Differences in pattern of menstruation between Kaduna and Rivers State Women of Nigeria

Abstract

Aim: This study was designed to investigate and compare the menarcheal age, menstrual cycle regularity, menstrual flow duration, prevalence of premenstrual syndrome (PMS), and symptoms during menstruation (SDM), in women from Kaduna and Rivers states, Nigeria. **Materials and Methods**: Nonpregnant, nulliparous women from Rivers (n = 401, mean ± SD: 22.55 ± 3.78) and Kaduna (n = 387, mean 22.10 ± SD 2.62) states aged 18-30 years participated in the study. Subjects were randomly selected from some higher institutions in Kaduna and Rivers states. Data were obtained using a self-administered, structured questionnaire. **Results**: The mean age at menarche was higher in Rivers women than in their Kaduna counterparts, but there was no significant difference. The minimum and maximum menarcheal ages for this study were 10 years and 19 years respectively. The results showed that 311 (80.4%) of Kaduna females and 288 (71.8%) of Rivers females experienced regular menstrual cycles; 245 (63.3%) of Kaduna females and 324 (80.8%) of Rivers females experienced a menstrual flow duration of 4-6 days. Most of the study participants experienced at least one premenstrual symptom (Kaduna: 387 or 100%; Rivers: 366 or 91.3%) and one SDM (Kaduna: 36 or; 95.1%; Rivers 397 or 99%); the comparison of PMS and SDM between subjects from the two states showed a significant difference (χ^2 = 35.348, P = 0.000; and χ^2 = 10.637, P = 0.001, respectively). **Conclusion**: A difference was observed between the menstrual patterns of women from Kaduna and Rivers states.

Key words: Menstrual cycle, premenstrual symptom, symptoms during menstruation

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INTRODUCTION

Age at menarche, an important indicator of physiological development in females, is used to assess the developmental status of a pubertal female.[1] A woman's first menstruation is termed menarche and it is an important indicator of maturity.[2] The age at menarche varies widely in different populations and is later, especially in populations with poor nutrition.[3] It has been established that menarche is influenced by factors such as socioeconomic class, sports, and genetic factors.[4] The age at menarche seems to be decreasing in industrialized countries.[5] Before 1900, the average age at menarche in the United States of America was greater than 14 years.[6] This has been attributed to improvements in socioeconomic conditions, nutrition, and general health.[4,5]

Menstruation is often irregular among women of early and late reproductive ages, but its variability among women of midreproductive age remains unclear.[7] The length of a menstrual cycle is least variable in women 20-45 years of age.[8] Menstruation may be associated with various symptoms occurring before or during menstrual flow. A significant number of females complained of dysmenorrhea, and this was more common among older girls with longer bleeding periods.[9] Females experiencing premenstrual syndrome (PMS) have symptoms of depression, and PMS has been linked to depressive disorders.[10] Sleep disturbances also form an important component of PMS. Common sleep-related complaints in patients with PMS include insomnia, hypersomnia, fatigue, nightmares, lethargy, and inability to concentrate.

This study was designed to compare the menstrual patterns of women from Kaduna and Rivers states in the northern and southern parts of Nigeria, respectively.

MATERIALS AND METHODS

This study involved nulliparous female students who were indigenes (both great-grandparents being from the same state) of Rivers and Kaduna states in Nigeria. Rivers state subjects (n = 401) were selected randomly, from Rivers State University of Education and University of Port Harcourt, and Kaduna state subjects (n = 387) from Nuhu Bamali Polytechnic and Kaduna State University. Oral interview and structured questionnaire were used for the collection of demographic data (age and tribe) and menstrual characteristics (age at menarche, duration of menstrual flow, length of menstrual cycle, experiences during the flow, and experiences before the flow). An average of the duration of menstrual flow and length of menstrual cycle for three consecutive cycles was measured for this study.

A menstrual cycle of 21-35 days was considered as a regular menstrual cycle, but one of less than 23 days or more than 35 days was considered irregular.[11,12] Menstrual cycles were grouped into three categories (≤23 days, 24-26 days, and ≥30 days) and the durations of menstrual flow were also grouped into three categories (≤3 days, 4-6 days, and ≥7days).

Ethical clearance was obtained from Ahmadu Bello University Teaching Hospital with an assigned number of ABUTH/HREC/G08/2013.

RESULTS

Significant differences were observed in menarcheal age, regularity of menstruation, and duration of flow (P = 0.03, P = 0.005, and P = 0.000 respectively). A comparison of the menarcheal ages of women from Kaduna and Rivers states is shown in Figure 1. The minimum menacheal age in this study was 10 years (Kaduna: N = 2, 0.6%; Rivers: N = 9, 2.2%), while the maximum was 19 years (Kaduna: N = 2, 0.5%; Rivers: N = 12, 2.9%). At age 15, 80 % (n = 332) of Rivers and 86 % (n = 321) of Kaduna have reached their age at menarche.

Results showed that 311 (80.4%) of the Kaduna females and 288 (71.8%) of the Rivers females experienced regular menstrual cycles [Figure 2]. Study subjects experienced a menstrual cycle of ≤23 days to ≥ 30 days. A majority of the women experienced menstrual cycles of 24-29 days (Kaduna: N = 253, 65.4%; Rivers: N = 270, 67.3%).

Two hundred forty-five (245, or 63.3%) of Kaduna females and 324 (80.8%) of Rivers females experienced a menstrual flow duration of 4-6 days [Figure 3]. A majority of the women had a menstrual flow of 4-6 days, more so Rivers women. Most women who experienced menstrual pain were absent from studies during menstruation [Figures 4 and 5].
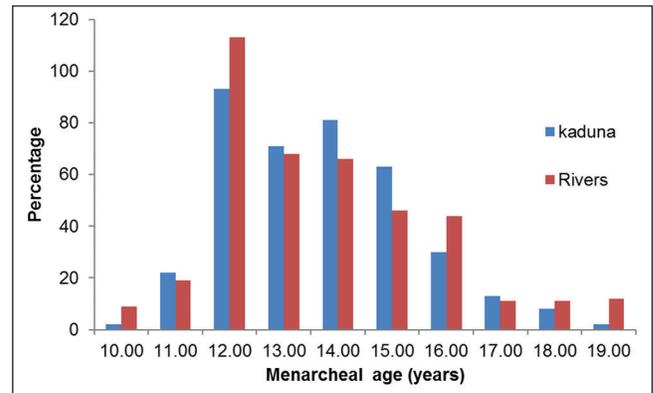

Figure 1: Comparison of menarcheal age between Kaduna and Rivers women. χ^2 = 24.68, P = 0.03
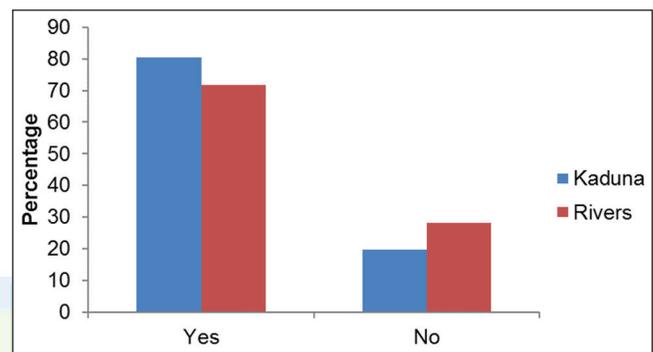

Figure 2: Comparison of average menstrual cycle between Kaduna and Rivers women. χ^2 = 0.491, P = 0.782
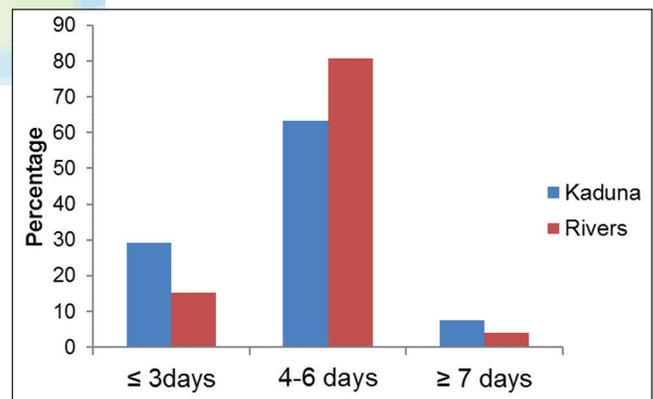

Figure 3: Comparison of duration of menstrual flow. χ^2 = 30.03, P = 0.000

Most study participants experienced at least one premenstrual syndrome [Table 1]. The most frequent observed in this study was pimples and puffy face (Kaduna: N = 192, 49.6 %; Rivers: N = 180, 44.9 %) and the least was increase in appetite (Kaduna: N = 2, 0.5%; Rivers: N = 40, 10 %). The prevalence of PMS was higher among Kaduna women than among Rivers women. A comparison of the symptoms experienced during menstruation (increased breast size - Kaduna: N = 191, 49.4%; Rivers: N = 182, 45.2%) between subjects from the two states showed significant
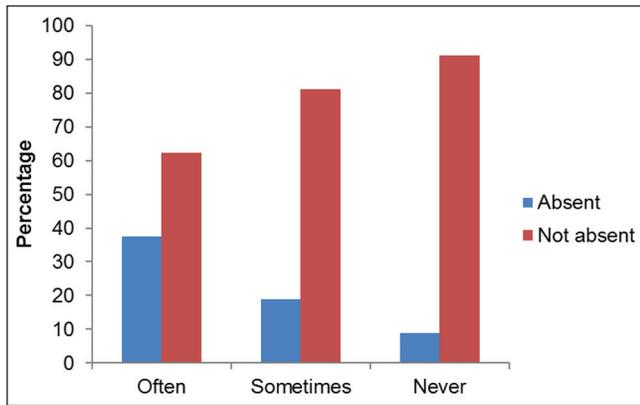
Figure 4: Menstrual pain-related absenteeism among Kaduna women. $\chi^2 = 20.10$, $P = 0.000$
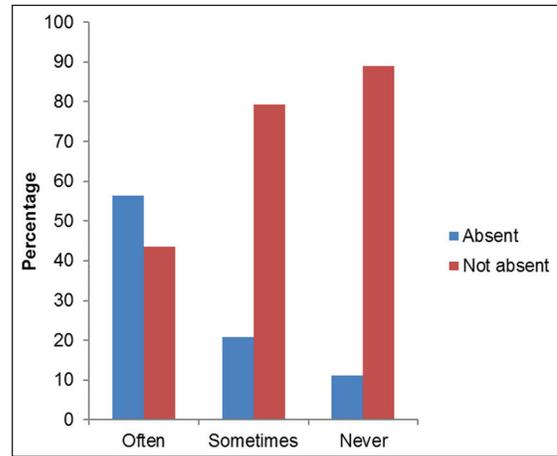

Figure 5: Menstrual pain-related absenteeism among Rivers women. $\chi^2 = 53.147$, $P = 0.000$

In this study, the most common premenstrual symptoms observed were pimples and puffy face. The prevalence of PMS decreased from pimples and puffy face (50% and 45% for Kaduna and Rivers states respectively) to increased appetite (0.5% and 10% for Kaduna and Rivers states respectively).

Table 1: Comparison between the prevalence of PMS in Kaduna and Rivers women

PMS symptoms	Kaduna women (*n* = 387) *n* (%)	Rivers women (*n* = 401) *n* (%)	χ^2	P value
Acting aggressively	37 (9.6)	29 (7.2)	1.25	0.23
Increased appetite	2 (0.5)	40 (10)	0.23	0.60
Pimples and puffy face	192 (49.6)	180 (44.9)	1.94	0.16
Painful breast	126 (32.6)	108 (26.9)	2.28	0.11
Joint pain	43 (11.1)	22 (5.5)	0.03	0.87
Lower abdominal discomfort	157 (40.6)	168 (41.9)	0.13	0.72

Table 2: Comparison of the prevalence of menstrual symptoms between Kaduna and Rivers women

Menstrual symptoms	Kaduna women (*n* = 387) *n* (%)	Rivers women (*n* = 401) *n* (%)	χ^2	P value
Lower abdominal pain	185 (47.8)	168 (41.9)	0.11	0.74
Depression	36 (9.3)	21 (5.2)	0.01	0.91
Anxiety	9 (2.3)	10 (2.5)	0.24	0.62
Nausea	32 (8.3)	13 (3.2)	0.90	0.34
Painful breast	158 (40.8)	143 (35.7)	0.04	0.84
Weakness/tiredness	128 (33.1)	109 (27.2)	1.62	0.20
Feeling heavy	56 (14.5)	57 (14.2)	0.01	0.94
Increased breast size	191 (49.4)	182 (45.4)	7.52	0.01
Back pain	132 (34.1)	37 (9.2)	0.53	0.47
Headache	31 (8.0)	44 (11)	0.61	0.44

difference [Table 2]. The prevalence of SDM experienced decreased from increased breast size to anxiety.

DISCUSSION

In Rivers state of Nigeria (Southsouth Nigeria), the mean age at menarche was 13.89 years for the urban secondary schoolgirls; in Maiduguri (Northeast Nigeria),[13] a mean age of 13.6 years was reported for secondary schoolgirls.[14] From this study, the mean menarcheal age of Kaduna and Rivers women was found to be 13.7 years. The variability of age at menarche is mainly due to genetics, ethnic affiliation, environmental factors, and nutritional factors.[15]

Age 15 was the age at menarche for about 86% of Kaduna women and 80% of Rivers women. In addition, one study[16] posited that tribal difference may contribute to the difference in age at menarche. Therefore, it could be presumed that the difference in menarcheal age observed in Kaduna and Rivers state women in this study could be due to tribal differences, ethnic affiliation, and the nutritional factors of studied subjects.[15,16]

In this study, women experienced menstrual flow of ≤3 to ≥7 days, with 65.4% of the Kaduna women and 80.8% of the Rivers women experiencing a flow of about 4-6 days. The difference in the duration of menstrual bleeding between different ethnic groups could be as a result of variation in any of the following factors: Uterine size and structure, steroid hormone production, uterine sex steroid receptors, and prostaglandin production and sensitivity.[17] Ethnic differences in the timing of pubertal maturation has nothing to do with the duration of bleeding or probability of heavy bleeding.[18] It has been speculated that this variation in

menstrual bleeding pattern reflects differences in the ratio of prostaglandins PGE_2 and PGF_2.[19,20] Some authors reported that the duration of menstrual bleeding of a woman is dependent on her geographical location.[21-23]

Further, some authors have reported that the majority of their subjects experienced bleeding duration of 3-5 days (in Portugal)[24] and 4-8 days.[25,26] Some authors have argued that this difference could be as a result of the difference in methodology.[25,26]

A regional difference in menstrual bleeding characteristics was observed in this study. Data obtained revealed that the Kaduna women experienced both shorter and longer bleeding episodes than did their Rivers counterparts. This marked difference in the length of bleeding episodes could be as a result of significant shift in the population distribution of bleed characteristics.[27] Regional differences in hormone metabolism have been reported by some authors.[28]

Differences in menstrual cycle were observed between Kaduna women and Rivers women. A majority of both Kaduna women (65.4%) and Rivers women (67.3%) experienced a menstrual cycle of 24-29 days. This difference could be attributed to differences in the environment of the subjects: The menstrual pattern of a woman depends on her hormonal status, which is sensitive to environmental influences.[29] Variability in the menstrual cycle length is determined largely by variation in follicular phase length,[30,31] with a shorter cycle reflecting a shorter follicular phase. In this study, fewer women (23.3% Kaduna and 21.2% Rivers) reported a menstrual cycle of less than or equal to 23 days, implying that the number of women with anovulatory cycles in this study was small. Women with a menstrual cycle less than or more than 25-35 days are more likely to have anovulatory cycles[28] and reduced fecundity.[32,33] In addition, one study[34] reported an inverse relationship between short cycle and fecundity.

In this study, menstruation was regular in 80.4 % of Kaduna women and 71.8 % of Rivers women.[35] Reported that women with normal ovulatory cycles are four times more likely to become pregnant than those with irregular menstrual cycle. Kaduna women were found to be likely to have higher reproductive success than Rivers women, as the number of women with regular menstrual cycles in Kaduna was more than that of Rivers. Cycle irregularity in adulthood has been associated with anovulation and infertility.[36,37] Results have also shown that the number of subjects who suffered from irregular menstruation is relatively small (19.6% Kaduna women and 28.2% Rivers women).

In the present study, 91% of all the subjects experienced dysmenorrhea, and 100% of Kaduna women and 91.3% of Rivers women suffered from PMS. The possible reason for the difference in menstrual disorders between the two geographical regions could be as a result of regional differences in hormone metabolism.[28] Painful menstruation was serious enough to affect the daily activities or academic attendance in 24.3% of Kaduna and 29.7% of Rivers undergraduate women, thus causing these women to skip lectures.

In this study, about 90% of the subjects experienced menstrual pains; some experienced pains monthly, while others only sometimes. About 24.3% of Kaduna and 29.7% of Rivers undergraduate women experienced menstrual pain that led to momentary withdrawal from academic work. All the sampled Kaduna women and 91.3 % of Rivers women reported at least one PMS symptom in every menstrual cycle, which was higher than what was reported earlier in Nigeria:[38] reported a prevalence of 85.5 % while[39] reported a prevalence of 72 %. The prevalence of PMS in Ethiopa was 72%,[40] and in India 67 %.[41]

The prevalence of PMS decreased from pimples and puffy face to increased appetite, while one study[16] reported the prevalence of PMS to decrease from lower abdominal discomfort to increased appetite. Regarding the difference in prevalence of PMS, Kaduna women were found to tend to suffer more from symptoms of PMS than Rivers women. The prevalence of discomfort experienced during menstruation decreases from increased breast size to anxiety. On comparing the different prevalence of discomfort experienced during menstruation, Kaduna women were found to tend to suffer more than their Rivers counterparts.

CONCLUSION

Differences were observed in the menstrual characteristics between Kaduna and Rivers women except for the average menstrual cycle. Normal ovulatory cycle (regular menstruation) was of higher prevalence in Kaduna women, implying that Kaduna women are likely to have higher reproductive success than Rivers women. The prevalence of PMS and SDM was higher among the Kaduna women. Height, weight, or body structure had no effect on the age at menarche of women in this study — Rather, choice of diet did.

ACKNOWLEGMENT

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