The prevalence of ALT among female with Polycystic Ovary Syndrome

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Abstract

Background: For women who are of reproductive age, polycystic ovarian syndrome, or PCOS, is a prevalent endocrine condition. Although PCOS is linked to a higher risk of obesity and insulin resistance, little is known about the incidence of nonalcoholic fatty liver disease (NAFLD) in Japanese women with PCOS and the risk factors associated with it.

Aims of the study: identify the prevalence of ALT among female with polycystic ovarian syndrome.

Methodology: A Descriptive cross-sectional study was conducted between November 2023 to March 2024 was conducted on women with polycystic ovarian syndrome who attended the consultation clinic at Al Batool Teaching hospital.

Result: 25(43.1%) of patient were normal ALT value while 33(56.9%) of sample were ALT value > 33. lean PCOS BMI less than 25, 20(80%) of patients less than 33 while 5(20%) were more than 33.

Conclusion: We conclude that ALT value increase in obese female with PCOS which 56% of obese females with PCOS have high ALT levels, and 20% of lean PCOS females have high ALT levels, which shows the profound relationship between PCOS and liver disease.

Keywords: ALT, polycystic ovary syndrome, NAFLD.

Introduction

PCOS, or polycystic ovarian syndrome, is (1)Chronic anovulation, the existence of polycystic ovaries, and clinical and/or biochemical hyperandrogenism are its defining characteristics. It has been discovered that there is a strong correlation between insulin resistance, metabolic syndrome and PCOS.(2,3)

One of the most significant hepatic symptoms of metabolic abnormalities is nonalcoholic fatty liver disease (NAFLD), which can range from hepatic steatosis, inflammation, fibrosis, to hepatocellular cancer. According to recent reports, women with PCOS had greater prevalence of NAFLD and alanine aminotransferase (ALT) levels than those without PCOS.(4)

But the main theories were that the greater rates of insulin resistance, dyslipidemia, and obesity in PCOS-affected women than in non-PCOS-affected women were the cause. After taking into account the confounding impact of obesity, Cerda et al. (5) revealed that PCOS alone continues to explain for the greater risk of NAFLD and aberrant aminotransferase activity. However, there is a lack of information clarifying whether elevated aminotransferase activity and an increased risk of NAFLD are caused by PCOS. It is uncertain whether other unique variables may be present in women with PCOS and contribute to this phenomena.

There are well-established gender disparities in the frequency of NAFLD and the amount of ALT. After accounting for the impact of obesity, research has shown that males are more likely than women to have elevated blood levels of ALT and a greater risk of NAFLD. (6,7)

Borderline increased ALT levels have also been seen in female-to-male transsexuals after long-term testosterone therapy.(8)

Aspartate aminotransferase (AST) is considered to be a more general sign of liver damage than ALT, a cytosolic enzyme that is sensitive to liver cell injury.(9)

Both obese and nonobese people can have their NAFLD detected using ALT levels. On the other hand, individuals with NAFLD who have histological or clinical symptoms may have normal ALT levels.(10,11) In a recent study, abdominal ultrasonography revealed that 48 (55%) of the 88 PCOS-afflicted women had steatosis; only seven (15%) of the 48 had aberrant liver chemistries. (12) As a result, increased ALT levels in PCOS-afflicted women could indicate more severe liver cell damage.

Aims of the study

The aim of the study was to identify the prevalence of ALT among female with polycystic ovarian syndrome.

Methodology

A Descriptive cross-sectional study was conducted between November 2023 to March 2024 was conducted on women with polycystic ovarian syndrome who attended the consultation clinic at Al Batool Teaching hospital. Inclusion criteria were pregnant women in the first trimester to screen for preexisting Diabetes.

In the analysis, we employed two criteria, one for raised ALT and one for elevated AST levels. The mean and percentile values of the ALT and AST values, which were determined from the study's sample, were used to set the thresholds for ALT and AST levels. ALT more than 16 IU/liter and AST higher than 19 IU/liter were the initial criteria, while ALT greater than 33 and AST greater than 32 were the second.

Adjustment

After collection, data were checked manually and analyzed by computer based program Statistical package of social science(SPSS) 26 version. Results were expressed as mean, or frequency or percentage.

Result

Data were coleected from 83 women with polycystic ovarian syndrome who attended the consultation clinic at Al Batool Teaching hospital. The mean age was 27.18 years, Mean AST were 19.61 IU/L and the mean ALT is 14.23 IU /L. The weight 3(6%) were less than 60 kg, 20(40%) were 60-69 kg, 15(30%) were 70-79 kg and 12(24%) were more than 80 kg.

46(92%) of patients were marriage while 4(8%) of patients were never marriage as shown in table 1.

Table (1): Distribution of demographic data among sample.

Variables	Patients number	Percentage
Age	27.18 years	
AST	19.6 IU/L	
ALT	14.23 IU/L	
Weight		
< 60 kg	6	7.2%
60-69 kg	33	39.8%
70-79 kg	25	30.1%
>80 kg	19	22.9%
Marital status		
Marriage	75	90.4%
Not marriage	8	9.6%%

Table 2 show the prevalence of ALT among PCOS with overweight and obesity, 25(43.1%) of patient were normal ALT value while 33(56.9%) of sample were ALT value > 33.

Table (2): Prevalence of ALT among PCOS with overweight and obesity.

ALT value	N=58	Percentage

Normal ALT	25	43.1%
ALT(> 33)	33	56.9%

Table 3 show lean PCOS BMI less than 25, 20(80%) of patients less than 33 while 5(20%) were more than 33.

Table (3): Lean PCOS BMI less than 25.

ALT	N=25	%
Less than 33	20	80
More than 33	5	20

Discussion

High ALT is a biochemical marker of nonalcoholic fatty liver disease and the higher the ALT the higher percentage of fat in the liver .It turns out that 56% of obese females with PCOS have high ALT levels, and 20% of lean PCOS females have high ALT levels, which shows the profound

relationship between PCOS and liver disease. Further investigations are needed to determine degree of fibrosis in those patients.

A study done by Vassilatou et al.(13) found that elevated liver enzymes, particularly ALT and AST, are prevalent in 33.3% of PCOS-affected women. Different PCOS women have different prevalence rates of high liver enzymes according on the cohorts' features and diagnostic criteria.

15.4% of the 39 teenage PCOS participants in the retrospective research showed increased ALT levels.(14)

A study conducted in Italy by Gambarin et al.(15) using the same diagnostic criteria found that 57.9% of 140 overweight/obese PCOS patients had increased ALT levels (ALT > 19 IU/L).

Conclusion

We conclude that ALT value increase in obese female with PCOS which 56% of obese females with PCOS have high ALT levels, and 20% of lean PCOS females have high ALT levels, which shows the profound relationship between PCOS and liver disease.

Recommendations

Further investigations are needed to determine degree of fibrosis in those patients.