ORIGINAL ARTICLE

Frequency of Disturbed LH to FSH Ratio in Teenage Girls with Primary Amenorrhea

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ABSTRACT

Aim: To determine the frequency of disturbed LH to FSH ratio in teenage girls with primary amenorrhea.
Study design: It was a descriptive cross sectional study.
Place of study: Department of Obstetrics & Gynaecology, Jinnah Hospital, Lahore.
Duration: From 20th April 2014 to 20th October 2014.
Method: In this study, a total of 190 girls between 13-19 years of age presenting with primary amenorrhea were included in the study through OPD of Department of Obstetrics and Gynecology, Jinnah hospital, Lahore while married girls, already taking hormonal treatment, and all the patients having history of radiotherapy or chemotherapy in early childhood due to malignant diseases were excluded from the study. All girls were advised serum LH and FSH from Pathology Department of the hospital. Biomeriux enzyme immunoassay (EIA) kits were used for hormonal tests. LH/FSH ratio was then calculated and noted. Disturbed LH/FSH ratio was labelled.
Results: In our study, out of 190 cases, 96(50.53%) were between 13-16 years of age and 94(49.47%) were between 17-19 years of age, mean$\pm$sd was calculated as 16.23$\pm$2.03 years of age. Mean values of hormones of the cases were calculated as 8.29$\pm$1.18 for LH and 8.54$\pm$1.31 for FSH and 1.35$\pm$0.65 for LH/FSH ratio. Frequency of disturbed LH to FSH ratio in teenage girls with primary amenorrhea was calculated as 15(7.89%) while 175(92.11%) had no findings of disturbed LH to FSH ratio. **Conclusion:** We concluded that the frequency of disturbed LH to FSH ratio is not significantly higher among teenage girls with primary amenorrhea.
Keywords: Primary amenorrhea, teenage girls, disturbed LH to FSH ratio

INTRODUCTION

A complex hormonal interaction is essential in order for normal menstruation to occur.[1] Monthly menstruation is an obvious marker that the various levels of interaction between hypothalamus, pituitary, ovary and uterus are functional. Interruption of this axis at any point leads to amenorrhoea.[2] Primary amenorrhea is defined as the absence of menses by 13 years of age when there is no visible development of secondary sexual characteristics or by 15 years of age in the presence of normal secondary sexual characteristics or no menstruation within 2 years of the breast development (Tanner stage 2)[1].

The presence of primary amenorrhea is of great concern to gynecologists as this represents a confusing and difficult dilemma encompassing congenital malformations, genetic defects, metabolic derangements, selective anterior pituitary failure, and occasionally malignant tumors.[3] Causes of primary amenorrhea should be evaluated in the context of the presence or absence of secondary sexual characteristics which develop as a result of endocrine maturation at puberty and are development of breast, pubic and axillary hair, growth spurt and onset of menstruation[4].

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When secondary sexual characteristics are normal, the underlying causes of primary amenorrhea could be outflow tract obstruction, resistant ovary syndrome, polycystic ovarian syndrome, androgen insensitivity and constitutional delay. In the absence of secondary sexual characteristics, primary amenorrhea could be due to hypothalamic pituitary dysfunction and ovarian failure. Heterosexual development could also lead to amenorrhoea.[5] Although amenorrhea may result from a number of different conditions, a systematic evaluation including a detailed history, physical examination, and laboratory assessment of selected serum hormone levels can usually identify the underlying cause[6].

This study was planned to determine the frequency of altered LH to FSH ratio in girls of age group 13-19 years with primary amenorrhea as literature reveals that disturbed hormonal profile among teenage girls is main cause of primary amenorrhea but controversial results are also present in literature. Amenorrhea is growing common problems among teenage girls and mostly mothers or girls do not concern to determine the cause of amenorrhea. This may be due to controversy in results. Through this study we want to confirm the frequency of disturbed LH/FSH ratio among teenage girls presenting with primary amenorrhea. This may

help to improve our practice and guideline to facilitate the diagnosis of disturbed LH/FSH ratio and develop expertise for its better management.

MATERIAL AND METHODS

A total of 190 girls aged 13-19 years presenting with primary amenorrhea were included in the study while married girls, already taking hormonal treatment, all the patients having history of radiotherapy or chemotherapy in early childhood due to malignant diseases and patients with normal secondary sexual characteristics but absent uterus on ultrasonography and with outflow tract obstruction were excluded from the study. These cases were enrolled from OPD of Department of Obstetrics and Gynecology, Jinnah hospital, Lahore. Written informed consent was taken. Demographic profile (name, age, height, weight and BMI) was also noted. History and examination was done by the researcher herself. Then all girls were advised serum LH and FSH from Pathology Department of the hospital. Biomeriux enzyme immunoassay (EIA) kits were used for hormonal tests. LH/FSH ratio was then calculated and noted. Disturbed LH/FSH ratio was labeled (as per operational definition). Data was collected on especially designed proforma attached hereby.

We used SPSS version 16.0 was used for data entry and analysis. Descriptive statistics included mean and standard deviation of continuous data like Age, Height, Weight, BMI and LH/FSH ratio level. Frequency and percentages were calculated for categorical data like disturbed LH/FSH ratio and presented in the form of tables.

RESULTS

Age distribution of the patients was done which shows that 96(50.53%) were between 13-16 years of age and 94(49.47%) were between 17-19 years of age, mean±SD was calculated 16.23±2.03 years of age (Table 1).

Mean characteristics of the patients reveal 4'.4"±1.06 height of the patients, 40.34±4.67kgs weight and 21.32±2.59kg/m^2 BMI (Table 2).

Mean values of hormones of the cases was calculated as 8.29±1.18 for LH and 8.54±1.31 for FSH and 1.35±0.65 for LH/FSH ratio (Table 3).

Frequency of body weight of the patients was calculated as 24(12.63%) were under weight, 129(67.89%) had normal weight while 17(19.48%) were overweight (Table 4).

Frequency of disturbed LH to FSH ratio in teenage girls with primary amenorrhea was calculated as 15(7.89%) while 175(92.11%) had no findings of disturbed LH to FSH ratio (Table 5).

Table 1: Age distribution (n=190)

Age (in years)	**n**	**%age**
13-16	96	50.53
17-19	94	49.47
Total	190	100
mean±sd	**16.23±2.03**	

Table 2: Mean characteristics of the cases (n=190)

Characteristics	**Mean**	**SD**
Height	4.4	1.06
Weight	40.34	4.67
BMI	21.32	2.59

Table 3: Mean LH/ FSH (n=190)

Hormones	**Mean**	**SD**
LH	8.29	1.18
FSH	8.54	1.31
LH/FSH	1.35	0.65

Table 4: Frequency of body weight of the patients (n=190)

Body weight	**n**	**%age**
Under weight	24	12.63
Normal weight	129	67.89
Over weight	37	19.48
Total	**190**	**100**

Table 5: Frequency of disturbed LH to FSH ratio in teenage girls with primary amenorrhea (n=190)

Disturbed LH to FSH ratio	**n**	**%age**
Yes	15	7.89
No	175	92.11
Total	190	100

DISCUSSION

The findings of our study are in agreement with a study conducted in Faisalabad where the frequency of disturbed LH/FSH ratio (PCOD) was observed only in 6.3% of girls with primary amenorrhea[8].

Another study conducted in Rawalpindi reported that 52% of girls with primary amenorrhea had raised LH/FSH ratio (Polycystic Ovarian Disease) while 82.7% girls had disturbed LH/FSH ratio. It was concluded that PCO, a common problem of females of reproductive age group is affecting their life physically, mentally and socially[7]. Our findings are in contrast with the findings of our study, the difference may be due to the reason that in the above study overweight girls were 34(65%), while in our study only 19.48% of the girls were overweight.

In one study conducted in Paediatric and Adolescent gynaecology clinic, Hong Kong, by PW Chung in 2011, polycystic ovarian disease (PCOD) was found in 7% of primary amenorrhoeic patients[9] which is almost similar to our study (6.3%). This study was conducted on adolescents aged 14-19 years almost the same age group as in this study.

The study conducted in Division of Yoga and life sciences, SVYASA university, Bangalore, India by Nidhi R in August 2011 showed that 29(6.3%)girls of age group 15-18 years presented with oligomenorrhoea and polycystic ovarian syndrome ,while in this study primary amenorrhoea was associated with polycystic ovarian syndrome in the same age group[10].

However, most of the studies are in agreement with the findings of our study. Our results are helpful for improving our practice and guideline to facilitate the diagnosis of disturbed LH/FSH ratio and develop expertise for its better management.

CONCLUSION

We concluded that the frequency of disturbed LH to FSH ratio is not significantly higher among teenage girls with primary amenorrhea.

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