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RESEARCH ARTICLE

ROLE OF HYPOTHYROIDISM & PCOD IN FEMALE INFERTILITY.

Dr. L. Santhanalakshmi.

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Abstract

Introduction:-

Infertility is defined as the inability to become pregnant after 12 months of regular, unprotected intercourse. Among couples 15-44 years of age, nearly 7 million attend infertility clinics **Chandra et al.** Etiology of infertility – combined factors -40%, male factors-26-30%, ovulatory dysfunction 21-25%, tubal factors-14-20%, uterine, cervical, peritoneal factors-10-13%, unexplained 25-28% **Thonnaeu et al.**

Prevalence of PCOS has been established to be 15-20 % globally(**Diamanti et al**, **Simrans).** Patients present with a wide spectrum of clinical signs & symptoms of reproductive function - irregular menses, chronic anovulation, oligomenorrhea, amenorrhea, hirsuitism, metabolic-weight gain(**Motta ,Gambineri et al**), pigmentation around neck, arm pits or thighs, oily skin, excess facial hair, insulin resistance in skeletal muscles **Rezzonico et al,** impaired glucose tolerance, type 2 DM, cardio vascular disorders etc.,& psychological features including increased anxiety, depression **Legro et al**.

Defect in Hypothalamo pituitary axis, dysfunction and anatomic abnormalities of the Thyroid and hypersensitivity of adrenal and ovarian tissue to Insulin seems to be adversely affected by associated Thyroid dysfunction.

Polycystic Ovarian Syndrome is the most common endocrinopathy of women in the reproductive age group which is associated with Thyroid dysfunction. Subclinical Hypothyroidism (SCH) characterised by elevated serum levels of Thyroid stimulating hormone (TSH) is considered as an important risk factor for many endocrine disorders **Surks et al**. Abnormalities in the supply of the Thyroid hormone to the peripheral tissues are associated with alteration in a number of metabolic processes. Early stages of Thyroid dysfunction before symptoms are obvious can lead to subtle change in ovulation and endometrial receptivity, which may have profound effect on fertility. In Primary Hypothyroidism , secondary depression of pituitary function may lead to ovarian atrophy and amenorrhoea.

A typical PCOS ovaries has multiple cysts with a chain of pearl manifestations which leads to hormonal imbalances resulting in infertility.

Aim And Objectives:-

1. To correlate TSH on age and BMI matched infertile PCOD patients with general population.
2. To correlate duration of marital status with Thyroid function

Corresponding Author:- Dr. L. Santhanalakshmi.

Materials And Methods:-

After getting Ethical Committee approval from Institution, informed consent obtained from all participants after detailed explanation.

Height in centimetres measured with stadiometer and weight of the subjects in kilograms by the weighing machine were used for calculating BMI. BMI calculated using Quetelet 's Formula and the results expressed in kg/m^2.

10 ml of venous blood samples were collected from all participants. Serum thus separated used for assessing TSH levels by Elisa method according to standard protocol **Wistom GB**.

For around 50 patients transabdominal pelvic ultrasound was done to detect the presence of cystic ovaries. USG proven PCOD attending Infertility clinic in Obstetrics Department of Government Rajaji Hospital attached to Madurai Medical College participated as study group and another 50 parous women of the same age group attending Endocrinology Department with problems unrelated to PCOS or Thyroid dysfunction and with normal menses were considered as control group.

Inclusion Criteria:-

Women in reproductive age group living with their spouse with unprotected coitus, anxious to conceive .Infertile women with menstrual irregularities.

Exclusion criteria:-

Women on medications for Hyperprolactinemia, Hypothyroidism, Androgen excess, Cushing's syndrome, oral contraceptives for cycle regulation were excluded.

Observations and Results:-

Rotterdam classification was used to define PCOS in the event of

1. Menstrual abnormalities like Amenorrhoea (no cycles in the past 6 months)
2. Oligomenorrhoea (long cycles with scanty menses)
3. Ultra sound appearance of polycystic ovaries (multiple cysts > 12 in number of 2-9 mm in size.

Statistical Analysis:-

was done using Chi Square test using appropriate software (SPSS 16version) and sigma stat 3.5version.

Results:-

This case control study revealed statistically that mean age in years was 28.2 for cases and 26.8 for controls with p value 0.247, with BMI 0.720 and duration of marital status had 0.451which is insignificant.

It showed a significant p values of < 0.001for menstrual cyclical irregularities and also abnormalities in menstrual cycles.

There was a 0.005 significant p value for TSH. At the same time, Hypothyroidism with PCOD revealed a non significant p value of 0.452.

In the age group of 26-30 years, the number of cysts showed a 0.003 significant p value.

Discussion:-

PCOS is the most common cause for female infertility characterised by a combination of hyperandrogenism, chronic anovulation and irregular menstrual cycles (**Asuncion M et al).**

Prevalence of Hypothyroidism in adults is around 10.95 % in India. 8.02 % of these patients are diagnosed to have subclinical Hypothyroidism with TSH > 5.50 µiu / ml. Untreated hypothyroidism contributes to Hypertension, Infertility, Dyslipidemia, Cognitive impairment & neuromuscular dysfunction **Garber J.R. et al**. Women with Hypothyroidism have significant higher BMI which influence Thyroid hormone concentration with high TSH levels in obese women **Reinehr et al**.

Adipose tissue is a major endocrine gland secreting and releasing adipokines which have metabolic and / or inflammatory effects on many tissues **Rondinone CM.** Thyroid hormone enhances insulin sensitivity, reduce hyperglycemia and hyperinsulinemia. Disturbed Thyroid function is associated with ovarian dysfunction which results in infertility, early pregnancy loss and morbidity during pregnancy **Poppe et al**. Severe Hypothyroidism may be associated with diminished libido and failure of ovulation. **Wasim et al**, hypothesised that Hypothyroidism worsens PCOS by decreasing sex hormone binding Globulin levels, increases the conversion of androstenedione to testosterone and aromatisation to estradiol and reduces the metabolic clearance rates of androstenedione and estrone.

Since thyroid hormones are involved in the Gonadotropin induced estradiol and progesterone secretion by the human granulosa cells, Hypothyroidism would interfere with ovarian function and fertility.

Conclusion:-

Thyroid disorders in PCOS patient can initiate, maintain or worsen the syndrome **Sridhar et al. Ghosh et al** suggested that Hypothyroidism led to lowering of sex hormone binding globulin level and increment of Testosterone level but not oestriol overproduction.

Women in WHO group II, who are overweight and have PCOD, can benefit from weight loss, Life style correction, regular exercise, avoiding junk foods, hormone fed chicken, processed food, regularising healthy sleep pattern, medication to lower insulin resistance etc., to restore ovulatory cycles and achieve pregnancy **Vause TD et al.** Aiming for a BMI less than 30 kg / m^2 to improve their chances of natural conception or using assisted reproductive technology **Clark AM et al.**

Mother is the most sweetest word in the universe. Hence PCOS demands immediate attention & improving insulin sensibility, lowering triglycerides , intervention to get ovulatory cycles, improving ovulation, egg quality & conceive for safe pregnancy.

Early correction of Hypothyroidism in the management of Infertility associated with PCOD is recommended. If left unattended & untreated, may lead to Infertility, Diabetes & Endometrial cancers in the years to come.

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