



COMPARISON OF EFFECT OF DIFFERENT PHASE OF MENSTRUAL CYCLE ON PULMONARY FUNCTIONS IN NORMAL & OVERWEIGHT YOUNG GIRLS

Physiotherapy

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ABSTRACT

Introduction: The dynamic cyclical changes in the levels of various hormones during different phases of menstrual cycle are known to affect functioning of the respiratory system. Studies suggest that progesterone and estrogen levels strengthen the respiratory musculature and increase the relaxation of bronchial smooth muscles. This variation has been cited as the cause of change in lung functions during various phases of menstrual cycle.

Aim: To find out the effect on pulmonary functions during different phase of menstrual cycle.

Methodology Patients who fulfil inclusion criteria were selected. The 30 female subjects of age between 18 – 25 years were included. Girls were divided into two groups: Group 1 (BMI = 18-22 kg/m²) [according to Asian scale], Group 2 (BMI = 23-26.9 kg/m²). Data of all the subjects were acquiring in the following two phases of menstrual cycle: Menstrual phase & Secretary Phase. These days were calculated from LMP dates. Subjects were asked to report two times on the 2nd or 3rd and between 20th-22nd days of menstrual cycle.

Result: All parameters of pulmonary function were insignificant except PEFR of secretary phase.

Conclusion: There is no change in pulmonary function due to higher BMI in overweight compare to normal.

KEYWORDS

pulmonary function test, menstrual phase, secretary phase

INTRODUCTION

The normal reproductive years of the female are characterized by monthly rhythmical changes in the rates of secretion of the female hormones and corresponding physical changes in the ovaries and other sex organs¹.

Menstrual cycle occurs in three phases: Menstrual, proliferative and secretary phase, which are regulated by sex hormones: estrogen, progesterone¹. Role of progesterone is in increasing the respiration by stimulating central controlling mechanism of respiration².

Studies suggest that progesterone and estrogen levels strengthen the respiratory musculature & increase the relaxation of bronchial smooth muscle³. Some studies also showed association of lung function values with BMI^{4,5}. The present study is an attempt to evaluate the effects of different phases of menstrual cycle on pulmonary function tests & to correlate pulmonary function tests with the body mass index (BMI)

METHOD AND MATERIALS

- Healthy young girls of age 18-25 years with normal BMI and overweight no other co-morbidities were selected for the study. Subject who have history of irregular menstrual cycle, Subject on oral contraceptive pills, hormone replacement therapy, History of known chronic obstructive pulmonary disease and restrictive lung disease, History of known cardiovascular illness, hypertension and psychiatric illness, History of smoking, alcohol addiction or medication were excluded from the study.

An oral consent was taken from the participants and detailed explanation of the study was given.

Data of all the subjects were taken in the following two phases of menstrual cycle: Menstrual phase & Secretary Phase. These days were calculated from LMP dates. Subjects were asked to report two times on the 2nd or 3rd and between 20th-22nd days of menstrual cycle.

The pulmonary function test taken according ATS guidelines and the parameters like FVC, FEV1, FEV1/FVC, PEFR Would be recorded by computerized spirometer (Helios 401 version :1.0)

In the maneuver each subject was motivated and encouraged to give her best performance.

RESULT

Data (mean ± SD) was analyzed using statistical software SPSS v-16. between group comparison was done by nonparametric in depend sample Mann Whitney u test.

The Wilcoxon's sign rank test was used for intra group comparison of two phases

MENSTRUAL PHASE

Variable	G-1	G-2	U value	P value
Fvc	85.3	94.8	74	0.1
Fev1	102.1	111.4	93	0.4
Fev1/fvc	120.1	117.1	74.5	0.1
Pepr	76.5	88.7	72	0.09

SECRETORY PHASE

variable	G-1	G-2	U value	P value
Fvc	91.8	102.6	67.5	0.06
Fev1	108.8	120.8	73	0.1
Fev1/fvc	118.8	115.4	91.5	0.3
Pepr	78.7	96.6	60	0.02

DISCUSSION

In this study the result suggested that in group -2 there is higher mean of different parameters of PFT compare to group -1 during menstruation.

In our study forced vital capacity & forced expiratory volume values were higher in overweight than the normal. This is against the findings obtained by Satya Narayana P et al who found negative correlation of these parameters with increasing BMI.⁵

The reasons of our finding may be that these subjects were not frank obese and the number in this group was less, only 15 subjects were there in this pre-obese group. One of other reasons may be that overweight girls generally have increased fat in their lower extremities rather than on abdomen and thorax which would have direct effect on diaphragmatic movement making lung function values diminished.⁶ but there is significance of peak expiratory flow rate in secretary phase.

Present trends in forced vital capacity values partially matched with the results of Hebbar KR their values of forced vital capacity were also higher in secretary phase as compared to menstrual phase but values of forced vital capacity in follicular phase were less than in menstrual phase.⁷

CONCLUSION

Higher values of lung functions during proliferative and secretary phases can be attributed to the higher concentrations of sex hormones specially progesterone because in most of the studies progesterone is known to cause relaxation of bronchial smooth muscle. Because of

increased fat distribution in the lower extremities other than thorax & abdomen, there is no change in pulmonary functions in higher BMI in young girls.

Limitation of study: small sample size

Future scope: PFT can be measured in all three phases of menstruation. It also can be measured with different BMI.

Clinical implication: we can advise all type of breathing exercise during the menstrual cycle to maintain the lung volume.

REFERENCES

1. Manish goyal,s.k. dwivwdi,ajit Singh rajput. effect of different phase of menstrual cycle on lung functions in young girls of 18-24 years of age, indian journal.2017 feb, 5(2);612-618.
2. Das TK. Effects of the menstrual cycle on timing and depth of breathing at rest. Indian J Physiology Pharmacol.1998;42(4):498-502.
3. Dabhoiwala S, Kathrotia R, Patel D. Pulmonary functions in different phases of menstrual cycle and its relation with serum progesterone levels. National J Integrated Res Med.2011;2(4):39-42.
4. Shah HD, Shaikh WA, Patel D, Singh SK. Dynamic lung functions in underweight Gujarati Indian adolescent boys. National J Community Med. 2012;3(1):142-5.
5. Ghobain MA. The effect of obesity on spirometry tests among healthy non-smoking adults. BMC Pulmonary Med.2012;12:10.
6. Satyanarayana P, Roy M, Parmar C. Assessment of Lung functions in obese young adolescent medical students. IOSR J Dental Med Sci.2014;13(5):17-20.
7. Hebbar KR. Comparative Study of pulmonary function tests in women in different phases of menstrual cycle with and without contraceptive pills. IOSR J Dental Med Sci. 2013;8(5):21-5.