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Study of Occurrence of Non-Alcoholic Fatty Liver Disease (Nafld) in Polycystic Ovarian Syndrome (Pcos)

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Abstract

NAFLD along with PCOS was first noted by Brown et al in 2005. Since then, it was opined that NAFLD might be a common accompaniment with PCOS considering the fact that insulin resistance & metabolic symdrome is common in both NAFLD and PCOS. Henceforth, our study was a case control hospital-based type study with a period of 18 months starting from January 2017 ending to June 2018. 50 PCOS patients according to Rotterdam criteria were included with 50 controls. Out of 50 cases of PCOS, 23 were below 30 years and 27 were above 30 years. Overall NAFLD prevalence was found to be 24 % with 8.3% in patients of age 15-30years and 91.7%in patients above 30years which showed the association between age and NAFLD prevalence. Patients of PCOS with age more than 30 years were 15.125 times more likely to become NAFLD positive when compared to participants with age 15-30 years(p=0.03).

1. Introduction

"Various studies have proved that PCOS is the commonest endocrinopathy of premenopausal women affecting nearly 10% of the population". [1,2] furthermore , researchers also concluded with their studies that it was also "associated with significant morbidity for both reproductive and metabolic abnormalities".

"PCOS was first described as a reproductive disorder comprising menstrual irregularity, infertility, hirsutism and enlarged polycystic ovaries, by Stein and Leventhal"[3]. Additionally , studies revealed that increased prevalence of impaired glucose tolerance , diabetes mellitus [4] and dyslipidemia[5] seen in PCOS patients which directly implicates that these patients are at risk for the metabolic syndrome also[6].

"According to some past studies ,insulin resistance plays central role in the pathogenesis of PCOS. In addition to that , a high prevalence of PCOS has been reported in Indian women in studies with high fasting insulin levels and greater insulin resistance compared with Caucasians".[7,8,9]

Through various studies researchers have concluded that NAFLD fatty infiltration is often called as hepatic manifestation of metabolic syndrome (MS) which is characterized by the accumulation of fat in the liver in the absence of excessive alcohol consumption. Studies have also shown that NAFLD infiltration demonstrates histological changes extending from benign simple steatosis to steatohepatitis, progressive fibrosis and cirrhosis. "Furthermore, association of NAFLD with PCOS was first reported by Brown et al."[10] Studies had been revealing from last few years an increase of evidences of association between NAFLD and PCOS. Yet their pathophysiologic link & clinical significance was remain determined. Hence, in order to clarify the issues concerning evaluation and management of these patients. Therefore, our

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study was intended for an early detection of any such alterations in the liver profile of these patients which will possibly help prevent complications like cirrhosis and hepatocellular carcinoma thereby improve the prognosis.

2. Materials and Methods

This is a cross-sectional study comprising 50 patients and 50 controls.

50 female patients diagnosed to have Polycystic Ovarian Syndrome at Adichunchangiri institute of medical Sciences, B.G Nagara were included. PCOS was defined according to the Rotterdam criteria after the exclusion of related disorders, by two of the following three features:

Oligo-or anovulation

Clinical and /or biochemical signs of hyperandrogenism

Polycystic ovaries in Ultrasound scan.

50 age matched controls were taken

Patients with hepatitis B infection hepatitis C infection, alcohol consumption, and diabetics were excluded from the study.

The diagnosis of NAFLD is done

1. With help of imaging study i.e USG abdomen and pelvis

2. With help of NAFLD Fibrosis score9 which include 6 criteria (Age, BMI, hyperglycemia, platelet count, S. albumin, AST/ALT ratio)

3. There is no significant alcohol consumption

4. There should be no competing etiology for steatosis

There should be no co existing causes for chronic liver disease

3. Results

The Prevalence of NAFLD in PCOS patient varies significantly in different population with different life style and genetic background

In the present study presence of NAFLD in PCOS patient is found to be 24 %.

Similarly in other studies presence of NAFLD in PCOS patients is as follows

References	No of patients	Obese patients	PCOS Diagnostic criteria	NAFLD Lab diagnosis	NAFLD USG Diagnosis
Schwimmer et al	70	74%	NIH	30%	-
Cerda et al	41	58.5%	Rotterdam	36%	41.5%
Vassilotou et al	57	36.8%	AES	22.8%	36.8%
Tan et al	186	53.7%	AES	28.7%	61.4%
Present study	100	22%	Rotterdam	24%	24%

Correlation of BMI in study and control group

In the present study BMI of > 30 kg/m2 in the study group was seen in 22% and none were above 30kg/m2 in the control group. BMI of 25- 29.9 kg/m2 in the study group was 78% but in control group was 20%.

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REFERENCE	NO PATIENTS with PCOS and NAFLD	BMI(kg/m2)
JARODI DA et al	18/30	24.7+/- 5.4
ROMANOWSKI et al	101	>28.5+/-6
Present study	11	>30

BMI of 19- 24.9 kg/m2 in study group was 0% and 80% in control group. So in the present study we found that patient with NAFLD had higher BMI compared to control group and similar studies conducted by JARODI DA et al in 2017 found that BMI was higher in patients of PCOS with NAFLD which was 24.7 + 5.4 kg/m2,A study conducted by ROMANOWSKI et al found-out BMI of> 28.5+6 kg/m2 in subgroup of patients of PCOS with NAFLD and 26.1 + 4 kg/m2 in control group

Correlation of ALT levels in study and control group patients

REFERENCE	NO PATIENTS with PCOS and NAFLD	ALT>30IU
Cerda et al	41	ALT>38.5±25.39
Schwimmer JB et al	70	ALT>35 U/L
PRESENT STUDY	35	ALT>30

In this study, ALT of >30 IU was seen in 35 study group patients (77.77%) and 10 in control group(22.22%) ,ALT<30 IU was present in 15 study group (27.27%) and 40 control group patients(72.72%). This showed that people of PCOS with NAFLD had higher ALT levels.

Similar studies by Cerda et al showed that the mean ALT in NAFLD group was 38.95 + 25.39 and patients with only PCOS had 19.96+ 11.76 IU. Study conducted by Schwimmer JB et al in found that ALT was elevated up to 30% of 70 patients evaluated at infertility clinic study and used cut-off value of > 35 IU for screening NAFLD in PCOS patients.

Correlation of NAFLD with age

With respect to age, the most common age group of NAFLD occurrence was seen in women above 30 yrs which accounted 91.7% and rest by 8.3 % in 15 to 30 years (pvalue < .003).

fibroscan

In our study we subjected all experimental and control group patients to fibro scan, majority of experiment al group belonged to F0 to F1 which was 70% followed by 20 % in F2 to F3 followed by 10% belonging to F3 to F4. When compared to control group all had fibro scan of to F0/F1.

4. Conclusion

In this study of occurrence of NAFLD in PCOS, overall occurence of NAFLD in PCOS patient was increased compared to the patient without PCOS. Patient with high BMI, higher ALT score and high NAFLD score with higher age can be considered as risk factors for development of NAFLD in patients with PCOS.

Limitations:

Insulin resistance was not tested in the study Liver biopsy was not done and still larger study was needed for the confirmation and follow up of the cases to know the progression of the disease.

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