PROFILE OF POLYCYSTIC OVARIAN DISEASE IN GYNAECOLOGIC ENDOCRINE CLINIC

by

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Introduction

In contrast to the characteristic picture of fluctuating estradiol level in the normal cycle, polycystic ovarian disease is characterised by a steady state of tonic gonadotropin and oestrogen production associated with persistent anovulation. This is reflected in higher circulating levels of testosterone, androstenedione and higher levels of estrogen (largely estrone) derived from extraglandular peripheral conversion of androstenedione.

When compared with normal women, patients with polycystic ovaries have higher level of LH but low or low normal levels of FSH. The elevated level of LH may be in the range of midcycle surge. This increase level is probably the effect of the increased estrone level (positive feed back). The lower FSH value represents the negative feed back effect of elevated levels of estrone.

In response to elevated LH level, the androgen production rate is increased. In twin increase androgen level through extraglandular peripheral conversion raises estrogen (mainly oestrone) level. This is a major factor for depressing FSH level and elevating LH secretion. The elevated androgen also blocks the actions of estradiol on the granulosa cells within the ovary and inducing premature atresia and results in dense stromal tissue (Speroff *et al* 1978).

One group of investigator has indicated that the high LH levels in anovulatory patients are associated with big ovaries while low LH level are found in association with small ovaries (Berger *et al* 1975), while others have failed to find a relationship between the size of the polycystic ovaries and the levels of LH (Rebar *et al* 1976). The size of the ovary is not a critical feature nor is it necessary to assign a specific etiology (Speroff *et al* 1978).

Recently, an association of hyperprolactinaemia with polycystic ovarian disease has been observed by Algier *et al* (1980). In polycystic ovarian syndrome the mechanism of dopaminergic control of prolactin secretion is disturbed. In order to explain the association of hyperprolactinaemia and polycystic ovaries, it is suggested that either the abnormal status acts on the hypothalamic regulation or the hyperprolactinaemia per se may induce disorder of ovarian steroidogenesis leading to morphological changes in ovaries (Algier *et al* 1980).

Material and Methods

A total of 205 women attending the gynaecological endocrine clinic in the

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department of Obst. & Gynec. PGIMER, Chandigarh, during the period from January 1979 to December, 1980 were selected for the present study.

The clinical evaluation included detailed history and examination, thyroid assessment with T_3, T_4 and TSH, prolactin assay, plasma cortisol, testosterone and 17 Beta estradiol. Dexamethasone suppression test were carried out whenever indicated. Adrenal hyperplasia was thought of when basal plasma cortisol value exceeded beyond 25 microgram%.

Serum FSH and LH determinations were performed by double antibody homologous radioimmunoassays.

In case where basal serum prolactin exceeded beyond 20 ng/ml, evaluation of sella turcica were carried out with radiology and also visual field study.

Results

There were a total of 66 cases with polycystic ovarian disease during the above period.

TABLE I
Distribution

Age	*No.*	*Percentage*
10-20 years	9	13.6
21-30 years	49	74.2
31-40 years	8	12.1%
More than 40 years	Nil	Nil

Table I shows age distribution of 66 cases. Majority of them belonged to 21-30 years age group, while only 9 (13.6%) were either or below 20 years of age.

TABLE II
Marital and Parity Status

Uterus	*No.*	*Percentage*
Married	48	72.7%
— Nulliparous	28	42.4%
— Parous	20	30.3%
Unmarried	18	27.2%

Above Table shows fertility status of these cases. Twenty-eight (42.4% cases were infertile, duration of marriage were from 2 to 10 years, while 20 (30.3%) cases were parous only.

Almost all cases had from fairly developed to well developed secondary sex character.

TABLE IV
Grades of Hirsuitism (Garn 1951)

Grade	*No.*	*Percentage*
I	Nil	Nil
II	33	50%
III	3	4.5%
IV	2	3.0%
V	Nil	Nil

This Table shows various grades of abnormal distribution of hair according to Garn (1951). The most prevalent distribution was facial hair followed by chest and lower abdomen and legs.

Thirty-three (50.0%) cases had mild degrees of hirsuitism while 5 (7.5%) cases had moderate to severe grades of hirsutism. Plasma testosterone in these cases

TABLE III
Secondary Sex Character (Tanner)

	I	*II*	*III*	*IV*	*V*
Breast	0	0	1.(1.5%)	6(9.0%)	59(89.3%)
Pubic hair	0	0	0	4(6.1%)	62(93.9%)

ranged from 0.18 to 1.9 ng/ml with a mean of 1.04 ng/ml.

TABLE V
Menstrual status

Status	*No.*	*Percentage*
Secondary amenorrhoea	37	56.0%
Oligomenorrhoea	19	28.8%
Hypomenorrhoea	5	7.6%
Primary amenorrhoea	Nil	Nil
Normal cycles	4	6.1%

Most frequent menstrual disturbance observed was secondary amenorrhoea. This was noticed in 37 (56.0%) cases followed by oligomenorrhoea and hypomenorrhoea. Normal menstrual cycles were found only in 4 (6.1%) of total cases.

TABLE VI
Relation of Hyperprolactinaemia with galactorrhoea (more than 20ng/ml)

	No.	*Percentage*
Hyperprolactinaemia	18	27.3%
Hyperprolactinaemia without galactorrhoea	15	22.7%
Galactorrhoea without Hyperprolactinaemia	2	3.0%
Galactorrhoea with Hyperprolactinaemia	3	4.5%

Above Table shows distribution of hyperprolactinaemia and its various association with galactorrhoea. There were 18 (27.3%) cases of hyperprolactinaemia, while only 3 cases had associated galactorrhoea. Evaluation of sella turcica in all these patients excluded any evidence of pituitary microadenoma. Serum prolactin in these patients ranged from 29 ng to 80 ng/ml with a mean value of 54.5 ng/ml.

Discussion

Patients with polycystic ovarian syndrome have higher levels of LH but low or low normal level of FSH (Speroff *et al* 1978). In response to elevated LH level, the androgen (androstenedione and testosterone) production is increased from functional stromal component of the ovary. Berger *et al* (1975) indicated that high LH levels are found in association with small ovaries, while present study failed to find any such correlation and this was in agreement with Rebar *et al* (1976). In the present study, serum LH ranged from 5.25 miu/ml to 100 miu/ml. (mean 52.6 miu/ml), and FSH from 2.0 to 30 miu/ml (mean 16.0 miu/ml), whereas 17 beta estradiol ranged from 52 pg/ml to 566 pg/ml with an average of 309 pg/ml.

There were a total of 38 (57.5%) cases with various grades of hirsuitism (Table IV). Clearly excessive androgen production from non-cycling polycystic ovaries stimulated sexual hair follicle conversion from lanugo to adult hair growth pattern: Although plasma testosterone level (normal 0.2 to 0.8 ng/ml) are elevated in the majority of women with anovulation and hirsuitism, but individual variations were great. This was due to the testosterone binding capacity in the blood and the metabolic clearance rate of testosterone. In the present study, plasma testosterone varied from 0.18 ng/ml to 1.9 ng/ml with a mean value of 1.04 ng/ml.

Menstrual disturbances viz. secondary amenorrhoea, oligomenorrhoea and hypomenorrhoea secondary to non-cycling ovaries were the most common findings in these cases. Out of a total of 66 cases with polycystic ovaries, 62 (92.9%) cases had various forms of menstrual abnormalities (Table V). Moreover, there were 28 (42.4%) cases who were married but infertile. The period of infertility ranged

from 2 to 10 years since marriage. 18 (27.3%) cases were unmarried (Table II).

Patients who have polycystic ovaries, menstrual disorder, obesity and hirsuitism may present a varied hormone profile. A number of dynamic tests of hypothalamo-pituitary function have shown that some of these patients have elevated blood levels of prolactin (Alger *et al* 1980), which may induce disorders of ovarian steroidogenesis leading to morphologic changes characteristic of polycystic ovarian syndrome (Futterweit and Krleger, 1979).

In the present study, there were 18 (27.3%) cases of hyperprolactinaemia associated with polycystic ovaries and only 2 (3.0%) of these cases had associated galactorrhoea. The serum prolactin level ranged from 29 ng to 80 ng/ml (normal 5 ng to 20 ng/ml) with a mean value of 54.5 ng/ml. In contrast to the previous reports (Flutterweit and Krleger 1979), there were no demonstrable pituitary adenoma with polycystic ovaries in these cases.

Summary

Sixty-six cases of polycystic ovarian disease were analysed in the Gynaecologic Endocrine Clinic. Menstrual disturbances were the most common presentation in 62 (93.9%) cases. Twenty-eight (42.4%) cases were infertile. Various grades of hirsuitism were found in 38 (57.5%) cases. Plasma testosterone in these cases varied from 0.18 ng/ml to 1.9 ng/ml with a mean value of 1.04 ng/ml. Eighteen (27.3%) cases of polycystic ovarian disease had associated hyperprolactinaemia. Present study failed to find any correlation between level of plasma LH and ovarian size.

References

1. Algier, M., Vazquez-Matute, L., Mason, M., Canales, E. S. and Zarate, A.: Fertil. Steril. 34: 70, 1980.
2. Berger, M. J., Taymor, M. L. and Patton, W. C.: Fertil. Steril. 26: 619, 1975.
3. Flutterweit, W. & Krleger, D. T.: Fertil. Steril. 31: 608, 1979.
4. Garn, S. M.: Ann. New York Acad Sc.: 53: 498, 1951.
5. Rebar, R., Judd, G. L., Yen, S. S. C., Rakoff, J., Vandenberg, G. and Naftolin, F.: Clin. Invest. 57: 1320, 1976.
6. Speroff, L., Glase, R. H. and Kase, M. G. (1978): Clinical gynaecologic endocrinology and infertility. 2nd Edition p. 123-134, The Williams & Wilkins Company, Baltimore, U.S.A.
7. Tanner, J. M. (1962): Growth of adolescence, 2nd Edition, p. 95. Oxford: Blackwell scientific publications.