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INTRAOcular PRESSURE CHANGES DURING FOLLICULAR AND LUTEAL PHASES OF MENSTRUAL CYCLE

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ABSTRACT

During the period of menstruation, pregnancy and menopause which may be accompanied by eye a manifestation which is disturbing nature in women. We observed the changes in intraocular pressure occurring during various phases of menstrual cycle. In this study, 50 menstruating women were studied. To study the effect of menstruation, in 50 female volunteers, IOPs were measured after every 6th day of menstrual cycle and till end of menstrual cycle. The present study showed, there was a increase in intraocular pressure in follicular phase compared to the luteal phase. There was less significant in intraocular pressure changes with BMI.

KEYWORDS: Menstrual Cycle, Intraocular Pressure (IOP), Schiotz Tonometry.

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INTRODUCTION

The period of menstruation, pregnancy and menopause is frequently accompanied by eye manifestations of a disturbing nature in women. The menstrual cycle occurs in three phases; menstrual, follicular and luteal which are regulated by the sex hormones, estrogen, progesterone from the ovary and also gonadotropins, luteinizing hormone and follicle stimulating hormone from anterior pituitary. The level of these hormones fluctuates predictably across the menstrual cycle in naturally cycling eumenorrhoeic women^{1,2}. The relationship between days of the menstrual cycle and variations in intraocular pressure findings are not consistent, although previous studies have demonstrated that intraocular pressure decreases during pregnancy and as compared to menstruating women, it is higher in post menopausal women but the degree of the reported change in intraocular pressure values differ from study to study^{3,4}. During menstruation there is frequently accompanied by eye manifestations in women who appear to be normal in all other aspects. Evidence has been accumulating for some time now which shows that during the menstrual cycle. There is a similarity have also been brought out between closed angle glaucoma and premenstrual migraine. In this aspect, we have observed that there is some changes in intraocular pressure occurring during various phases of menstrual cycle⁴.

MATERIALS AND METHODS

In this study, 50 menstruating women were studied. To study the effect of menstruation, in 50 female volunteers, IOPs were measured after every 6th day of menstrual cycle and till end of menstrual cycle. The patients who have attended the department of ophthalmology in Sri Lakshmi Narayana institute of Medical

Sciences, were included in the study. The study was undertaken between February 2013 to November 2013. Informed consent was taken from the volunteers to check the intraocular pressure. Intraocular pressure was performed using Schiotz tonometer in the Ophthalmology department of SLIMS. The cost of the test was borne by the investigator and the concerned department. Almost all the subjects to this study came from a comparable socioeconomic background. Before the starts of the study, the protocol was approved by the ethical clearance committee of SLIMS, Puducherry. For the study group, ages between 14 to 45 years of 50 menstruating women were included. The subjects with refractive errors, irregular menstrual cycle and any pre-existing endorinal disorders were excluded from this study. Before recording IOP the following parameters were recorded like age, weight, and Body mass index, blood pressure and social status.

Procedure

Before performing the procedure the hands should be washed and kept dry. Instill add two drops of local anesthetic and wait for 30 seconds. Ask the patient to look at affix object and to keep absolutely still. With the thumb and the index finger of one hand, gently hold open the patients eyelid taking care not to put any pressure on the eyes. With the other hold the tonometer between the thumb and index finger and place the plunger on the central corneal surface and note the scale reading. Then clean and dry the tonometer ahead. Repeat the procedure for the other eye also. IOP is very much influenced by the corneal thickness and rigidity as already stated. Difference in pressure between two eyes is often clinically significant and potentially with certain types of Glucoma.

IOP = F/C + PV
 Where, F = Aqueous Fluid Formation Rate
 C = Outflow
 PV = Episcleral Venous Pressure.

Statistical Analysis

Method used to study the intraocular pressure in different phases of menstruation was ANOVA (Analysis of Variance).

RESULTS

The present study showed, there was a increase in intraocular pressure in follicular phase compared to the luteal phase (Table I). There was less significant in intraocular pressure changes with BMI (Table II).

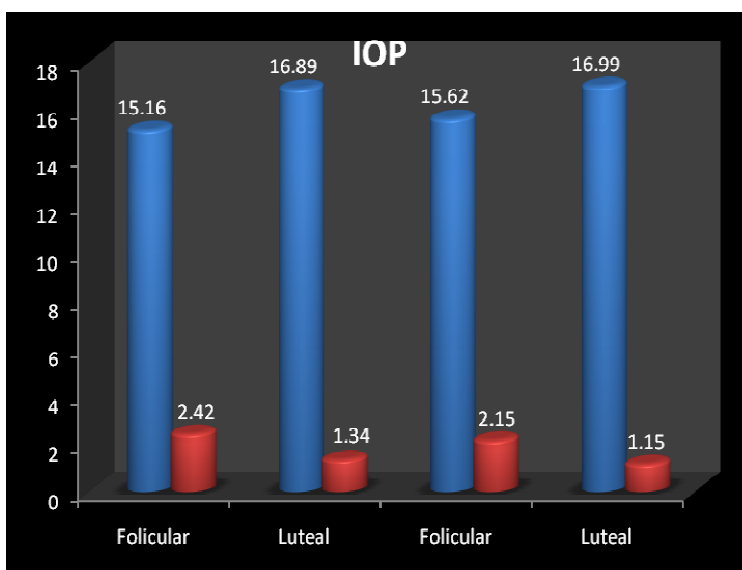
Table I
IOP Changes during Follicular and Luteal Phase of Menstrual Cycle.

IOP	Group	No. Of Subjects	Mean	Std. Deviation	t value	P value
RE	Follicular	25	15.160	2.4273	-3.123	0.003***
	Luteal	25	16.892	1.3413		
LE	Follicular	25	15.628	2.1542	-2.819	0.007***
	Luteal	25	16.996	1.1542		

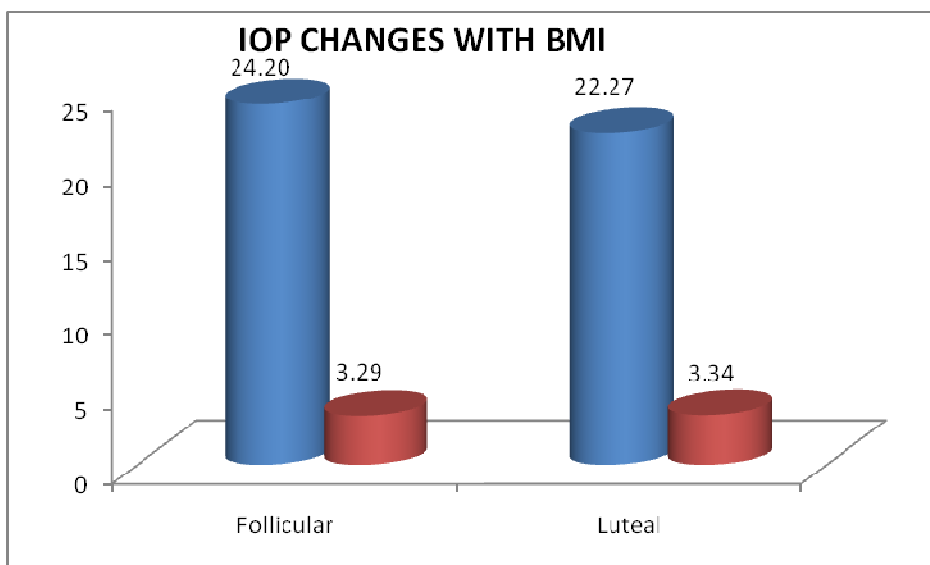
Tale II
IOP changes With BMI

Group	No. Of Subjects	Mean	Std. Deviation	t value	P value	
BMI	Follicular	25	24.2052	3.29177	2.057	0.045
	Luteal	25	22.2760	3.34082		

Graph I
Comparison of the IOP in the Follicular and Luteal Phase



Graph II
Comparison of BMI with IOP



DISCUSSION

The female sex hormones are the predominant ones to cause variations in intraocular tension. Dalton, mentioned in his study, a rise of intraocular tension in the menstrual phases of the cycle. Veena misra, Awasthi studies shows, the intraocular tension variation during the course of the menstrual cycle. Qureshi, Nusrat pasha, in their reports the IOP changes with the days of menstrual cycle. The results of the present study are different from previous studies done by Paterson, Bankes and Saivati⁵⁻⁹. Bankes et al found that the lowest mean IOP coincided with the luteal phase (21st to 24th day), while the highest occurred from the follicular phase (from 9th to 12th days). Saivati noted an increase in IOP during menstruation. Dalton noted an increased incidence of glaucoma and elevated IOP in female patients just before and during menstruation⁵⁻⁸. The cyclic changes in estrogens and progesterone during the menstrual cycle are well documented. The peak of IOP occurred from the 12th to 15th day, may be because of ovulation. During this phase Luteinizing hormone (LH) is necessary for ovulation

process. the rate of secretion of LH by the anterior pituitary gland increases markedly, rising six to tenfold and peaking about 16 hours before ovulation. So, LH plays a role in physiologic regulation of IOP. Therefore, the present study suggests to see the effect of LH on IOP^{10,11}. However, the most common type of glaucoma is primary approximately nearly or over 50 years higher frequency in women than in men^{12, 13, 14}. Others reported that an increase in BMI in women play a great role hormonal changes^{14, 15}.

CONCLUSION

We conclude that, Intraocular pressure varies in menstrual cycle, there was a significant increase of intraocular pressure in follicular phase compared to the luteal phase. This variation is significant it will help in the screening of glaucoma. So, further research is needed in the area of study to improved understanding of Pathophysiology of Ocular diseases in menstrual cycle.

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