Full Length Research Article

ANTHROPOMETRIC AND MENSTRUAL CHARACTERISTICS OF YOUNG IGBO GIRLS IN SOUTH-EAST, NIGERIA


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INTRODUCTION

Background of the Study

Menstruation is a normal physiologic event in females and Menarche is a significant event that marks the onset of sexual maturation in the females. Studies have shown that menarche is variable geographically between cultures, racial and ethnic background; there is therefore a need to evaluate the menarcheal age among females in South Eastern Nigeria, this is important for patient education and for clinical evaluation. There is a wide spectrum of differences on how people may experience menstruation, these differences may cause significant anxiety for patients and their families if not properly understood (Cosgrov et al., 2003). Variations have been documented in menarcheal age of Nigerian subjects ranging from 13.6 years in the North East, 12.53±1.33 in the North West, 13.66±1.82 in the South West and 12.80±1.22 in the South South (Adesina and Peterside, 2013). Differences have also been reported for cycle duration and extent of flow in Nigerian studies (Ikaroha et al., 2005; Jacks et al., 2005; Danborno and Oyibo 2008). There is paucity of data on the menstrual characteristics of young females in South East, Nigeria and Knowledge of which will help reduce menstrual
morbidity, anxiety and increase reproductive health among young females in the South East. Anthropometry involves the study and techniques of measuring the human body in terms of dimensions, proportion and ratios (WHO, 1995; Bruce, 2003; Shetty, 2004). Female anthropometry shows a strong influence on female reproductive characteristics marked by menarcheal age (Reddy et al., 2005). Low et al. (1978) in a study on Chinese girls evaluated the growth of the biacromial and biiliac diameters in relation to the age at the onset of menarche and observed that girls with an early onset of menarche have broader shoulders (biacromial diameter) and wider hips (biiliac diameter) than girls with a late onset of menarche which had broader biacromial and biiliac diameters during their pubertal growth. The study also elucidates that the rate of growth of the biacromial and biiliac diameters are greater in the late menarche girls. There was also a relatively greater growth in biiliac diameter than in the biacromial diameter in the Chinese girls. Danborno and Oyibo (2008) studied Nigerian and Niger girls evaluating their anthropometric and menstrual characteristics and showed that the anthropometric traits in Nigerian girls were higher than that of girls from Niger republic. There is need to evaluate the anthropometric characteristics of young females in South East Nigeria.

**MATERIAL AND METHODS**

**Study Design and Sample Size**

This was a cross-sectional study of 500Igbo girls who attended a youth conference in Akalaliki, Ebonyi state. TheIgbo girls were from five South Eastern Region states of Nigeria which comprise Anambra (n=100) Abia (n=100) Ebonyi (n=100) Enugu (n=100) and Imo (n=100). The subjects were between the ages of 9-25 years old. Demographic data and other relevant data were obtained through a designed questionnaire.

**Anthropometry**

Measurements were taken as follows: body weight was measured to the nearest 0.1kg with An Avery height and weight scale (Avery, Birmingham, England); the subjects were on minimal clothing and without shoes prior to the measurement. Standing height was measured to the nearest 0.1cm with the subject on bare feet. Waist circumference was measured to the nearest 0.1cm with the subject on bare feet. Waist circumference was measured to the nearest 0.1cm with non stretchable tape. The technique employed in taking measurement was in accordance to the guidelines suggested by WHO expert committee (1995).

![Image](308x695 to 353x711)

**Biometric Parameters**

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Abia (n=100)</th>
<th>Anambra (n=100)</th>
<th>Ebonyi (n=100)</th>
<th>Enugu (n=100)</th>
<th>Imo (n=100)</th>
<th>F</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Height (cm)</td>
<td>163.25±6.94</td>
<td>167.68±6.68</td>
<td>160.50±7.28</td>
<td>165.95±4.84</td>
<td>163.90±5.41</td>
<td>19.75</td>
<td>0.000</td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>54.50±8.24</td>
<td>66.30±12.63</td>
<td>55.50±8.50</td>
<td>62.10±7.71</td>
<td>60.75±8.30</td>
<td>28.94</td>
<td>0.000</td>
</tr>
<tr>
<td>BMI (kg/m²)</td>
<td>20.44±2.64</td>
<td>23.52±3.77</td>
<td>21.58±3.22</td>
<td>22.57±2.76</td>
<td>22.63±2.99</td>
<td>14.44</td>
<td>0.000</td>
</tr>
<tr>
<td>Waist circumference.</td>
<td>73.41±7.71</td>
<td>78.87±7.60</td>
<td>75.18±5.85</td>
<td>77.72±10.6</td>
<td>75.69±5.08</td>
<td>8.27</td>
<td>0.000</td>
</tr>
<tr>
<td>Chest circumference.</td>
<td>84.84±7.06</td>
<td>92.08±7.95</td>
<td>87.88±5.88</td>
<td>90.93±9.23</td>
<td>87.25±5.43</td>
<td>16.25</td>
<td>0.000</td>
</tr>
<tr>
<td>Hip circumference.</td>
<td>92.33±11.76</td>
<td>100.46±10.03</td>
<td>91.19±6.4</td>
<td>97.36±9.43</td>
<td>96.65±6.78</td>
<td>17.45</td>
<td>0.000</td>
</tr>
<tr>
<td>Biacromial diameter.</td>
<td>82.42±5.44</td>
<td>92.96±9.22</td>
<td>82.93±5.2</td>
<td>86.74±7.41</td>
<td>87.12±5.94</td>
<td>23.51</td>
<td>0.000</td>
</tr>
<tr>
<td>Biiliac diameter.</td>
<td>71.63±7.9</td>
<td>78.99±9.4</td>
<td>71.12±5.17</td>
<td>74.80±5.5</td>
<td>68.96±14.5</td>
<td>18.24</td>
<td>0.000</td>
</tr>
</tbody>
</table>

**Statistical Analysis**

Data on the menstrual characteristics was obtained by way of questionnaire. The questionnaire contained questions on Menarchal age, pattern of menstrual flow and menstrual disorders such as Amenorrhea, Dysmenorrhea, Menorrhagia, Mittlescherimez and Oligomenorrhea.

**RESULTS**

Table 1. Shows the mean value of the anthropometric parameters of young Igbo girls across the five state of south east Nigeria. There was a significant difference in the Anthropometric parameters (p<0.05) across the five states, the subjects from Anambra had higher mean values. The mean H, W, BMI, WC, CC, HC, BAD and BID of the subjects were 164±6.64 cm, 59.83±10.06 kg, 76.2±7.70 cm, 88.6±7.66 cm, 95.6±9.7 cm, 85.93±7.4 cm and 73.10±9.75 cm respectively. Table 2 Shows the mean menstrual characteristics of Igbo girls across the five states of south east Nigeria. There was a significant difference in the age at menarche and menstrual bleeding days across the five states (p<0.05), there was however, no significant difference in the menstrual cycle. Menarche occurred early in the subjects from Abia and late in the subjects from Anambra.

**Table 1. Anthropometric characteristics of Igbo girls across states of South Eastern Nigeria**

- **BMI** = \( \frac{W}{H^2} \)

Biacromial and biiliac diameters were measured with a sliding calliper as the distance between the most lateral margins of the acromial processes of the scapulae and the distance between the iliac tuberosities respectively. BMI was calculated as weight per height squared.

The technique employed in taking measurement was in accordance to the guidelines suggested by WHO expert committee (1995).
The mean menarcheal age of the subjects in this study was 13.35±1.66 years. The mean menstrual cycle and menstrual bleeding days were 28.46±1.5 days and 4.3±0.69 days respectively. Table 3 shows the incidence of menstrual disorders across the five eastern states. There was a significant difference in the incidence of the menstrual disorders across the five states (p<0.05) except for Amenorrhea. Dysmenorrhea was the most common menstrual disorder and occurred at a prevalence of 65%.

**DISCUSSION**

The findings of this study on the anthropometric characteristics of females in south east Nigeria show that the mean height was 164.25±6.64 cm, which is comparable to the mean height of Nigerian girls earlier reported by Obikili (1992). The mean weight was 59.83±10.06 kg. It was lower compared to other African studies; Adadevoh et al (2007) reported 13.7 years for urban Nigerian girls; Ikaraoha et al (2005) documented 13.89 years for urban girls in Rivers state, South-south Nigeria; Jack et al. (2005) reported 13.6 years for secondary school girls in Borno state, North-east Nigeria and Danborno and Oyibo (2008) documented 13.59±1.58 years for Nigerian girls in Kaduna state, North-central Nigeria. It was however, comparable to Adesina and Peterside (2013) who documented 12.8±1.22. The younger age at menarche reported in this study and that of Danborno and Oyibo (2008) can be attributed to regional/ethnic variation which is probably due to effects of culture, genetics and nutritional status.

More so Danborno and Oyibo (2008) studied female Nigerian subjects in Kaduna north central Nigeria while this present study was in south east Nigeria. It has been documented that human body proportions are affected by ecological, geographical and racial factors (Tanner 1956, WHO 1995 and Agu et al., 2013). Studies have also shown that differences in anthropometric and menstrual characteristics across a population is probably due to nutritional status and possibly is a reflection of the socioeconomic status of the population (Ikaraoha et al., 2005; Singh and Promila, 2009). There was a significant difference in the anthropometric parameters of the subjects across the five south east Nigerian states (p<0.05). The mean values were higher in the females from Anambra compared with other states (Table 1). Anambra is a major commercial center in the south east, it is home to many professionals, merchants and captains of industry; more so, it is believed to have socioeconomic advantage than the other states. The higher anthropometric parameters of the subjects from Anambra may be as a result of socioeconomic factors and possibly suggest that Anamba females may have higher reproductive success. Female Anthropometry has a strong positive correlation with female reproductive characteristics and have been shown to predict higher reproductive success in women (Allal et al., 2004; Reddy et al., 2005; Danborno and Oyibo, 2008). The Mean age at menarche of south eastern Nigerian girls from this study was 13.07±1.69 years, this was however, low compared to the finding of Oduntan et al. (1976), they reported 13.7 years for urban Nigerian girls; Ikaraoha et al. (2005) documented 13.89 years for urban girls in Rivers state, South-south Nigeria; Jack et al. (2005) reported 13.6 years for secondary school girls in Borno state, North-east Nigeria and Danborno and Oyibo (2008) documented 13.59±1.58 years for Nigerian girls in Kaduna state, North-central Nigeria. It was however, comparable to Adesina and Peter side (2013) who documented 12.8±1.22. The younger age at menarche reported in this study and that of Danborno and Oyibo (2008) can be attributed to regional/ethnic variation which is probably due to effects of culture, genetics and nutritional status.

The mean menarcheal age of the subjects in this study was 13.35±1.66 years. The mean menstrual cycle and menstrual bleeding days were 28.46±1.53 days and 4.3±0.96 days respectively. The observed values were consistent with an earlier study by Umeora and Egwatu (2008). There was no significant difference in the length of the cycle however, the menstrual bleeding (flow) significantly varied across the five states. Dysmenorrhea (painful period) was more prevalent and occurred at an rate of 65%, this is in agreement with previous studies. It has been reported to

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**Table 2. Menstrual characteristics of Igbo girls**

<table>
<thead>
<tr>
<th>Area</th>
<th>Mean ±SD Age (years)</th>
<th>Mean ±SD Menstrual Cycle (days)</th>
<th>Mean ±SD Menstrual Bleeding (days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abia</td>
<td>12.70±1.12</td>
<td>28.00±0.89</td>
<td>4.20±0.67</td>
</tr>
<tr>
<td>Anambra</td>
<td>13.40±1.57</td>
<td>28.70±1.53</td>
<td>4.45±0.81</td>
</tr>
<tr>
<td>Ebonyi</td>
<td>13.05±1.82</td>
<td>28.50±1.34</td>
<td>4.55±1.21</td>
</tr>
<tr>
<td>Enugu</td>
<td>12.85±2.16</td>
<td>28.55±1.40</td>
<td>4.05±0.67</td>
</tr>
<tr>
<td>Imo</td>
<td>13.35±1.66</td>
<td>28.46±1.5</td>
<td>4.29±0.95</td>
</tr>
</tbody>
</table>

**Table 3. Menstrual disorders of Igbo girls across the South Eastern States of Nigeria**

<table>
<thead>
<tr>
<th>Area</th>
<th>Fisher’s Exact text</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abia</td>
<td>n=100</td>
<td></td>
</tr>
<tr>
<td>Amorrrhea</td>
<td>6(6.00)</td>
<td></td>
</tr>
<tr>
<td>Dysmenorrhea</td>
<td>4(4.00)</td>
<td></td>
</tr>
<tr>
<td>Menorrhagia</td>
<td>5(5.00)</td>
<td></td>
</tr>
<tr>
<td>Mittelscherimez</td>
<td>15(15.00)</td>
<td></td>
</tr>
<tr>
<td>Oligomenorrhea</td>
<td>0(0.00)</td>
<td></td>
</tr>
</tbody>
</table>

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The mean age at menarche of the subjects in this study was 13.35±1.66 years. The mean menstrual cycle and menstrual bleeding days were 28.46±1.53 days and 4.3±0.96 days respectively. The observed values were consistent with an earlier study by Umeora and Egwatu (2008). There was no significant difference in the length of the cycle however, the menstrual bleeding (flow) significantly varied across the five states. Dysmenorrhea (painful period) was more prevalent and occurred at an rate of 65%, this is in agreement with previous studies. It has been reported to
interferes with daily activities and has also been documented as a leading cause of short-term school absenteeism (Zegeye et al., 2009). It is caused by the release of prostaglandins and leukotrienes in the uterus which cause the uterus to contract.

**Conclusion**

There was a significant difference in the anthropometric characteristics of females across the five states of the south east. The age at menarche varied with state, it occurred early in females from Abia and late in Anambra females. The reported menarcheal age in this study was comparable to a recent study but was however, early compared to the previous Nigerian studies.

**REFERENCES**


Bruce, C. 2003. Anthropometric Indicator measurement guide. Food and nutrition technical Assistance Project. Academy for educational development; Washington DC: 20, 26-29, 70


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