Original Research

Estimation & Comparison of CRP and C3 Inflammatory Marker in PCOS & Healthy Women

Dr. Rajju Tiwari[1], Dr. P. Adhikari[2], Dr. Anjana Niranjan[3], Dr. Sanjeev Kumar[4], Dr. Indra Prasad Adhikari[5], Dr. Shreya Nigoskar[6], Dr. Yisha Sharma[7]

[1]Assistant Professor, Department of Biochemistry, Government Medical College, Datia, Madhya Pradesh, India
[2]Associate Professor, [4]Assistant Professor, Department of Community Medicine, Government Medical College, Datia, Madhya Pradesh, India
[3]Assistant Professor, Department of Community Medicine, SRVS Medical College, Shivpuri, Madhya Pradesh, India
[5]Tutor, Department of Biochemistry, S K S Medical College, Mathura, Uttar Pradesh, India
[6]Professor, Department of Biochemistry, Index Medical College, Indore, Madhya Pradesh, India
[7]PG Resident, Department of Biochemistry, Government Medical College, Datia, Madhya Pradesh, India

Corresponding Author
Dr. Sanjeev Kumar
Assistant Professor, Department of Community Medicine, Government Medical College, Datia, Madhya Pradesh, India
Email: dr.sanjeev19@gmail.com

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ABSTRACT

Introduction- Polycystic ovary syndrome (PCOS) is a disease, which is associated with metabolic syndrome like insulin resistance, abdominal obesity and cardiovascular disease. Since insulin resistance leads to chronic inflammation and it is well known that insulin resistance is present in PCOS, so that this study is aimed to see the level of inflammatory marker in the form of CRP and C3 complement in PCOS patient in comparison to age matched healthy women. **Aim & Objectives-** To estimate & compare the level of CRP and C3 complement in blood of PCOS and matched healthy women. **Material & Methods-** This was hospital based cross-sectional prospective study carried out in the Department of Obstetrics & Gynecology along with collaboration Biochemistry department of Index Medical College and Research Center, Indore. Study period was from1st January 2018 to 31st December 2019.A total 260 women of age between 15-45 years were included in the study were divided into two groups cases and control. Out of 260, 130 were diagnosed for PCOS and included in case study group and rest 130 were healthy women without any history of PCOS. Approximately 5ml overnight fasting blood sample was collected in red vaccutainer for CRP and C3 assessment from each participant. **Result-** The mean±SD of BMI in cases and controls were 32.97±8.466 and 22.87±2.470 respectively. The mean±SD for serum C3 complement was 160.66±29.155 and 127.48±35.60 for cases and control respectively, and for CRP it was 2.41±0.94 and 2.25±0.83 for cases and controls respectively. The level of C3 found statistically significant difference between the cases and controls. **Conclusion-** In the present study, result showed that the level of C3 was significantly higher in PCOS cases than control, and CRP in the PCOS group was more than control group but found not significant. The implementation of the results of the present study will help to ease the life of individuals living with PCOS

Key words- PCOS, C3 complement, CRP

INTRODUCTION

Polycystic ovary syndrome is the most common endocrine disorder in premenopausal women and leads to an increased prevalence of insulin resistance, hypertension and cardiovascular disease.[1] Polycystic ovarian syndrome (PCOS) is a common endocrine disorder in women during reproductive age characterised by chronic oligomenorrhea (fewer than nine menstrual periods per year), amenorrhea (no menstrual periods for 3 or more months), anovulation, obesity, hirsutism, hyperandrogenism, and numerous follicular cysts in enlarged ovaries. Globally and in India the prevalence rate of polycystic ovarian syndrome (PCOS) is 7% and approximately 4-11% respectively, in women with reproductive age group. Stein and Leventhal noticed the association between amenorrhea, hirsutism, and enlarged polycystic ovaries, and hence was also named as the Stein

Leventhal syndrome, first described PCOS in 1935. [2,3] Insulin resistance is accompanied by a state of chronic low-grade inflammation, characterized by increased levels of C-reactive protein , interleukin-6 , tumour necrosis factor-α and complement component-3.[4,5] Complement protein studies in PCOS have been conflicting, with some confirmatory studies reporting that C3 is elevated and related to inflammation[6], whilst others report that C3 levels are unchanged[7] it was found that serum C3 levels are strongly associated with insulin resistance after adjustment for obesity [8] and hence mandating a need for a marker to identify low grade inflammation before the onset of complications in these women so the present study is conducted

I.

OBJECTIVE

This study was carried out with the objective of to estimate the level of CRP and complement C3 in serum of women with PCOS and healthy control group & to compare both CRP & Complement C 3 among both of the group.

II.

MATERIAL AND METHODS

Study Type-This was hospital based prospective comparative study.

Study Area- carried out in the Department of Obstetrics & Gynecology along with Biochemistry department of Index Medical College and Research Center, Indore.

Study period- was from1st January 2018 to 31st December 2019.

Sample Size- A total 260 women of age between 15-45 years were included in the study out of which 130 was newly diagnosed cases of PCOS,based on the Rotterdam criteria (menstrual cycle abnormalities, clinical and biochemical diagnosis, USG findings), and rest 130 were age and BMI matched healthy women.

Inclusion Criteria- the women with BMI <30 were included in this study since BMI have association with PCOS, so that in current study, we tried to overcome this confounding factor by matching patients for BMI.[9]

Exclusion Criteria-The following exclusion criterias were applied during enrolment of participants in the current study-

Androgen-secreting tumors, congenital adrenal hyperplasia, thyroid dysfunction, hyperprolactinemia, Cushing's syndrome and diabetes mellitus were ruled out in all subjects.

None of the women were suffering from any other disease, including recent infectious diseases or had been taking oral contraceptives.

Estimation of C3 and CRP- for C3 assessment immuno turbidimetric assay principle was used and for CRP assessment slide agglutination test principle was used.

Data collection tool- semi structured questionnaire proforma used.

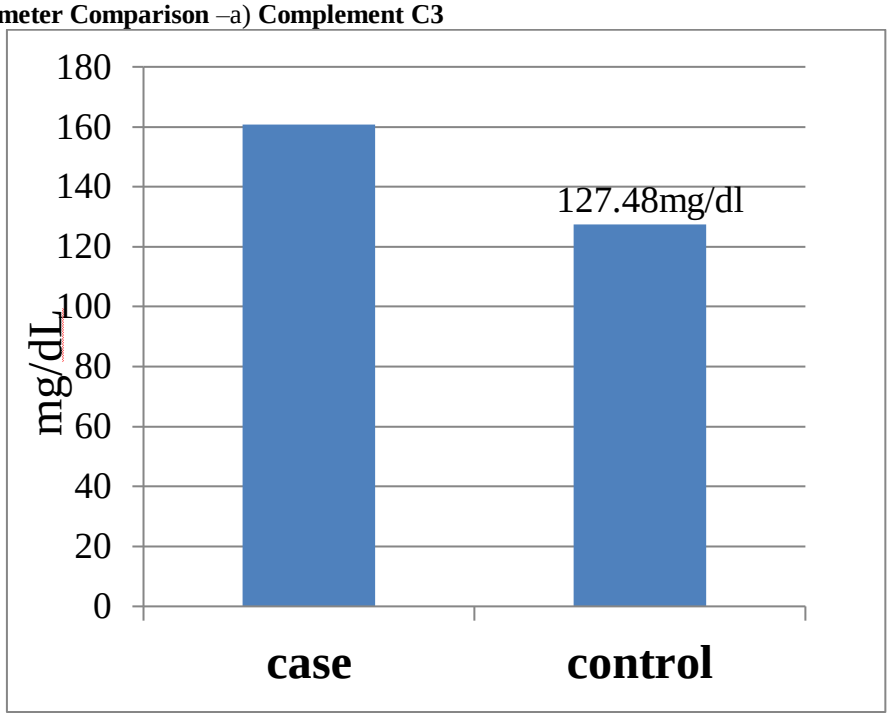
S**tatistical analysis**- a ms excel & GraphPad was used. The value of P was considered statistically significant, when it came <0.05.

RESULTS

Table: 1- Age group comparison

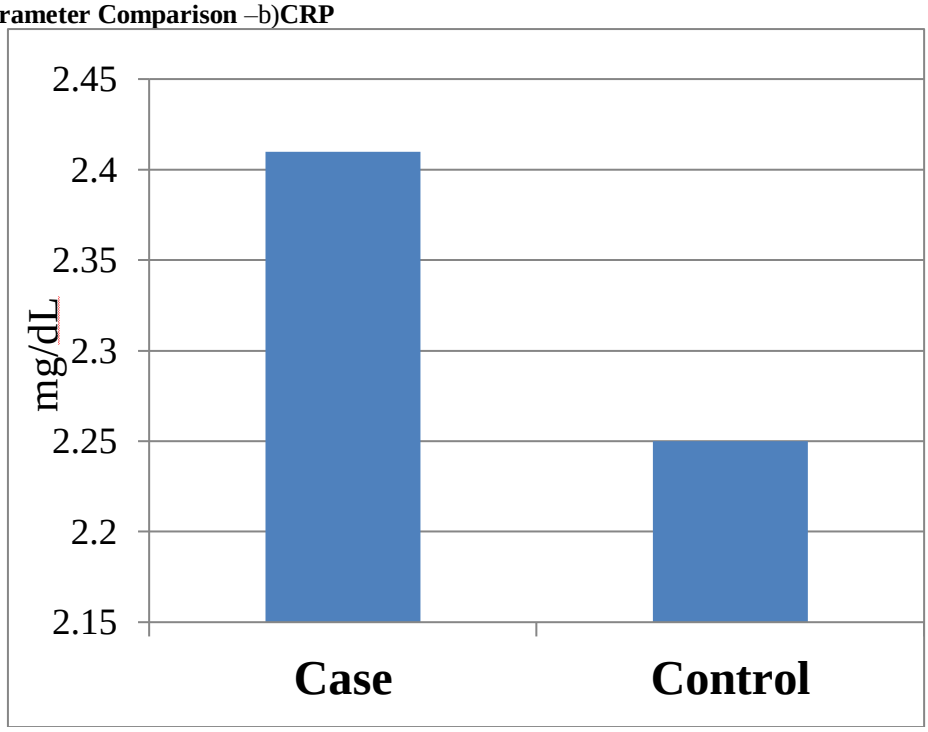
S.N.	Age group	Case	Control	Total
1	16-20	12(9.2%)	11 (8.5%)	23
2	21-25	53(40.8%)	38 (29.2%)	91
3	26-30	60(46.1%)	46(35.4%)	106
4	31-35	4(3.1%)	22 (16.9%)	26
5	>35	1(0.8%)	13(10%)	14
Total		130(100%)	130 (100.0%)	260
Mean std		25.19±3.54	27.49±5.158	

Image1- Parameter Comparison –a) **Complement C3**



P value-P< 0.05, t test=8.21

Image 2- Parameter Comparison –b)**CRP**



P=0.14, t test=1.45

Current study findings	Other study Findings	Reasons of the key findings
Maximum number of the patients belongs to the age group between 26 to 30 years (46.1%)	Similar by Ramanand et al.[9]	which indicated that the prevalence of PCOS increased with age and is peaked up in the early and mid-twenties of life. [3]
a significant increase of C3 (with p value <.05) in patients with PCOS in contrast to healthy controls while such a difference was not seen with CRP levels	Similar findings by Yang et al.[10] & Dehdashtihaghighat S et al.[4] While study conducted by Wu.et al.[11] showed that C3 levels was found to be	Raised visceral fat may be the mechanism for high level of CRP in PCOS.[12] Yet, the definite cause of CRP increase in PCOS is not known while raised C3 level is may be due to the

	high but non-significant between PCOS women and controls.	hepatic production of C3 which is induced by CRP and adipokines like-factor D, cytokines like interleukin-1 and tumor necrosis factor alpha, which may furthur cause insulin resistance .[13]

Limitation of study-Above variation may be due to the limitation of our study, the sample size which was small to make the finding less generalizable. econdly, we have not assessed visceral fat which might be a

DISCUSSION

The findings of the present study and similar finding from the other key studies are discussed as
factor for raised inflammatory markers in PCOS women.

CONCLUSION

Increased level of CRP and C3 complement in PCOS women than healthy women is suggesting that the inflammatory process are the main factors for the development of complications in PCOS women therefore, more attention should be focussed to identify & prevent any further complications before starting the treatment in these women. More surveys needs to be done in order to have a better result on these markers.

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