18-24.9 | 6 | 17.6 | 185 | 52.4 | 57 | 74 | 248(53.5) | |
| 25-29.9 | 22 | 64.8 | 64 | 18.3 | 8 | 10.3 | 94(20.2) | |
| >=30 | 0 | 0 | 20 | 5.6 | 0 | 0 | 20(4.4) | |
| **Knowledge about physiology of menses** | | | | | | | | |
| Yes | 6 | 17.6 | 123 | 34.8 | 17 | 22 | 146(31.5) | 0.18 |
| No | 28 | 82.4 | 230 | 65.2 | 60 | 78 | 318(68.5) | |
| **Chronic disease** | | | | | | | | |
| Yes | 4 | 11.7 | 6 | 16.9 | 13 | 16.8 | 23(4.9) | >0.000 |
| No | 30 | 88.3 | 347 | 83.1 | 64 | 83.2 | 441(95.1) | |
| **Family nutrition** | | | | | | | | |
| **good** | 20 | 58.8 | 27 | 76.4 | 61 | 79.2 | 351(75.6) | 0.000 |
| **Not good** | 14 | 41.2 | 83 | 23.5 | 16 | 20.8 | 113(24.4) | |
| **Father education** | | | | | | | | |
| >6yr. | 0 | 0 | 6 | 1.7 | 0 | 0 | 6(1.3) | 0.000 |
| 6-9yr. | 0 | 0 | 32 | 9 | 4 | 5.2 | 36(7.8) | |
| 10-12 | 26 | 76.5 | 177 | 50.2 | 48 | 62.4 | 251(54) | |
| >12 | 8 | 23.5 | 138 | 39.1 | 25 | 32.4 | 171(36.9) | |
| **Mother education** | | | | | | | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| >6yr.s | 0 | 0 | 11 | 3.1 | 0 | 0 | 11(2.4) | N.S |
| 6-9yr. | 6 | 17.6 | 61 | 17.2 | 12 | 15.6 | 79(17.1) | |
| 10-12 | 24 | 70.5 | 198 | 56 | 52 | 67.6 | 274(59.1) | |
| >12yr. | 4 | 11.9 | 83 | 23.7 | 13 | 16.8 | 100(21.4) | |
| **Total** | **34** | **7.3** | **353** | **76.1** | **77** | **16.6** | **464** | |

## DISCUSSION:

Menarche is index of female transition period from childhood to adult life and hormonal,psycological,cognitive and physical behavior maturation occurs during puberty when female becomes capable to reproduce .Age at menarche has largely decreased in most developed countries, the decreased age at menarche is important because of its potential impact on early matured girl's behavior. (1)From 464 girls who were included in the study their age at menarche was ranged between (9 – 14) years with mean and SD (11.7 -+ 0.94)(table.1). 34 (7.3 %) of girls experience early menarche below 13 years, 353 (76%) of them experience their menarche at (11 – 12) years of age and 77 (16.7 %) were 13 years of age and more (table2). The data were obtained by the recall method, it might be necessary to conduct more research for accuracy of age at menarche and influential factors.Many explanations were adopted for triggering the onset of menarche, therefore changes and variation in the age of menarche commonly observed and the difference in the menarche age and menstrual cycle pattern might be explained by the difference in socio-demographic status and body fat. The calculated age of menarche in current study is comparable to the age of menarche reported on countries of similar culture and geographical location, the Finding suggests a change in the mean age of menarche over the time which is concurrence with world trend.(3,4,5,6)The presence of decreasing trend with time is an important observation that require periodic revision of health plan, as it was found that in study done (1983) by Al-Thamrery.DM.the mean age at menarche among Iraqi rural girls was 13.6 which is higher than our study.(11)The onset of menstruation is a part of maturation process, however variability in menstrual was found with prevalence of irregularity was 72.4 % of the girls and54.3 % had dysmenorrhea(table1), this abnormality in menstrual cycle consistent with study in Nigeria which was found that early menarche especially between ages of 12-14years to be associated with high frequency of menstrual cycle with prevalence of dysmenorrhea was 76.3 %.(13)and different than that found in Sudan 2011, the cycle was irregular in 25.1% only(1).This irregularity is considered as normal event as ovulation in first two years after menarche is irregular.

(14)Kassala in Sudan had prevalence of dysmenorrhea 44.3 % (1), Ethiopia prevalence of dysmenorrhea was 72 % and a significant numbers of student complain of abnormal menstrual cycle, dysmenorrhea and premenstrual symptom which call for appropriate counseling and management.(15) . In Mexico dysmenorrhea had much lower prevalence 40.4 %. (1)The mean duration of flow in our study was (5.5 - + 1.6 days), which is similar to many studies. (16)Parent's educational level and parent's occupation also revealed an effect on age at menarche, girls whose father had lower educational level showed a later age at menarche and was statistically significant.Family size and birth order also had effect in age at menarche that big family size and girls who were later born had a higher age at menarche and the association was statistically significant P>0,000.this is inconsistent with study in Portugal 2003 which found that family size did not have any significant effect on mean age menarche.Obesity and overweight remind important factors significantly associated with early menarche.Decrease in age at menarche was found with increase BMI of girls and it was statistically significant, this result was consistent with many studies which were found that obesity is a risk factor for early puberty (17, 18). However in other study was found that no difference in age at menarche between women who are vegetarian and those who were eating meat an fish.(19),(20)Girls with chronic disease show a significant association with a higher age at menarche than those free from chronic disease, this result consistent with many studies. (20).Good nutrition, good socioeconomic status and freedom of disease had decline the age at menarche among different population as in England and wales it was dropped from 17 years to 13 years during 100 years up to 1960 (1), and in Portugal that decrease in age at menarche appears as result of the great improvement in social and economic living conditions.Astudy was done by M. al sabak 1998 had estimated that the mean age at menarche among school girls in basrah was 13.63 years (2), which is different of our study 11.69 years, this different in menarchial age probably was expected at past time (1998) because of economic blockade on our country, which could affect different factors as diet, socio-economic status which different than current time, so the BMI was positive factor in decline in age at menarche.Families with good nutrition triggers early menarche and this agreement with many studies. (21)Other factors as present of internet and girls knowledge about physiology of menses also trigger earlier menarche. Logistic regression analysis revealed family size and chronic disease were positively associated with age at menarche while present of older girls and family income were negatively associated with age at menarche and other variables had no such association.

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