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A Prospective Comparative Study On Assessment Of Polycystic Ovarian Disease

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Abstract:
Polycystic ovary syndrome (PCOS) is an endocrine-gynecology disorder affecting many women of childbearing age. Although a part of the involved mechanism in PCOS occurrence is discovered, the exact etiology and pathophysiology are not comprehensively understood yet. Androgen excess (male hormone excess), seen in 60-80% of girls and women with PCOS, is a key problem in the disorder and likely comes from ovaries in most women. The evidence suggests the several different external and internal factors which includes hyperandrogenism, insulin resistance, genetic, epigenetics and environmental factors. PCOS increases the risk of further complications like anxiety, depression, metabolic syndrome, cardiovascular diseases and type 2 diabetes mellitus, cardiovascular diseases. However, the symptoms can be successfully managed with proper medication and lifestyle interventions. In this review article, about PCOD are clearly explored. Physicians suggested to use anti androgen agents, insulin sensitizers, (combined) oral contraceptives, and ovulation inducers. According to United states food and drug administration (USFDA) there is no medication approved particularly for PCOD and all medications mentioned are off label used.

Key words: *PCOS, Anovulation, Hirsutism, Hyperandrogenism, External and Internal factors.*

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I. Introduction

Polycystic ovarian syndrome is an endocrinal disorder affecting the women of reproductive (14-44) age. It is a complicated illness associated with metabolic psychological endocrinal disorganization affecting major public health concern. Anovulation is the most consequent condition that affects the female fertility. Women with pcos found that irregular menstrual cycle and hirsutism have the largest impact on QOL. However, the main etiology of this disorder is not completely understood [1-2].

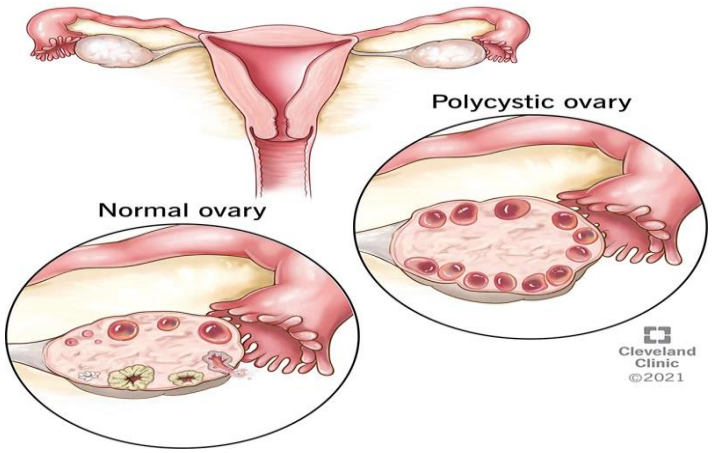

Figure 1: Polycystic ovary

II. Etiology of PCOS

Some causes like hormonal changes can make the ovaries to produce multiple follicles and finally leads to formation of cysts. Obesity and amenorrhea are the precursors of this syndrome. It is affecting 1 in every 15 women world widely [3]. However, women can reverse this condition by modifying their lifestyle, pharmacologically manageable. so, our study states that number of people prone to PCOD in tertiary care hospital and finding the comparative treatment between medication and lifestyle modification [4].

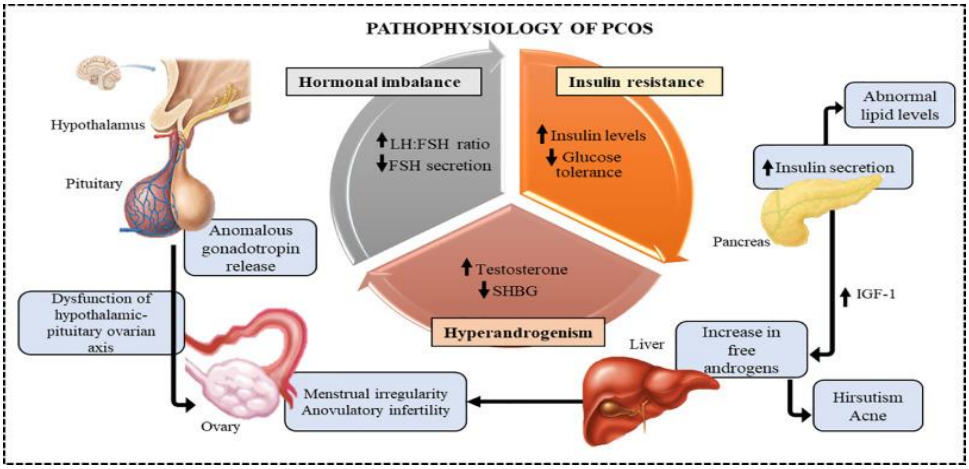

Figure 2: Brief insight into Polycystic Ovarian

MECHANISM

It involves excessive androgen production and decrease aromatization. Exact pathophysiology is not known.It may be diccussed under the following

1. Hypothalamic pituitary compartment abnormality
2. Androgen excess
3. Anovulation
4. Obesity and insulin resistance long term consequences

Hypothalamic-Pituitary Compartment in PCOS

Increased pulse frequency of GnRH leads to increased pulse frequency of LH. Leptin (a peptide, secreted by fat cells and by the ovarian follicle), insulin resistance and hyperandrogenemia are responsible for this, GnRH is preferential to LH rather than FSH [11]. Increased pulse frequency and amplitude of LH results in tonically elevated level of LH. FSH level is not increased. This is mainly due to the negative feedback effect of chronically elevated estrogen and the follicular inhibin. Increased free estradiol due to reduced sex hormone binding globulin (SHBG) bears positive feedback relationship to LH. The LH: FSH ratio is increased [12-13].

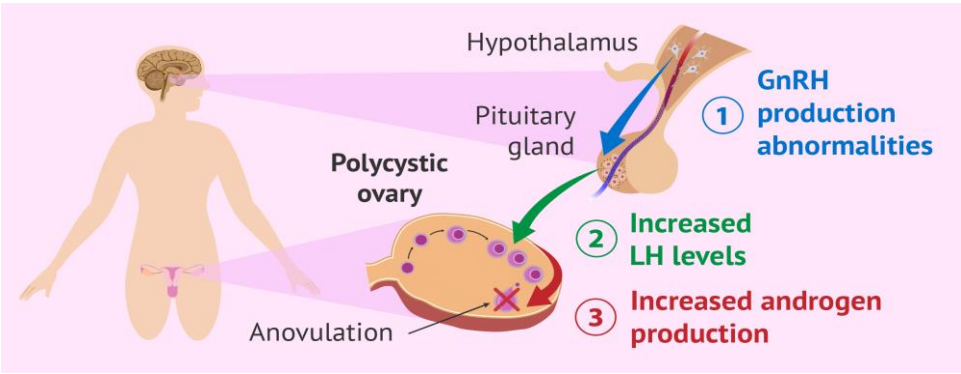

Figure 3: Hypothalamic-pituitary dysfunction in PCOS

Androgen Excess

Abnormal regulation of the androgen forming enzyme (P450 C 17) is thought to be the main cause for excess production of androgens from the ovaries and adrenals. The principal sources of androgens are

(A) Ovary
(B) Adrenal
(C) Systemic metabolic alteration.
A. Ovary produces excess androgens due to —
(i) Stimulation of theca cells by high LH
(ii) P450 C17 enzyme hyperfunction
(iii) Defective aromatization of androgens to estrogen
(iv) Stimulation of theca cells by IGF-1 (insulin growth factor-1)
B. Adrenals are stimulated to produce excess androgens by

(i) stress
(ii) P450 C17 enzyme hyperfunction
(iii) associated high prolactin level (20%).
C. Systemic metabolic alteration
(i) Hyperinsulinemia causes:
(a) Stimulation of theca cells to produce more androgens.
(b) Insulin results in more free IGF-1. By autocrine action, IGF-1 stimulates theca cells to produce more androgens.
(c) Insulin inhibits hepatic synthesis of SHBG, resulting in more free level of androgens. Features suggestive of insulin resistance are: BMI > 25 kg/m 2, Acanthosis nigricans and waist to hip ratio > 0.85. (ii) Hyperprolactinemia: In about 20% cases, there may be mild elevation of prolactin level due to increased positivity of GnRH or due to dopamine deficiency or both. The prolactin further stimulates adrenal androgen production.

Abnormal regulation of the androgen forming enzyme P450 C17 is thought to be the main cause for excessive production of androgens from the ovaries and adrenals [14]. The principal sources of androgens are Ovary, adrenal, systemic metabolic alteration. Ovary produces excess androgens due to:
A] Stimulation of theca cells by high LH
B] P450 C17 enzyme hyperfunction
C] Defective aromatization of androgens to estrogen
D] Stimulation of theca cells by IGF-1(insulin growth factor-1)

Anovulation

Because of low FSH level, follicular growth is arrested at different phases of maturation (2–10 mm diameter). The net effect is diminished estradiol and increased inhibin production. Due to elevated LH, there is hypertrophy of theca cells and more androgens are produced either from theca cells or stroma. There is defective FSH induced aromatization of androgens to estrogens. Follicular microenvironment is therefore more androgenic rather than estrogenic. Unless there is estrogenic follicular microenvironment, follicular growth, maturation and ovulation cannot occur [15-16]. There is huge number of atretic follicles that contribute to increased ovarian stroma (hyperthecosis). LH level is tonically elevated without any surge. LH surge is essential for ovulation to occur.

Gonadotropin hormones are namely follicle stimulating hormone (FSH) and luteinizing hormone (LH) which are produced by the pituitary gland which is produced as a response to gonadotropin-releasing hormone (GnRH) that is secreted by the hypothalamus.

Ovulation is controlled by two hormones. FSH role is stimulation of the growth of follicles into eggs in which LH action is the release of the eggs. PCOS is a group of symptoms that take interferes with ovulation and ovaries. PCOS mainly have the three following features namely: irregular periods, elevated androgen levels and the cysts which are fluid-filled sacs in the ovaries [17].

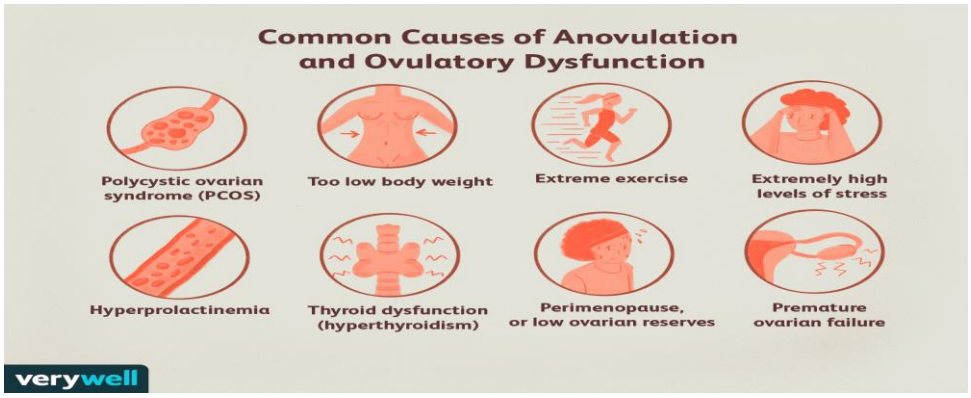

Figure 4: Anovulation and Ovulatory Dysfunction

The sacs in the ovaries are the immature follicles that are never prone to ovulation. Thus, lack of ovulation completely affects the hormonal levels in the body. Elevated androgen levels disrupts the regular monthly cycles. Environmental determinants, genetic alterations and genetic alterations are also one of the underlying causes of hormonal imbalance [18].

Obesity and Insulin resistance

Obesity and Insulin resistance Obesity (central) is recognized as an important contributory factor. Apart from excess production of androgens, obesity is also associated with reduced SHBG. It also induces insulin resistance and hyperinsulinemia which in turn increases the gonadal androgen production [19]. PCOS is thought to have a dominant mode of inheritance as about 50% of first-degree relatives have PCOS. Etiology of insulin resistance is unknown. Mutations of the insulin receptor gene in the peripheral target tissues and reduced tyrosine autophosphorylation of the insulin receptor, is currently thought to be an important cause. Increased central body fat leads to android obesity.

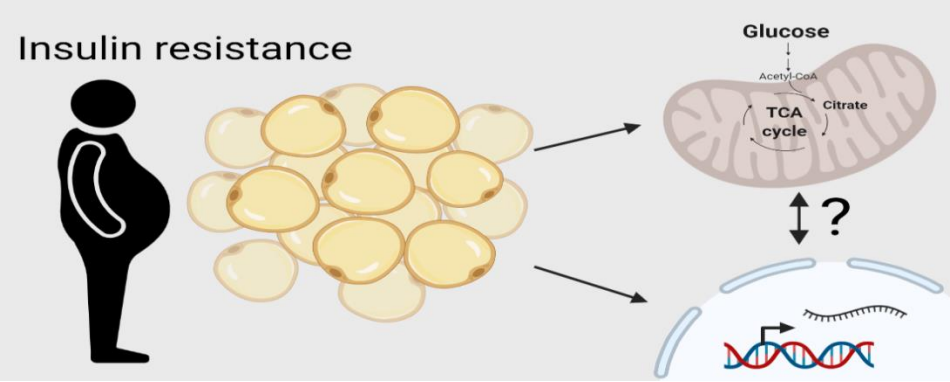

Figure 5: Unhappy fat: New clues on how obesity drives metabolic dysfunction

Long-term consequences

It occurs in a patient suffering from PCOS includes: The excess androgens (mainly androstenedione) either from the ovaries or adrenals are peripherally aromatized to estrone (E1). There is concomitant diminished SHBG. Cumulative excess unbound E2 and estrone results in a tonic hyper estrogenic state. There is endometrial hyperplasia.

CLINICAL MANIFESTATIONS

- PCOS causes many symptoms based on adult female however, the patients having pcos have different clinical manifestations but some clinical manifestations under the following:

Irregular menses

- It involves high bleeding, missed periods, irregular cycles. Periods occurs at the starting stage of menarche; some patients have regular years for some years but they become irregular after some years this may be sign to pcos.

Over expression of hormones [androgens]

- Androgens play major role in the pcos, male hormone releases excessively during pcos condition
  - Over blackness and excessive hair, called **hirsutism**, on the chin, upper lip, around the breasts, and on the midline of the abdomen
  - Male-pattern baldness (receding hairline)

Common symptoms of PCOS

- Irregular periods or no periods but occurs heavy flow
- Hirsutism i.e., growth of hair on the face, back, chest or butt
- Pimples
- Loss of hair
- Difficulty in conceiving
- Pain in the pelvic area
- Fear and sadness

DIAGNOSIS AND TREATMENT OF PCOS

Diagnosing PCOS

Abdomen exam: look over reproductive organs for mass, width and other changes

Blood tests: Hormone levels can be examined by blood tests. And other levels like cholesterol, Tolerance of glucose.

Ultrasound: Look over ovaries and thickened lining. The transducer emits sound waves that are Translated into images on a computer screen.

Tests you may have include
- Prolactin level
- Pregnancy test.
- Lipid/cholesterol levels
- LH (luteinizing hormone) and FSH (follicle stimulating hormone) levels.
- Testosterone level

TREATMENT
The treatment of PCOS is mainly included as follows:
- Weight loss,
- Dietary changes,
- Medications to treat acne and excessive hair growth
- Medications to improve insulin sensitivity,
- Fertility therapy

i) MEDICATIONS
To regulate your periods, the physician might recommend the following:
- **Combined birth control pills: These are the** pills that contains both progestin and estrogen which decrease androgen production and regulates the estrogen. Hormonal regulation can decreases the risk of endometrial cancer and corrects irregular bleeding and also excessive hair growth, acne.
- **Progestin therapy:** Taking progestin for 10 to 14 days for every 1 to 2 months can regulate your periods and protect against endometrial cancer. This progestin therapy doesn't improve androgen levels and won't prevent pregnancy.
- To help you ovulate so that you can become pregnant, your physician provider might recommend:
- **Clomiphene.** This oral anti-estrogen medication is taken during the first part of your menstrual cycle.
- **Letrozole (Femara).** This breast cancer treatment can work to stimulate the ovaries.
- **Metformin.** Usually this medicine is for type 2 diabetes that you take by oral route that improves insulin resistance and lowers insulin levels. If you don't become pregnant using clomiphene, your provider might recommend adding metformin to help you ovulate. If you have pre-diabetes, metformin can slow the progression to type 2 diabetes and help with weight loss.
- **Gonadotropins.** These are injectable hormones.
- To improve acne and reduce excessive hair growth, the following are recommended:
- **Birth control pills.** These pills decreases the androgen production, leading to reduce of excessive hair growth and acne.
- **Spironolactone (Aldactone).** This medication blocks the effects of androgen on the skin, which includes excessive hair growth and acne. Spironolactone can cause birth defects, so effective birth control is needed while taking this medication. This medication isn't recommended if you're pregnant or planning to become pregnant.
- **Hair removal.** Laser hair removal and electrolysis are two options for removing hair.
- **Acne treatments.** Medications, including pills and topical creams or gels.

ii) Lifestyle Modification and Non-Pharmacological Approaches
Weight Loss:
- Due to excessive production of androgens leads to weight gain in women with PCOS especially in the abdominal area. Many studies shows that even a 5% to 10% weight loss can regulates the regular menstruation cycle. The women who are obese, the best way is to get normal body mass index (BMI).

Diet:
- An ideal diet should be low in saturated fats and carbohydrates and rich in fibers. Patients should also be aware that foods with a high glycemic index for prevention, chips, fries, cookies, cakes, white rice, and some fruits such as pineapple or watermelon are actual examples.

There is a carbohydrate classification considering the blood glucose response they cause within 2 h: low and high glycemic index carbohydrates. Low glycemic index carbohydrates are at the top of our agenda; they include foods and vegetables like broccoli, raw carrot, lentils, soy, breakfast cereals, whole-grain bread, etc.

Exercise

Physical activity and exercise plays a vital role in weight reduction. Insulin sensitivity can be improved by physical activity. The American Heart Association (AHA) recommends approximately 2 hrs. 30min of moderate or 1 hr. 15 min of vigorous and intense exercise per week. Several studies show that exercise, with or without being on a diet, can resume ovulation in women with PCOS. Exercise can affect ovulation through modulation of the hypothalamic-pituitary-gonadal (HPG) axis [20].

Acupuncture

In china for more than 3000 yrs.' acupuncture is a fundamental part of CAM (Complementary and alternative medicine). It is a kind of sensory stimulation in which thin needles are placed into the skin and muscles. Acupuncture improves clinical manifestations of PCOS by activating somatic afferent nerves of the skin and muscles, modulating somatic and autonomic nervous system activity and endocrine/metabolic functions.

Supplementations

- Vitamin D supplement
- Resveratrol,
- α-lipoic acid,
- Omega-3,
- Berberine,
- Folic acid,
- Myoinositol (MI),
- D-chiro-inositol (DCI).
- **Vitamin D** is very effective especially in cold seasons of the year, just compensatory amount is suggested.
- **Resveratrol** is among the most recommended supplements for the treatment of PCOS. It is assumed to possess neuroprotective, cardioprotective, antioxidant, and anti-inflammatory effects. Its action is by inhibiting HMG-CoA reductase expression and activity, just like statins. Clinical use of this product has been shown to reduce insulin resistance and the risk of type 2 diabetes development.

Alpha-lipoic acid

Usually, women's lipid profile is improved by the two supplements namely omega-3and alpha-lipoic acid and insulin sensitivity through their anti-inflammatory and antioxidant properties.

- **Berberine** is a nutraceutical compound which have desirable and possible effects against insulin resistance and obesity & particularly against visceral adipose tissue (VAT).
- **Folic acid** is usually an agent given to PCOD those who are seeking fertility.
- **Myoinositol (MI):** It corrects hormonal imbalance, improves insulin resistance, ovulation, and overall ovarian function.
- **D-chiro-inositol** (DCI): it has widely used in clinical practice to induce ovulation in clinical practice to induce ovulation in women with polycystic ovary disease.

III. Methodology

Study design: A Prospective Comparative study.
Study site: Department of Gynecology at a tertiary care teaching Hospital SBMCH&RI, Renigunta.
Study duration: 6 months.
Study sample size: 50 PCOD patients.

Inclusion criteria:

- From puberty age to menopause period.
- Symptomatic with irregular menstrual cycle and infertility.
- Consent and compliance with all aspects of the study protocol, methods, providing data during follow-up contact.

Exclusion criteria:

- Pregnant, lactating women are excluded.
- subjects who may not provide complete information.
- Patient with severe complications is avoided.

Study Material:

- Patient informed consent form [annexure-1].

- Patient data collection proforma [annexure -2].

Data collecting method:

Patient information relating to age, gender, Co-morbities, LMP, blood pressure, heart rate, sleep were collected from patients attending the gynaecology department in SBMCH&RI, Renigunta. The patients were asked to provide the information after signing the informed consent form. The patients were asked to provide information regarding their physical activity and food habits. The patients were asked to provide past medication history of any hormonal pills and any other medications usage. the past medical history like thyroid problems and genetical history were taken. Past lab parameters were collected from case reports based on last menstrual cycle of every patient was taken.

IV. Results And Discussion

Study was conducted for 50 patients with the diagnosis of polycystic ovarian disease who are under the management of oral contraceptive pills and multivitamins at department of Gynaecology SBMCH&RI hospital, Renigunta, for a period of 6 months and the data was collected. Data collection forms of 50 patients were obtained.

TABLE 1: DISTRIBUTION BASED ON SUBJECT'S AGE GROUP

S.NO	AGE GROUPS (IN YEARS)	NO. OF PATIENTS
1	16-20	9
2	21-25	17
3	26-30	10
4	31-35	6
5	36-40	4
6	41-45	3
7	46-50	1
TOTAL		**50**

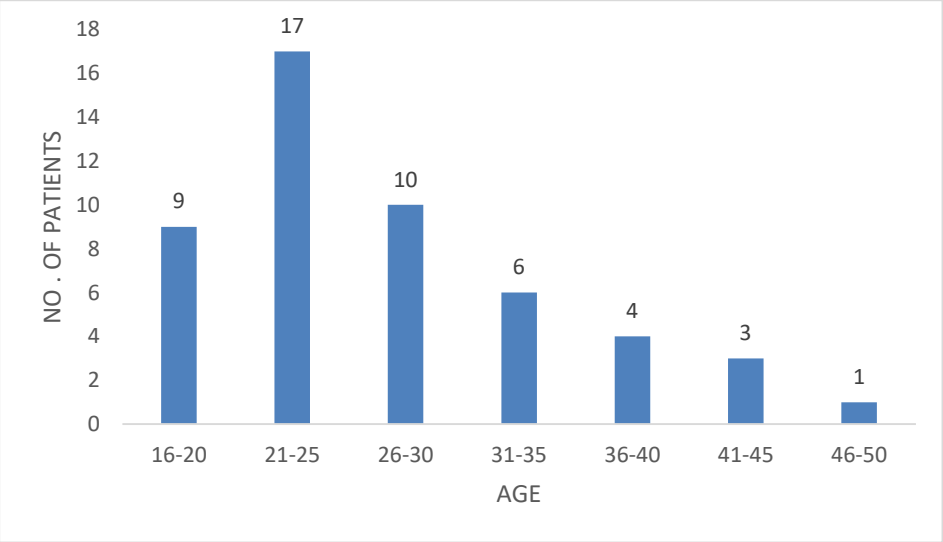

FIGURE 7: GRAPH BASED ON AGE VS NO. OF PATIENTS

Based on this study, we found that maximum number of patients were in the age group of between 21-25 years among 50 patients.

TABLE 2: DISTRIBUTIONS OF PATIENTS BASED ON PAST HISTORY

S.NO	PATIENT MEDICAL HISTORY	NO. OF SUBJECTS
1	THYROID	11
2	HYPERTENSION	1
3	LAPROSCOPIC DRILLING	3
4	DM	2
5	PCOD	8
6	OTHERS	25
	TOTAL	**50**

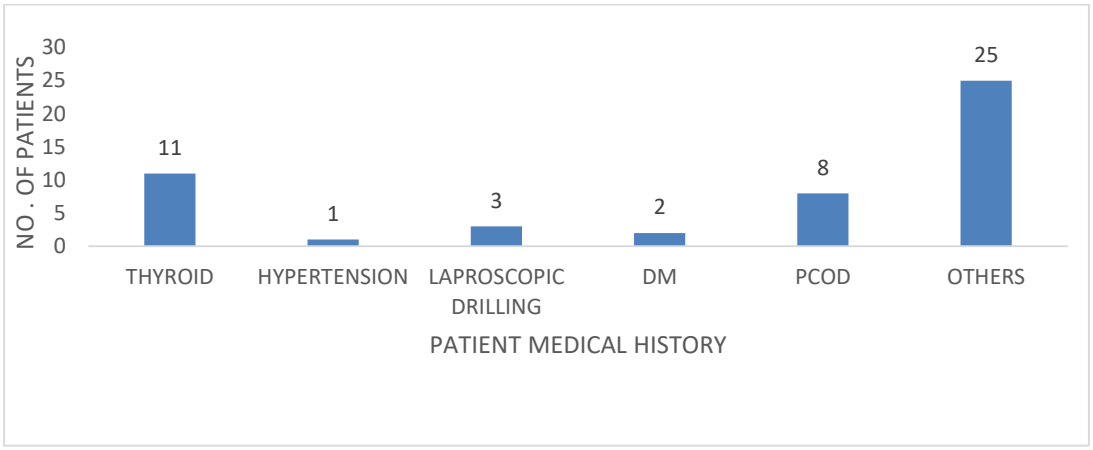

FIGURE 8: GRAPHS BASED ON PAST HISTORY

In this study we found that past history of thyroid n-11, were most common among 50 patients, followed by the PCOD n-8, laproscopic drilling n-3, Diabetes n-2, hypertension n-1.

TABLE 3: DISTRIBUTION OF SUBJECTS BASED ON COMORBIDITIES

S.NO	COMORBIDITIES	NO. OF SUBJECTS
1	THYROID	14
2	HYPERTENSION	1
3	DIABETES	2
4	OTHERS	33
	TOTAL	**50**

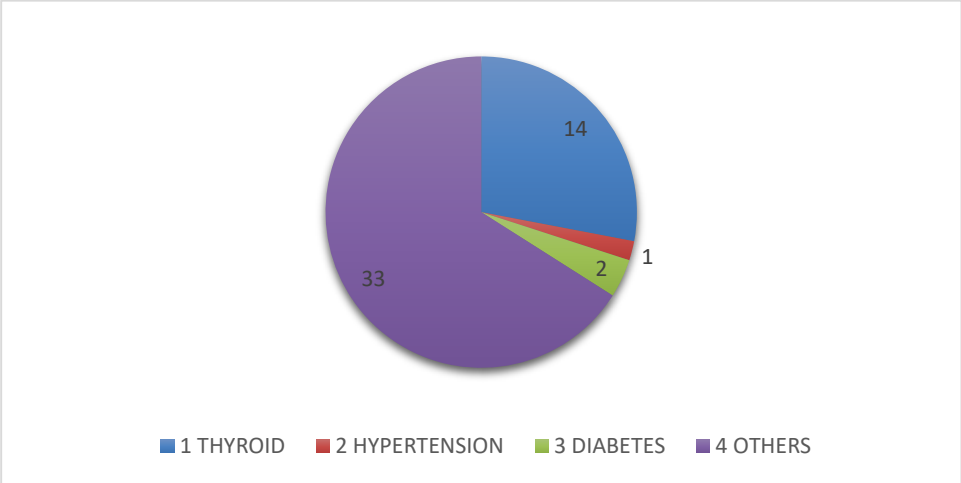

FIGURE 9: PIE CHART OF PATIENTS BASED ON COMORBIDITIES

In this study we found that thyroid n-14 was the most common comorbidity followed by Diabetes n-2 and Hypertension n-1 and patients sharing no comorbidities among them are n-33.

TABLE 4: DISTRIBUTION BASED ON CHIEF COMPLAINTS

S.NO	CHIEF COMPLAINTS	NO. OF PATIENTS (50)
1	IRREGULAR PERIODS	50
2	ACNE	10
3	INFERTILE	8
4	ABDOMINAL PAIN	9
5	WEIGHT GAIN	14
6	HIRSUTISM	5

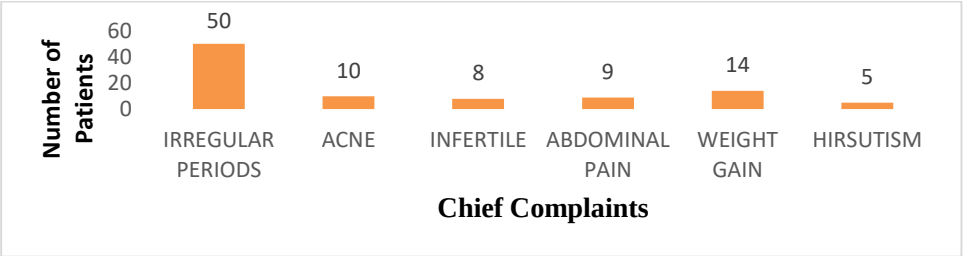

FIGURE 10: GRAPH BASED ON CHIEF COMPLAINTS

Based on this study we found that the patients have irregular periods (n-50) was the most common chief complaints among 50 patients. along with them weight gain (n-14), acne n-(10), was moderately have and abdominal pain n-(9), infertile n-(9), hirsutism n-(5), was least having chief complaints among 50 patients.

TABLE 5:DISTRIBUTION BASED ON TREATMENT OPTIONS

PRESCRIBING PATTERN OF ORAL CONTRACEPTIVE PILLS			
S.NO	**NAME OF DRUG**	**NO. OF PATIENT**	**PERCENTAGE (%)**
1	REGESTRONE	10	40%
2	OVRAL	6	24%
3	OVRAL + REGESTRONE	5	20%
4	MALA-N	1	4%
5	OVRAL + MODUS	1	4%
6	OVRAL + CLOMIPHENE CITRATE	2	8%
	TOTAL	**25**	**100%**

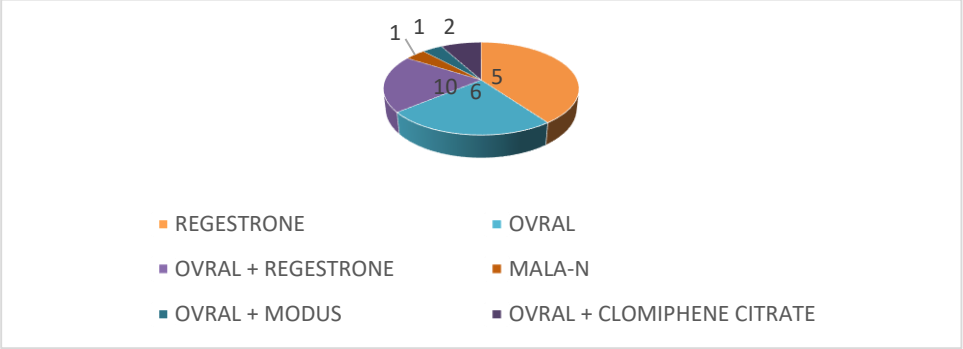

FIGURE 11: PIECHART BASED ON PHARMACOTHERAPY

It shows that most of the patients on medication of Regestrone n-10 were high whereas followed by Ovral n-6, Ovral and Regestrone n-5, and Ovral + clomiphene citrate n-2 Ovral + modus n-1 here other subjects were not on medication of oral contraceptive pills n-25 among 50 patients

TABLE 6: DISTRIBUTION OF SUBJECTS BASED ON MULTIVITAMINS

PRESCRIBING PATTERNS OF MULTIVITAMINS			
SI.NO	**NAME OF DRUG**	**NO. OF PATIENT**	**PERCENTAGE (%)**
1	ZINCOVIT	1	4%
2	CO-E-PREG	4	16%
3	TRAZER-F-FORTE + ZINCOVIT	5	20%
4	CO-E-PREG + TRAZER-F-FORTE	5	20%
5	OVALEAD + COE-PREG	3	12%
6	ZINCOVIT + COE-PREG	6	24%
7	ZINCOVIT + COE-PREG + TRAZER-F-FORTE	1	4%
	TOTAL	**25**	**100%**

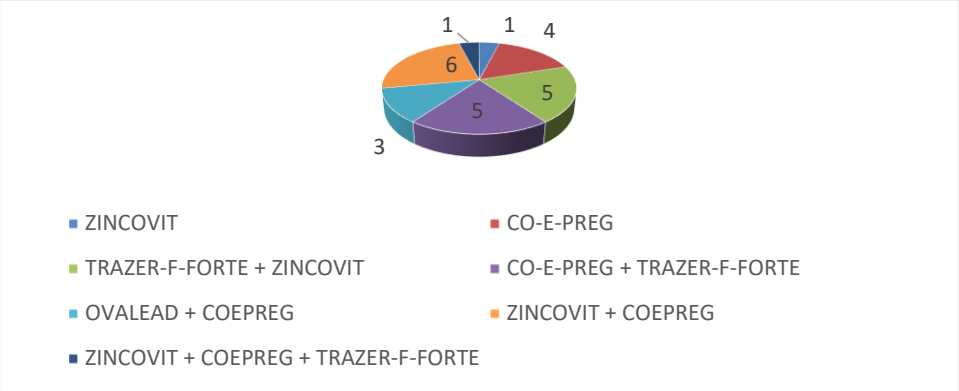

FIGURE 12: PIECHART ON MULTIVITAMINS

This study shows that most of patients are using multi vitamins are Zincovit + Coe-preg n-6, followed by moderately Trazer-F-Forte +Zincovit) n-5, and Coe-preg + Trazer-f-forte n-5, were used along them Coe-preg n-4 were used and least of Ovalead +Coe-preg n-3 and Zincovit n-1, Zincovit + Coe-preg + Trazer-F-Forte n-1 among 25 patients.

TABLE 7: DISTRIBUTION BASED ON ORAL CONTRACEPTIVES VS MULTIVITAMINS

PRESCRIBING PATTERNS OF ORAL CONTRACEPTIVE PILLS VS MULTIVITAMINS			
S.NO	**NAME OF DRUG**	**NO. OF PATIENT**	**(%)**
1	REGESTRONE	10	20
2	OVRAL	6	12
3	OVRAL + REGESTRONE	5	10
4	MALA-N	1	2
5	OVRAL + MODUS	1	2
6	OVRAL + CLOMIFENE CITRATE	2	4
7	ZINCOVIT	1	2
8	CO-E-PREG	4	8
9	TRAZER-F-FORTE + ZINCOVIT	5	10
10	CO-E-PREG+TRAZER-F-FORTE	5	10
11	OVALEAD + CO-E-PREG	3	6
12	ZINCOVIT + CO-E-PREG	6	12
13	ZINCOVIT + CO-E-PREG + TRAZER-F-FORTE	1	2
	Total	**50**	**100**

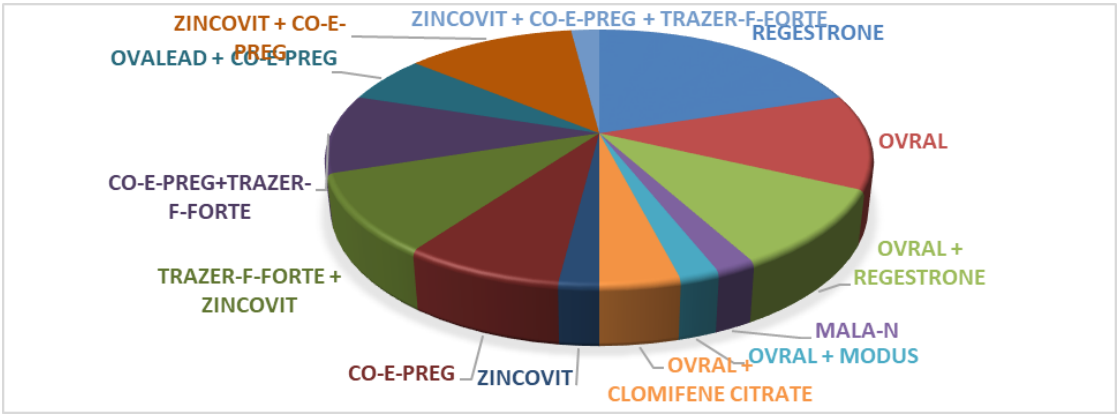

FIGURE 13: PIE CHART OF ORAL CONTRACEPTIVES VS MULTIVITAMINS

In this study we found that Regestrone n-10 was highly prescribed among 50 patients and Ovral n-6, and Ovral + Regestrone n-5, were mildly used oral contraceptive pills whereas Zincovit +co-e-preg n-6, Coe-preg, Trazer forte n-5, Trazer-f-forte + Zincovit n-5, was commonly used multivitamins among 50 patients.

TABLE 8:CHARACTERISTICS OF PCOD PATIENTS WITH TREATMENT VS MULTIVITAMINS

S.NO	PARAMETERS	WITH TREATMENT (Mean + Sd) N= 25	WITHOUT TREATMENT (Mean + Sd) N=25	P-VALUE
1	AGE	3.71±3.35	3.57±2.50	0.92
2	COMORBIDITIES (HTN, DM, THYROID)	1.66±1.15	4±5.19	0.42
3	PAST HISTORY	1.8±1.92	3.5±3.04	0.15
4	CHIEF COMPLAINTS	6.16±9.32	8±8.17	0.11

- According to our study paired t-test was applicable.
- Based on our study we found that past history (0.15), chief complaints (0.11) and co-morbidities(0.42) obeys the p-value . so, these are significant to our study
- Whereas age parameter (0.92) was not significant.

V. Discussion:

1. According to ***Khaleda Khanam and et., al (2014)*** had found that the role of insulin resistance, hyper insulinemia and insulin like growth factor 1(IGF-1) in development of syndrome. Abnormality of hypothalamic-pituitary-ovarian or adrenal axis has been implicated in PCOD. In this study elevated gonadotrophin ratio was found in 62% cases. In our findings 35% patients have the past history of HTN, DM, and THYROID had more prone to PCOD.
2. According to ***Neha Minocha and et, al (2020)*** had found that in PCOD condition ovaries get enlarged and starts producing excess amounts of male hormones (androgens) and is the, main cause of infertility, diabetes, irregular periods and hirsutism. And also concluded that by using oral contraceptive pills can prevent 50% of these conditions. In our findings 80% 0f patients using oral contraceptive pills along with life style modifications can prevent PCOD.
3. According to ***Erin K. Barthelmess and et., al (2015)*** had found that, in Rotterdam criteria phenotype, hyper androgenism and anovulation can detect the PCOD. It is more prevalent in young reproductive age women 6 to 10%. In our findings not only Rotterdam criteria but also national institute of health (NIH criteria) and AEPCOS criteria can also detect PCOD. It can be prevalent in young reproductive women.
4. According to ***Jeshica Bulsara and et., al (2021)*** had found the central mechanism is difficult to understand there is no treatment to claimed as a magic bullet as it targets the clinical symptoms rather than curing the syndrome. Alternative drugs like herbal medicines can cure the PCOD, But in our finding mechanism based on 6 schemes according to gynecology Datta book. And no other medicines cannot cure the PCOD only oral contraceptive pills (OCPS) can regulate the hormonal menstrual cycle.
5. According to ***Jorge E. Chavvarro and et, (2008)*** had found that the association between used multi vitamin supplements and risk of ovulatory infertility and found that using these supplements at least 3 times per week was associated with a reduced risk of ovulatory infertility. Results suggested that vitamin-B particularly folic acid can reduce ovulatory infertility. In our findings by using multivitamins for 25 subjects cannot reduce the infertility and PCOD. Multivitamins like Zincovit, co-e-preg, and Trazer-f-forte. By using oral contraceptive pills (OCP) in 25 subjects, we asses that they can regulate cycle regularly and reduce infertility by 20%.
6. According to ***Khaleda Khanam and et., al (2014)*** had found that the role of insulin resistance, hyper insulinemia and insulin like growth factor 1(IGF-1) in development of syndrome. Abnormality of hypothalamic-pituitary-ovarian or adrenal axis has been implicated in PCOD. In this study elevated gonadotrophin ratio was found in 62% cases. In our findings 35% patients have the past history of HTN, DM, and THYROID had more prone to PCOD.
7. According to ***Neha Minocha and et, al (2020)*** had found that in PCOD condition ovaries get enlarged and starts producing excess amounts of male hormones (androgens) and is the, main cause of infertility, diabetes, irregular periods and hirsutism. And also concluded that by using oral contraceptive pills can prevent 50% of these conditions. In our findings 80% 0f patients using oral contraceptive pills along with life style modifications can prevent PCOD.
8. According to ***Erin K. Barthelmess and et., al (2015)*** had found that, in Rotterdam criteria phenotype, hyper androgenism and anovulation can detect the PCOD. It is more prevalent in young reproductive age women 6 to 10%. In our findings not only Rotterdam criteria but also national institute of health (NIH criteria) and AEPCOS criteria can also detect PCOD. It can be prevalent in young reproductive women.

VI. Conclusion

We concluded that among 50 patients under treatment, The maximum number of patients were in age group between 16-50 years are prone to PCOD.

- ❖ Most of the patients were having a comorbidity of hypertension (1), thyroid (14) followed by diabetes (2).
- ❖ Most of them are educated.
- ❖ Significance of our study include we have performed this study in PCOD patients who are maintained under the treatment i.e., 25 subjects under pharmacological therapy, and 25 subjects under Multivitamins.
- ❖ Treatment subjects are more effective in regulating their menstrual
- ❖ Cycles than compared to multivitamin subjects.

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