INTRAOCULAR PRESSURE DURING NORMAL PREGNANCY AND PREGNANCY INDUCED HYPERTENSION

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SUMMARY

A significantly lower intra-ocular pressure (IOP) (11.9 mmHg) was observed in pregnant women in third trimester when compared to non-pregnant women of the same age group (14.5 mmHg). Thus, the ocular hypotensive effect of late pregnancy was confirmed. The mean IOP of third trimester normotensive pregnant women (11.9 mmHg) was almost similar to that of patients of PIH (12.1 mmHg), thereby suggesting that the factors responsible for lowering the IOP, act independent of blood pressure.

Introduction

Pregnancy is an altered physiological state that produces intricate and complex changes throughout the body. The effect of pregnancy on intraocular pressure (IOP) has been studied occasionally in the past, but very seldom in recent years. A fall in IOP occurs in the second half of pregnancy and continues for several months into the puerperium (Horven and Gjonnaess, 1974). Very little work has been done to know the effect of pregnancy induced hypertension (PIH) on IOP. The present study was undertaken to study the (a) effect of late pregnancy on IOP, (b) effect of PIH on IOP, and (c) to compare the two.

Material and Methods

Seventy five women included in the present study were selected from the women attending the Eye, Obstetrics and Gynaecology outdoor and those admitted in Obstetrics and Gynaecology ward of Medical College Hospital. They were grouped as under:

	Number
Group A	
Control group	
Normotensive, nonpregnant women	25
Group B	
Normal pregnant women (34-38 weeks pregnant)	25
Group C	
Pregnancy-induced hypertension (34-38 weeks pregnant)	25

All women included were between 18-35 years of age. Those with refractory error of ± 1.0 OD were excluded from the study, lest the known tendency for high IOP to be associated with myopia and low pressures with hypermetriopia

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bias the results (Tomlinson and Philips, 1970). Women on oral contraceptives, those with history of diabetes or hypertension were also not included. Each patient had a complete eye examination which included refraction, fundus examination, skiascopy and subjective testing. IOP was measured in both the eyes of the patient by Schiotz Indentation Tonometer by 5.5 Gm weight, after the patient had been lying relaxed for 10 min. The scale readings were converted to IOP in mmHg from the conversion tables. Brachial blood pressure was taken by the same observer with the patient in sitting position.

Results

Results are depicted in Table I. The mean IOP of normal pregnant women (11.9 mmHg) and patients of PIH (12.1 mmHg) was significantly lower than the mean IOP in control group (14.5 mmHg). The difference was highly significant statistically ($p < 0.001$). However the difference in IOP in the later two groups was very small and was not significant ($p > 0.1$) (Table II).

TABLE II

p Values for Mean IOP in the Three Groups

Group A vs B:	t=5.78,	df=48,	p <0.001
Group A vs C:	t=5.33,	df=48,	p <0.001
Group B vs C:	t=0.5,	df=48,	p <0.01

Discussion

An association between hypertension and high IOP is well established (Dienstbier *et al*, 1950). Systemic blood pressure has been claimed to be a diagnostic tool for glaucoma as the association between vascular hypertension and open angle glaucoma is universally accepted. Contrary to it, we observed a very similar IOP in normal pregnant women and patients of PIH. Philips and Gore (1985) also had similar results. The reason for this lower IOP observed in PIH patients of our study may be due to presumed difference in aetiology between the two hypertensions, but difference in age may also be important.

The low IOP in pregnancy was first reported by Impre (1922). It was later confirmed by other workers (Dominguez, 1951; Horven and Gjonnaess, 1974). Exact reason for a lower pressure is not known. Different postulations have been put forward. It could be that the physiological softening of ligaments in late pregnancy might extend to that of

TABLE I

Ocular Tension in Two Pregnant Groups and Non-pregnant Control

	Number	Mean age ± SD (years)	Mean systolic BP±SD (mmHg)	Mean diastolic BP±SD (mmHg)	Mean IOP±SD (mmHg)
Nonpregnant normotensive control (Group A)	25	25 ± 3.1	120.3 ± 3.6	80.1 ± 2.5	14.5 ± 1.7
Normal pregnant women (Group B)	25	24.2 ± 3.1	117.3 ± 9.9	77.9 ± 5.9	11.9 ± 1.4
PIH (Group C)	25	24.1 ± 4.0	147.9 ± 17.4	102.5 ± 13.4	12.1 ± 1.4

corneo-scleral envelope to produce reduced corneo-scleral rigidity and therefore only an apparent fall in IOP. However Horven and Gjonnaess (1974) did not find any change in ocular rigidity. They held the reduced episcleral venous pressure during pregnancy responsible for the low IOP.

Aqueous outflow has been found to be increased during pregnancy, as well as during the estrogen and estrogen-progesterone phase of menstruation (Paterson and Miller, 1963). During pregnancy, the level of gonadal hormones estrogen, progesterone and relaxin increases. These hormones, when given to patients, have been found to reduce IOP and increase the facility of aqueous outflow (Paterson and Miller, 1963; Treistor and Mannor, 1970).

Thus improved uveoscleral outflow which results from hormonal changes in late pregnancy, seems to be a more likely explaination for a fall in IOP (Philips and Gore, 1985).

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