

EFFECT OF HYSTERECTOMY ON GLUCOSE TOLERANCE TEST

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SUMMARY

In the study, panhysterectomy for D U B 90, myoma uteri 50 and adenomyosis 20 was done while vaginal hysterectomy with preservation of ovaries for uterovaginal prolapse was performed in 40 cases of control group. Oral glucose tolerance test (GTT) was done preoperatively as well as postoperatively. In study group there was significant fall in mean blood sugar level (BSL) postoperatively. In control group though there was fall in BSL it was not significant. The preoperative mean BSL was higher in study group. It was markedly higher in myoma and adenomyosis than in DUB. After panhysterectomy maximum fall in BSL was observed in myoma ($P < 0.001$) as compared to DUB ($P < 0.05$) and adenomyosis ($P < 0.05$). This study suggests diabetogenic property of oestrogen.

INTRODUCTION

The various gynaecological diseases such as DUB, myoma uteri and adenomyosis uteri where hysterectomy is required are thought to be hormone dependent in which oestrogen as a etiological factor plays an important role. Diabetogenic effect of oestrogen, human growth hormone and corticosteroids is well postulated (William

et al, 1966, Spellacy et al, 1972, Wynn et al, 1967). The action of progesterone on GTT is not clear. It probably causes improvement of carbohydrate tolerance. The study is conducted to evaluate the diabetogenic effect of oestrogen.

SUBJECT AND METHOD

Women of various gynaecological diseases admitted in the Department of Gynaecology and Obstetrics, J.L.N. Hospital, Ajmer were selected for

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Accepted for Publication on 26.5.95

Table I
Comparison of G.T.T. Pre and Post Operatively in Control and Study Group

G.T.T.	Control Group				Study Group			
	Mean Blood Sugar in mgs. Preoperatively	Mean Blood Sugar in mgs. Post-Operative	% fall in Blood Sugar	Significance P Value	Mean Blood Sugar in mgs. Preoperative	Mean Blood Sugar in Mgs. Post Operative.	% Fall in Blood Sugar	Significance. P.Value
0 Hr.	73.30	72.30	1.36	>0.01	81.63	75.40	7.6	<0.01
1 Hr.	107.86	105.90	1.80	>0.01	120.40	108.32	10.03	<0.001
2 Hrs.	86.70	86.40	0.34	>0.01	91.76	84.62	7.78	<0.01

Table II
Comparison of G.T.T. of Control with Study Group Preoperatively

	Mean Blood Sugar in mgs. Control	Mean Blood Sugar in mgs. Study	% Higher Blood Sugar in Study	P Value	DUB		Myoma		Adenomyosis	
					Mean Blood Sugar in mgs.	% Higher Blood Sugar	Mean Blood Sugar in mgs.	% Higher Blood Sugar	Mean Blood Sugar in mgs.	% Higher Blood Sugar
0 Hr.	73.30	81.63	11.36	<0.01	80.11	9.29	84.04	14.65	83.90	14.46
1 Hr.	107.86	120.40	11.68	<0.01	116.13	7.66	129.12	19.71	116.80	8.34
2 Hr.	86.70	91.76	5.68	>0.01	92.31	6.47	93.44	7.77	86.90	0.23

Table III

Comparison of Fall of Blood Sugar Level in Control and Study Group Post Operatively.

G.T.T.	Control	Study	D.U.B.	Myoma	Adenomyosis
0 Hr.	1.36%	7.6%	6.05%	10.6%	7.50%
1 Hr.	1.80%	10.03%	8.65%	13.56%	6.67%
2 Hr.	0.34%	7.78%	5.05%	7.36%	4.02%

hysterectomy. Women with known history of diabetes were excluded from the study.

Patients were divided into control and study group. In control group, vaginal hysterectomy with preservation of ovaries was done, while in study group panhysterectomy was performed. In each case oral glucose tolerance test was done twice, one preoperatively and second on 7th to 8th day postoperatively by glucometer apparatus.

OBSERVATION

The age distribution was from 30 to 50 years with maximum number patients over 40 years of age in both groups.

In 40 cases of control group vaginal hysterectomy with preservation of ovaries was done for uterovaginal prolapse. In study group of 160 patients panhysterectomy was performed. The indication of panhysterectomy was DUB 90, myoma uteri 50 adenomyosis 20.

In control group there was a fall in mean blood sugar level (BSL) postoperatively, it being 1.36%, 1.8%, 0.3% respectively at 0, 1 and 2 hours of GTT which was not significant, but in study group there was significant fall in mean BSL postoperatively being 7.6%, 10.03%, 7.78%

respectively at 0, 1 and 2 hours of GTT (Table I).

The mean BSL was significantly higher in study group preoperative as compared to control (Table II). The preoperative higher fasting BSL was more marked in myoma and adenomyosis than in DUB. During 1st hour it was still more marked in myoma than in adenomyosis and DUB. During 2nd hour there was less marked rise in BSL in myoma and DUB while in adenomyosis there was very little change compared that of control (Table II).

After panhysterectomy (postoperatively) there was marked fall in mean BSL in myoma, DUB and adenomyosis as compared to control. Fall was maximum in myoma ($P < 0.001$) as compared to DUB ($P < 0.05$) and adenomyosis ($P < 0.05$) at 0 and 1 hour but it was less marked at 2 hours of GTT (Table III).

DISCUSSION

The ovaries are the main source of oestrogen. During normal menstrual cycle there is no change in glucose tolerance (Spellacy et al, 1967) as balance between pituitary-ovarian-uterine axis is maintained. Diabetogenic action of oestrogen is well demonstrated by various studies conducted

after oestrogen therapy. Goldman and Dvandia (1969) gave oral oestrogen therapy in postpartum and postmenopausal women and observed significant impairment of I.V. GTT during therapy which returned to pretreatment value on discontinuation of therapy. Oestrogen increases the plasma protein binding of insulin and inactivates it (William et al, 1966). Peripheral antagonistic action of insulin either directly or indirectly by oestrogen is suggested by Poala et al 1968). Diabetogenic action of oestrogen may also be produced by stimulating the human growth hormone (Spellacy et al, 1967). Or by modifying metabolism of hydrocortisone which produces steroid diabetes by increasing the total plasma hydrocortisone (Wynn et al, 1967).

Nanda and Sanu (1981), detected significant change in oral GTT following panhysterectomy while no change was detected when ovaries were preserved. Significant higher blood sugar levels were detected preoperatively with myoma and

DUB, suggested to be due to preponderance of oestrogen in these cases. In the present study also higher blood sugar levels were detected in myoma, DUB and adenomyosis preoperatively as compared to control group. The level of sugar was highest in myoma group. Postoperatively, in study group the significant fall in blood sugar was observed in all cases but it was more marked with myoma. This study also favours diabetogenic action of oestrogen.

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