INTRODUCTION

The period of pregnancy is frequently accompanied by eye manifestations of a disturbing nature in women who appear to be normal in all other aspects. (Mishra Vet al., 2012) The normal reproductive years of the female are characterized by monthly rhythmical changes in the rates of secretion of the female hormones and the corresponding physical changes in the ovaries and other sexual organs.

Pregnancy is the physiological phenomenon beginning with fertilization and ending at birth. Pregnancy is divided into three periods called trimester. Each trimester is about 3months duration. Pregnant women undergo a tremendous number of changes both systemic and ocular throughout the pregnancy.

Earlier studies have concentrated more on last trimester of pregnancy Here we have focused on all the three trimesters of pregnancy and the changes in intraocular pressure is noted meticulously.

AIM and OBJECTIVE

This study was done to observe and analyze changes in intraocular pressure during pregnancy.

INTRAOCULAR PRESSURE

The intraocular pressure refers to the pressure exerted by intraocular fluids on the coats of the eyeball. The normal intraocular pressure varies between 10 and 21mmHg. The normal level of IOP is essentially maintained by a dynamic equilibrium between the formation and outflow of the aqueous humour. Aqueous humour is a clear liquid that nourishes the cornea and lens is produced in the ciliary body by diffusion and active transport from plasma. It flows through the pupil and fills the anterior chamber of the eye. It is normally reabsorbed through a network of trabeculae into the canal of Schlemm, a venous channel at the junction between the iris and cornea. Obstruction of this outlet leads to increased intraocular pressure.

THE EFFECT OF PREGNANCY ON IOP:

HORMONAL CHANGES DURING PREGNANCY

In pregnancy, the placenta forms large quantities of human chorionic gonadotropin (HCG), estrogen, progesterone and human chorionic somatomammotropin, which are essential for a normal pregnancy.

ESTROGEN AND PROGESTERONE:

The placenta like the corpus luteum, secretes both estrogens and progesterone, these are secreted by the syncitial trophoblast cells of placenta. Throughout the pregnancy, estrogen levels gradually rises and reaches a peak at 40 weeks, towards the end of pregnancy. The daily production of placental estrogen in creases to about 30 times the mother’s normal level of production.
Progesterone is secreted in moderate quantities by the corpus luteum at the beginning of pregnancy, later it is secreted in tremendous quantity by the placenta, averaging about 10 fold increases during the course of pregnancy. But occasionally the progesterone levels falls at 38 weeks but this is not constant.

HUMAN CHORIONIC GONADOTROPIN:

With the development of trophoblast cells from the early fertilized ovum, the hormone HCG is secreted by the syncitial cells in to the fluids of mother. the secretion of this hormone can be measured first in the blood 8 to 9 days after ovulation, shortly after the blastocyst implants in the endometrium. Then the rate of secretion rises rapidly to reach a maximum at about 10-12 weeks of pregnancy and decreases back to a lower value by 16 to 20 weeks. It continues at this level for the reminder of pregnancy.

MATERIALS & METHODS

- Schiotz tonometer, Weights and scale card, Local Anaesthesia (lignocaine), Anti inflammatory drops (paracaine), Clean cotton of gauzeswab.

In this study, 50 pregnant women were studied. The study population was divided in to three groups;

- Group I first trimester, Group II: second trimester, Group III:third trimester

Informed consent was taken from the volunteers to measure the intraocular pressure. Intraocular pressure was measured using Schiotz Tonometer. Before starting the study, the protocol was approved by the Ethical Clearance Committee.

The study population was selected based on the following criteria

INCLUSION CRITERIA:

- Individuals between the age of 18-60 years were included in this study.
- 50 Normal pregnant women in first, second and third trimester.

EXCLUSION CRITERIA:

- Subjects with refractive errors
- Subjects with irregular menstrual cycle
- Subjects with cardiac or respiratory diseases
- Subjects with any pre-existing endocrinal disorders

METHODOLOGY:

Before recording IOP the following parameters were recorded like age, weight, body mass index, blood pressure, social status using appropriate standard instruments.
Results suggest that a hormonal influence may be acting in the female to protect the outflow channels of the anterior chamber. A more likely state of affairs would seem that a balance is maintained by the three hormones working together, oestrogen and progesterone providing a background against which relaxin can take effect. In our study we found that there was a significant decrease in IOP in advanced pregnancy.

There are many mechanisms that have been proposed to explain why IOP decreases during pregnancy in healthy women. Initial theories focused on the hormonal levels that fluctuate during pregnancy, such as oestrogen, relaxin, progesterone, and β-human chorionic gonadotropin. It has been shown that the aqueous humour formation rate does not change during pregnancy but the outflow facility increases during pregnancy, causing a decrease in IOP. In addition, Wilke (2009) demonstrated a decrease in episcleral venous pressure during pregnancy is likely multifactorial, involving hormonal mechanisms and second messenger systems that result in increased outflow facility and in decreased episcleral venous pressure.

The rate of aqueous formation and facility of outflow are known to decrease with the advance in age. According to Becker (1963) it is not known whether these are independent or related to each other; he has reported that a decrease in rate of aqueous formation results in the decrease in the facility of the outflow. His hypothesis says decrease in inflow may decrease the nutritional supply of trabecular meshwork causing variation in outflow value.

Conversion tables to obtain Po (resting intraocular pressure) from Pt (pressure with the tonometer on the eye) were developed from studies done on cadaver eyes by Friedenwald. These values were basically confirmed by McBain in studies using an adjustable manometer. The scale reading of the tonometer with each plunger weight was recorded.

### STATISTICAL ANALYSIS

The data collected were entered in the MS excel spreadsheet. Descriptive table was generated and appropriate statistical analysis was done using SPSS17.0 software.

ANOVA (Analysis of Variance) was applied to compare the IOP in different phases of menstruation, pregnancy and menopause. A significance level of p value < 0.05 was considered for the ANOVA. The data were expressed as mean ± standard deviation.

### RESULTS

#### INTRAOCULAR PRESSURE IN DIFFERENT TRIMESTERS OF PREGNANCY

Table 1 shows IOP measured during first trimester in the right eye was 16.1±2.9 mmHg and left eye was 16.1±2.7 mmHg where as during second trimester in right eye it was 13.2±2.4 mmHg and in the left eye it was 13.6±1.6 mmHg and during third trimester in the

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<th>5.5 g</th>
<th>7.5 g</th>
<th>10 g</th>
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<td>Left eye</td>
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<td>2.6340</td>
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### DISCUSSION

Results suggest that a hormonal influence may be acting in the female to protect the outflow channels of the anterior chamber. A more likely state of affairs would seem that a balance is maintained by the three hormones working together, oestrogen and progesterone providing a background against which relaxin can take effect. In our study we found that there was a significant decrease in IOP in advanced pregnancy.

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CONCLUSION

In our study we found that there was a significant decrease in IOP in advanced pregnancy. But no significant change was observed in first and second trimester.

The levels of sex hormones fluctuate predictably throughout pregnancy. There is a growing awareness that sex hormones play a major role.

Physiologically oestrogen is a water retaining hormone, an action manifested by increase of blood volume, rise of blood pressure and increased body weight. Water retention could be said to be one of the important factors in raising intraocular tension. A rise in intraocular pressure (IOP) may offer the first sign in the diagnosis of glaucoma hence the need to investigate the influence of intraocular pressure in pregnancy which forms an integral part of womanhood. (Ajayi Bosede Olajire and Idu, Faustina (2005).

The problem of glaucoma in recent years has assumed such wide proportions as to call for a drastic reorientation in our approach. One aspect of the subject, namely the aetiology of glaucoma still remains shrouded in a veil of mystery.

Acknowledgement: I express my sincere thanks to my department, colleagues, technicians for their constant encouragement throughout my study.

REFERENCES