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Clinical Presentation and Hormonal Profile of Patient with Non-Inflammatory Benign Breast Disease

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Abstract

Purpose: To study the serum levels of Estrogen, Progesterone, Leutinising hormone (LH), Follicle stimulating hormone (FSH), Testosterone, Thyroid stimulating hormone (TSH), Prostate specific antigen (PSA), Prolactin in patients with BBD. To determine an association (if any) between BBD and circulating levels of the above hormones.

Material and methods: Cross sectional study conducted in department of general surgery LLRH Kanpur for period 24 month in all adult females with clinical features of non inflammatory benign breast disorders were be included in the study like breast lump, nodularity, breast pain and nipple discharge. Statistical analysis was performed using student t test.

Results: A total of 134 patients with non- inflammatory benign breast diseases were included the study. The study patients were between 17-59 years of age, with an average age of 26.9 years. These patients had a BMI ranging from 14.32 kg/rn2 to 36.49 kg/m2, with an average BMI of 23.72 kg/m2. Of the 134 patients included in the study, 129 (96.26%) patients were in the reproductive phase, 2 were post-menopausal and 3 were post-hysterectomy. The age of menarche of these patients ranged from 12 to 17 years with an average of 14.4 years. 112 (83.58%) patients had regular periods and 17 (12.69%) complained of irregular periods. 46 (34.33%) of the patients in the study were nulliparous and the remaining 88 (65.67%) were parous, with at least 1 live issue. The age at first child birth for the parous females ranged from 16- 28 years, average being 21.27 years. Among the parous females, 83 had breast fed their babies for more than 1 year and the remaining 5 females had breast fed for less than 1 year.

Conclusion: The commonest presenting complaint of patients with BBD is breast pain. In our study of 134 patients with non-inflammatory BBD we found that 73.88% (99/134) patients had some abnormality in the circulating levels of at least one of the various hormones. From our study it is obvious that the breast is a target organ for a variety of hormones, whose interplay on the breast development and involution is still to be determined. The largest number of patients showed a decrease in the serum levels of testosterone (20.8%) and a significantly detectable level of serum PSA (69/134 51.4%)

Keywords: non inflammatory benign breast disease, estrogens, progesterone, testosterone, prolactine, TSH, FSH, LH, PSA

Introduction

Benign breast disorders (BBD) are one of the most commonest health problems seen in women of all age groups, particularly more in the reproductive age group. They include all the nonmalignant conditions of the breast. These disorders include all the aberrations in normal development and involution (ANDI) of the breast. Since development of the breast is under the influence of various hormones, aberrations in the development could be associated with aberrations in the circulating levels of these hormones.

Estrogen is responsible for development of ductal system and stroma, and progesterone and prolactin are responsible for glandular proliferation. Testosterone is said to inhibit the development of breast tissue in males. Thyroid stimulating hormone. Leutinizing hormone (LH) and follicle stimulating hormone (FSH) have a role in development of secondary sexual characteristic however, their exact role in breast development is not known.

Prostate specific antigen (PSA) is a hormone known to be secreted by the prostate gland and thought to be found only in males PSA has been found in females and a detectable concentration has been found in the normal breast as well as patients with benign and malignant breast diseases and has been shown to be secreted by the mammary gland cells.

Material and methods

This study was conducted on a cross sectional study in LLRH in the department of surgery with help of department of pathology, radiology, Department of Surgery, GSVM Medical College, Kanpur. In those patients who presented in surgery OPD in LLR Hospital with symptoms and sign of non inflammatory benign breast diseases.

Inclusion criteria

All adult females with clinical features of Benign breast disorders were be included in the study. These included patients with Breast lump, Nodularity, Breast pain and Nipple discharge.

Exclusion criteria

1. Patients with infective or inflammatory benign breast disorders
2. Patients who are pregnant or lactating at the time of presentation
3. Patients on hormonal treatment for any particular disease/ condition
4. Patients on birth control pills
5. Patients with clinically obvious features suggestive of malignancy,
6. Patients on long term medications that alter hormonal status/ mimic symptoms of BBD like anti-psychotics, anti-depressents, thiazides, methyldopain.

Observation

A total of 134 patioents with non inflammatory bening breast disease attending the surgery OPD at LLR Hospital, Kanpur.

The study patients were between 17-59 years of age, with an average age of 26.9 years.

These patients had a BMI ranging from 14.32 kg/m^2 to 36.49 kg/m^2, with an average BMI of 23.72 kg/m^2.

Of the 134 patients included in the study, 129 (96.26%) patients were in the reproductive phase, 2 were post-menopausal and 3 were post-hysterectomy. The age of menarche of these patients ranged from 12 to 17 years with an average of 14.4 years. 112 (83.58%) patients had regular periods and 17 (12.69%) complained of irregular periods.

46 (34.33%) of the patients in the study were nulliparous and the remaining 88 (65.67%) were parous, with at least

1 live issue. The age at first child birth for the parous females ranged from 16- 28 years, average being 21.27 years. Among the parous females, 83 had breast fed their babies for more than 1 year and the remaining 5 females had breast fed for less than 1 year.

Table 1: Hormonal profile of study patients with non-inflammatory BBD

	Estrogen	Progesterone	LH	FSH	Prolactin	Testosterone	TSH	PSA
Normal range	20-150 (pg/ml)	0-2.7 (ng/ml)	1.68-15 (lU/L)	1-10 (lU/L)	3.34-26.72 (ng/ml)	15-70(ng/dl)	0.34-5.6 (lUl/ml)	0-0.1 (ng/ml)
Study patients								
Range	20.8-848	0.103-28.30	1.58-43.57	1.83-66.40	1.85-59.28	2.2-68.7	0.08-26.98	0-0.2
Mean	102.8	1.02	9.01	8.48	18.22	24.49	3.48	0.009
<normal	0	0	0 (0.6%)	0	2 (1.4%)	27 (19.2%)	1 (0.6%)	0
>normal	12 (9.6%)	3 (2.8%)	8 (6.8%)	11 (8.8%)	11 (8.8%)	0	12 (9.6%)	18 (50.2%)

Table 2: Hormonal profile of study patients presenting with breast pain (n=90)

	Estrogen	Progesterone	LH	FSH	Prolactin	Testosterone	TSH	PSA
Normal range	20-150 (pg/ml)	0-2.7 (ng/ml)	1.68-15 (lU/L)	1-10 (lU/L)	3.34-26.72 (ng/ml)	15-70(ng/dl)	0.34-5.6 ( )	0 -0.1 (ng/ml)
Study patients								
Range	20.08-856	0.104-23.36	1.48-38.49	1.8-67.58	1.84-59.26	2.4-68.24	0.61-16.98	0.00-0.2
Mean	112.48	1.12	8.84	8.68	17.48	26.30	3.44	0.008
<normal	11 (11.98%)	3 (3.2%)	4 (5.7%)	7 (7.9%)	8 (8.9%)	0	10 (11.1%)	45 (50%)
>normal	0	0	1(1.1%)	0	1(1.1%)	16 (17.8%)	0	0

Table 3: Hormonal profile of study patients with nipple discharge

	Estrogen	Progesterone	LH	FSH	Prolactin	Testosterone	TSH	PSA
Normal range	20-150 (pg/ml)	0-2.7 (ng/ml)	1.68-15 (lU/L)	1-10 (lU/L)	3.34-26.72 (ng/ml)	15-70 (ng/dl)	0.34-5.6 (	0 -0.01 (ng/ml)
Study patients								
Range	22.52-126.74	0.412-0.984	4.67-42.71	6.78-27.28	2.77-59.29	12.86-28.08	2.24-3.17	0-0.04
Average	66.09	0.73	14.99	11.23	24.76	17.73	2.74	0.015
>normal	0	0	1 (16.7%)	1 (16.7%)	1 (16.7%)	0	0	4 (66.7%)
<normal	0	0	0	0	0	I (16.7%)	0	0

Table 4: Hormonal profile of study patients diagnosed as non-proliferative BBD (n=23)

		Estrogen	Progesterone	LH	FSH	Prolactin	Testosterone	TSH	PSA
Normal range		20-150 (pg/ml)	0-2.7 (ng/ml)	1.68-15 (lU/L)	1-10 (lU/L)	3.34-26.72 (ng/ml)	15-70(ng/dl)	0.34-5.6 (lU/ml)	0-0.01 (ng/ml)
	Study patients								
Range		21.04-276.3	0.105-24.32	1.57-42.71	1.86-27.29	2.77-59.29	4.45-40.12	0.87-15.41	0-0.02
Average		99.04	1.79	9.58	9.17	19.70	22.10	3.43	0.04
>normal		2 (8.7%)	1 (4.3%)	1 (4.3%)	3 (13.04%)	2 (8.7%)	0	1(4.3%)	15 (65.2%)
<normal		0	0	0	0	1 (4.3%)	5 (21.7%)	0	0

Table 5: Hormone profile of study patients diagnosed as proliferative BBD (n=67)

	Estrogen	Progesterone	LH	FSH	Prolactin	Testosterone	TSH	PSA
Normal range	20-150 (pg/ml)	0-2.7 (ng/ml)	1.68-15 (lU/L)	1-10 (lU/L)	3.34-26.72 (ng/ml)	15-70(ng/dl)	0.34-5.6 (	0 -0.01 (ng/ml)
Study patients								
Range	24.27-537.6	0.13-6.92	1.85-38.86	2.32-66.45	5.61-52.76	2.5-67.71	0.09-26.94	0-0.08
Average	108.22	1.002	9.01	8.48	18.36	25.83	3.73	0.004
>normal	8 (11.9%)	3 (4.5%)	5 (7.5%)	6 (8.9%)	7 (10.4%)	0	7 (10.4%)	37 (55.2%)
<normal	0	0	0	0	0	11 (16.4%)	0	0

Discussion

After clinical, radiological and histopathological examination, most patients were diagnosed as proliferative BBD (50%; 67/134) followed by mastalgia (32.8%; 44/134) and the least number were diagnosed as non-proliferative BBD (17.2%; 23/134). Fibroadenoma was found in 36.57% (49/134) of the patients.

A study in Greece showed than among 578 women with BBD and no previous exogenous hormone use, 254 had non-proliferative disease, 324 had proliferative disease, which was similar to what was found in our study.

Mastalgia with or without nodularity was found in 102 out of 262 patients (39 %) by Navneet Kaur et al, of which 26 patients had associated nodularity.126 This was similar to our study where 44/134 patients had mastalgia (32.8%) of which 18 had associated nodularity.

In our study 13 (9.7%) patients out of the 134 included in the study showed an estrogen level above normal. This is in concordance with studies done by Sasaki et al and Pasqualini et al.

There were significantly detectable levels of PSA in 8 of the 13 patients with raised estrogen.

Increase in serum progesterone levels in 2 patients.

Umekita et al showed estrogen receptor, progesterone receptor, and PSA expression in 32%, 96%, and 4.0% of phylloides tumour sections and in 28%, 96% and 10% of fibroadenoma sections.

In our study, 9 (6.7%) out of the total patients in the study had raised LH levels.

In our study, 12 (8.95%) patients out of the study population showed an increase in FSH levels.

A study by Garde SV showed presence of higher levels of FSH in benign mammary lesions123' Macini et at studied 131 premenopausal females and exhibited an elevated FSH/LH ratio124.

In our study, 12 (8.95%) out of the 134 patients studied had a increase in prolactin levels and 2 had decreased prolactin levels.

Peters et al studied basal serum prolactin concentrations in 193 patients with fibrocystic disease and compared it to serum prolactin levels in 193 healthy women and showed

serum prolactin levels were above normal in 45.6% of the patients and in 21.2% of the control subjects.

Watt- Boolsen et al showed the basal PRL level was significantly elevated in patients with cyclical mastalgia

In the study conducted by us, 28 (20.89%) patients showed less than normal testosterone levels.

Our results may be explained by findings that suggest that in premenopausal women, circulating testosterone and estradiol levels peak at midcycle, but in transition to the luteal phase (during breast epithelial proliferation), testosterone levels go down and estradiol levels increase further.

In our study 13 (9.7%) out of 134 study patients patients were found to have raised TSH levels.

Another study by Estes where nineteen patients were evaluated for breast pain and nodularity associated with fibrocystic disease and treated with levothyroxine showed rapid pain relief occurred in 73% of patients with total relief in 47% after daily treatment with 0.1 mg of levothyroxine.

Our study showed that significant detectable levels of PSA were found in 69(51.49%) of the 134 patients with benign breast diseases.

Study by Narita et al studied 24 breast tumours in 2005 and detected PSA in 7% of normal breast tissues, in 54.5% of benign tumors113.

Considering the association of various hormones with benign breast diseases, a raised serum levels of all the 7 hormones (estrogen, progesterone, LH, FSH, prolactin, thyroid, PSA), most prominent with PSA, estrogen, prolactin and FSH, and a decrease in testosterone maybe associated with the occurance of BBD. This association is more with proliferative BBD than the non-proliferative ones.

Conclusion

The commonest presenting complaint of patients with BBD is breast pain. In our study of 134 patients with non-inflammatory BBD we found that 73.88% (99/134) patients had some abnormality in the circulating levels of at least one of the various hormones. From our study it is obvious that the breast is a target organ for a variety of hormones, whose interplay on the breast development and involution is still to be determined. The largest number of patients showed a decrease in the serum levels of testosterone (20.8%) and a significantly detectable level of serum PSA (69/134 51.4%)

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