

STUDY OF GLUCOSE TOLERANCE TEST IN MYOMA UTERUS

by

U. K. NANDA,* M.S., F.I.C.S.

and

G. SANU,** M.D.

Uterine myomas is a common gynaecologic disease but the exact etiology or the factor that stimulate their growth is not known. A sustained estrogenic preponderance has been suggested to be an associate factor (Lipschutz and Iglesias, 1938) which is well supported by the association of endometrial hyperplasia and carcinoma of the endometrium. Growth hormone was found to be higher in patients with myoma uterus but unrelated to the size of the tumor (Spollacy *et al*, 1972).

Growth hormone exerts its diabetogenic action by inhibiting glucose utilization in the muscles (Evans *et al* 1932). Oestrogen increases the plasma protein binding capacity of insulin and renders it inactive. It can prolong the biological half life of hydrocortisone and potentiates its diabetogenic action (Tait and Bonsten, 1964).

A temporary diabetogenic action of estrogen and definite diabetogenic property of growth hormone and their association with myoma uterus suggest that

myoma uterus may be associated with disturbed carbohydrate metabolism.

Material and Methods

The present study includes 50 patients with uterine myomas admitted to the V.S.S. Medical College Hospital. A control group of 20 cases was selected from the patients admitted for other gynaecological problems, like infertility, prolapse uterus and V.V.F. Oral glucose tolerance test was done by modified Nelson and Somagyi (1952) method before operation and 10th to 12th postoperative day. Endometrial biopsy was done in the study group to find out the other endometrial pathology.

Observations

Observations are given in Table I to V.

Discussion

The mean blood sugar values of the study group were higher than the corresponding values in the control group and they were statistically significant in all except the first hour sample (Table I). These higher values may be due to (1) the mean age of the patients in study group (41.3 years) is higher than that of the control group (35.4 years), (2) in the study group 3 diabetics were detected.

Spellacy *et al* (1972) observed 87.0

*Professor and Head.

**Resident.

Department of Obstetrics and Gynaecology, V.S.S. Medical College, Burla.

†Read in the XXIII All India Congress of Obstetrics and Gynaecology, Bangalore, December, 1979.

‡Present address: MKCG Medical College, Berhampur (GM)-4, Orissa.

Accepted for publication on 9-4-80.

TABLE I
Comparison of G.T.T. Values in Study and Control Group

Time in Hrs.	Mean blood Study Gr.	Sugar in mg.% Control Gr.	t	p	S/NS.
'0' hr.	87.70 ± 14.77	80.40 ± 6.24	2.13	<0.05	S
1st hr.	127.60 ± 22.26	120.30 ± 13.38	1.37	<0.05	NS
2nd hr.	106.62 ± 21.33	92.55 ± 8.96	2.83	<0.05	S
3rd hr.	86.66 ± 17.71	77.35 ± 8.99	2.23	>0.05	S

TABLE II
Comparison of Mean Blood Sugar Values in Pre- and Post-operative Period of Non-diabetic Patients Who Had Undergone Abdominal Hysterectomy (36 Cases)

Time in Hours	Mean Blood Pre. opt. G.T.T.	Sugar in mg.% Post. Opt. G.G.T.	t	p	S/NS
'0' hr.	86.03	80.22	2.83	<0.05	S
1st hr.	128.08	121.00	3.66	<0.05	S
2nd hr.	104.53	100.39	2.75	<0.05	S
3rd hr.	84.83	80.92	1.91	<0.05	S

TABLE III
Comparison of Mean Blood Sugar Values in Pre- and Post-operative Period of Non-diabetic Patients Who had Undergone Polypectomy or Myomectomy (10 Cases)

Time in hours	Mean Blood Pre. opt.	Sugar in mg.% Post. opt. G.T.T.	t	p	S/NS
'0' hr.	81.2	80.1	0.84	>0.05	NS
1st hr.	113.1	112.9	0.13	>0.05	NS
2nd hr.	96.3	95.3	0.57	>0.05	NS
3rd hr.	76.8	76.0	0.44	>0.05	NS

TABLE IV
Comparative Study of G.T.T. in Non-diabetics With Small and Large Tumor (Uterus with Myoma)

Time in Hours	Mean Blood Pts. with large tumors (1001 Gm. & above)	Sugar in mg.% with small tumors (50-250 Gm.)	t	p	S/NS
'0' hr.	89.33 ± 12.44	81.85 ± 8.88	1.34	>0.05	NS
1st hr.	132.44 ± 16.73	118.57 ± 16.32	1.66	>0.05	NS
2nd hr.	112.00 ± 17.59	92.14 ± 8.88	2.72	<0.05	S
3rd hr.	90.66 ± 13.87	18.14 ± 9.75	1.54	>0.05	NS

TABLE V
Glucose Tolerance Test in Patients with Hyperplastic and Secretory Endometrium

Time in hrs.	Mean Blood Sugar in mg.%		t	p	S/NS
	Hyperplasia	Secretory			
0'	82.5 ± 8.59	82.14 ± 7.08	0.09	>0.05	NS
1st hr.	122.5 ± 14.83	106.28 ± 12.86	2.34	<0.05	S
2nd hr.	100.4 ± 17.34	92.85 ± 12.85	0.98	>0.05	NS
3rd hr.	79.2 ± 11.70	81.42 ± 11.30	0.39	>0.05	NS

mg% mean fasting blood sugar level in patients with myoma uterus as compared to mean fasting blood sugar level of 87.7 mg% in the present study.

Mean blood sugar values in patients who had undergone abdominal hysterectomy were significantly higher than their corresponding postoperative values (Table II and III). But such variations were not found in the patients who had undergone polypectomy or myomectomy. These findings can be explained on the basis of preservation of ovaries. In cases where both or one ovary was removed along with hysterectomy the post-operative G.T.T. revealed significantly lowered values. It may be due to temporary diabetogenic action of the estrogen (Goldman and Ovadia, 1969).

Excluding the diabetics, the cases in the study group were divided into 4 groups according to the weight of the uterus with myoma (50-250 mg, 251-500 mg, 501 to 1000 mg, and 1001 mg and above). Mean blood sugar values of the patients with larger tumors (1001 mg and above) in the 1st hour and 2nd hour were significantly higher than the corresponding values in the patients with in similar tumours (Table IV). Unless growth hormone estimation is done in all these cases before and after operation and their corresponding blood sugar values are compared. We can not account for this higher blood sugar values in the patients

with tumors. Spellacy *et al* (1972) had found human growth hormone level to be higher in patients with uterine myomas but not related to the weight and size of the tumor.

Comparison of G.T.T. in the study group with endometrial hyperplasia revealed all except the 3rd hour mean value were higher than in patients with secretory endometrium and the first hour value was significantly elevated. The higher values can be done to excess estrogen in patients with hyperplastic endometrium.

Summary and Conclusion

The mean blood sugar values of cases with myoma uterus were higher than in the controls.

The postoperative glucose tolerance test revealed significantly lowered blood sugar values compared to the corresponding preoperative values in 36 non-diabetic patients who had undergone abdominal hysterectomy and no significant change in 10 nondiabetic patients who had undergone only polypectomy or myomectomy.

Mean blood sugar values in patients with myoma uterus weighing more than 1000 gm. higher.

The histopathological study of the endometrium showed hyperplastic change in 20% cases of myoma uterus. The mean blood sugar values in patients with hyperplastic endometrium were higher than in

the patients with secretory endometrium and significantly so in the 1st hour.

The higher values may be attributed to certain endocrinological imbalances associated with myoma uterus-either estrogen or growth hormone.

Acknowledgements

The authors are thankful to the Superintendent, V.S.S. Medical College Hospital, Burla for permitting them to utilise the hospital date and Prof. R. C. Misra, Head of Pathology Department for giving all facilities to do the investigations in his Department.

References

1. Evans, H. M., Meyer, K., Simpson, M. E. and Reichart, F. L.: Proc. Soc. Exp. Biol. Med. 29: 857, 1932.
2. Goldman, J. A. and Ovadia, J.: Am. J. Obstet. Gynec. 103: 172, 1969.
3. Lipsonuts, A. and Iglesias, R.: C. r. Seanl. Soc. Biol 129: 519, 1938.
4. Nelson, N.: J. Biol. Chem. 153: 375, 1944.
5. Somegyi, M.: J. Biol. Chem. 195: 19, 1952.
6. Spellacy, W. N., Le Maire, F. W. J. and Buhi, W. C.: Obstet. Gynec. 40: 829, 1972.
7. Tait, J. F. and Bunsten, S.: In pincus, G. Thimann, K. V. and Astwood, E. B. Editors: Newyerk 1964, Academic Press. Inc., Vol. V, page 441.