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NON – ALCOHOLIC FATTY LIVER DISEASE IN PATIENTS WITH POLYCYSTIC OVARIAN SYNDROME

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ABSTRACT;

Background; Insulin resistance has been implicated in the pathogenesis of both nonalcoholic fatty liver disease (NAFLD) and polycystic ovary syndrome (PCOS) and different studies documented the role of polycystic ovarian syndrome in development of non – alcoholic fatty liver disease (NAFLD) So this study was conducted in our population to ascertain its frequency in our population as there is no study done in our local poulation. **Material and Methods;** This cross – sectional study was conducted at Department of Obstetrics and Gyncecology, Nishtar Hospital, Multan using non – probability consecutive sampling technique. A total of 117 women with PCOs were included in our study which underwent relevant investigations for NAFLD. All the data obtained was entered and analyzed by SPSS – 16. **Results;** Mean age of our study cases was 31.35 ± 5.67 years. Our study results have indicated that majority of our study cases i.e. 62 (53%) were aged up to 30 years. Of these 117 study cases, 50 (42.7%) belonged to rural areas while 67 (57.3%) from urban areas, 61 (52.1%) were poor and 56 (47.9%) belonged to middle income families. Of these 117 study cases, 91 (77.8%) were married and 77 (65.8%) had parity up to 3. Mean body mass index (BMI) of our study cases was 26. 43 ± 3.11 kg/m^2 and obesity was present in 41 (35%) of our study cases. Mean disease duration was 10.22 ± 6.39 months and disease duration up to 12 months was present in 74 (63.2%). Mean ALT of our study cases was noted to be 42.97 ± 23.74 IU/L and non – alcoholic fatty liver disease was present in 57 (48.7%) of our study cases. **Conclusion;** Very high frequency of non – alcoholic fatty liver disease (NAFLD) was observed in patients having polycystic ovarian syndrome in our study. NAFLD was significantly associated with age, parity, obesity and prolonged disease duration. All the clinicians who are treating patients of Polycystic Ovarian syndrome must screen them for liver disease due to its high burden in these patients for early management which will decrease disease morbidity and will also improve their quality of life.

Keywords; Polycystic ovarian syndrome, non – alcoholic fatty liver disease, Frequency.

INTRODUCTION

Polycystic ovary syndrome (PCOS) is one of the most common endocrinological disorders, affecting 5–10% of the population of women in reproductive age[1]. Nowadays, PCOS is accepted to be not only a gynecological disorder, but also include cardiovascular risk factors and several metabolic problems[2]. Existing data indicate that about 50% of patients with PCOS have insulin resistance and fulfil the criteria for metabolic syndrome[3].

Although the pathophysiology of PCOS is not fully understood, insulin resistance (IR) seems to play a key role in the development of PCOS[3,4]. Nonalcoholic fatty liver disease (NAFLD) is now recognized as one of the most common causes of chronic liver disease in western countries. Pathologically, NAFLD comprises various degrees of progressive steatosis, lobular inflammation, and fibrosis of the liver[5]. NAFLD is strongly associated with insulin resistance, which is thought to have a key role in its pathogenesis and progression. Moreover, considering that a high proportion of patients exhibit the cluster of risk factors that defines metabolic syndrome, NAFLD is considered the hepatic manifestation of metabolic syndrome[6]. Considering the high prevalence of insulin resistance in PCOS, a 'hepatic manifestation' of PCOS might be speculated[7]. In fact, there is evidence from small cohorts showing that PCOS women are at an increased risk of developing NAFLD and conversely women with NAFLD are at an increased risk of having PCOS[8,9]. Another consideration is that insulin resistance is a common feature of both NAFLD and PCOS, it is very likely that both entities coexist in a given patient. This is an important issue which may have relevance for clinical management in terms of when and how to screen for liver disease in patients with PCOS. However, data on this issue are scarce[10,11]. In a study by Cedra C, et al, compared the frequency of NAFLD among patients with PCOS and controls. They found that Patients with PCOS showed a higher frequency of NAFLD (41% vs. 19%) than a control group. This suggests that patients with PCOS may have NAFLD, which is not addressed by treating gynaecologists or endocrinologists routinely. Since, there exist no recent guidelines regarding screening of NAFLD among patients with PCOS. So, this issue may remain unaddressed and may get complicated by liver cirrhosis and failure

MATERIALS AND METHODS

All patients of PCOs aged 20 – 45 years, duration of PCOs atleast 6 months were included in this study irrespective of their marital status and parity. Patients having history of alcohol use, hepatotoxic drugs like antituberculous, antifungal etc, hepatocellular malignancy and hepatitis A, B, or C virus infection were excluded from our study.

One hundred and seventeen cases fulfilling inclusion criteria were registered through outpatient Department of Gynaecology and Obstetrics, Nishtar Hospital Multan. Demographic history [including age (in years) was taken. Informed consent was taken through patients. Ultrasonography and serum ALT levels were sent for the detection of NAFLD in all the patients. The patients was labeled as yes for NAFLD if detected on USG and raised ALT levels more than 45 IU/L. All the collected data was entered into SPSS version 20 and analyzed.

RESULTS;

Our study comprised of a total of 117 study cases with polycystic ovarian syndrome who met inclusion criteria of our study. Mean age of our study cases was 31.35 ± 5.67 years (with minimum age of our study cases was 23 years while maximum age was 44 years). Our study results have indicated that majority of our study cases i.e. 62 (53%) were aged up to 30 years. Of these 117 study cases, 50 (42.7%) belonged to rural areas while 67 (57.3%) from urban areas, 61 (52.1%) were poor and 56 (47.9%) belonged to middle income families. Of these 117 study cases, 91 (77.8%) were married and 77 (65.8%) had parity up to 3. Mean height of our study cases was 157.44 ± 13.37 centimeters while mean weight of our study cases was 68.48 ± 12.91 kilograms. Mean body mass index (BMI) of our study cases was 26. 43 ± 3.11 kg/m^2 and obesity was present in 41 (35%) of our study cases. Mean disease duration was 10.22 ± 6.39 months and disease duration up to 12 months was present in 74 (63.2%). Mean ALT of our study cases was noted to be 42.97 ± 23.74 IU/L and non – alcoholic fatty liver disease was present in 57 (48.7%) of our study cases.

Table No. 1 Stratification of Non – alcoholic fatty liver disease (NAFLD) with regards to obesity.

Obesity	NAFLD		P – value
	Yes (n = 57)	No (n = 60)	
Yes (n = 41)	36	05	0.000
No (n = 76)	21	55	
Total	117		

Table No. 2

Stratification of Non – alcoholic fatty liver disease (NAFLD) with regards to disease duration.

(n = 117)

Disease duration	NAFLD		P – value
	Yes (n = 57)	No (n = 60)	
Up to 12 months (n = 74)	25	49	0.001
More than 12 months (n = 43)	32	11	
Total	117		

DISCUSSION;

Polycystic ovary syndrome (PCOS) is a common heterogeneous endocrine disorder characterized by irregular menses, hyperandrogenism, and polycystic ovaries[12, 13]. Although not required for diagnosis, the presence of insulin resistance and hyperinsulinemia is common and places those affected at increased risk of

diabetes and cardiovascular disease. Thus, PCOS adversely affects endocrine, metabolic, and cardiovascular health [14, 15].

Our study comprised of a total of 117 study cases with polycystic ovarian syndrome who met inclusion criteria of our study. Mean age of our study cases was 31.35 ± 5.67 years (with minimum age of our study cases was 23 years while maximum age was 44 years). Our study results have indicated that majority of our study cases i.e. 62 (53%) were aged up to 30 years. A study conducted by Wahab et al [16] from Peshawar also reported 27 ± 5.2 years mean age in women with PCOs which is close to our study results. Another study conducted by Butt et al [17] from Lahore also reported 30 ± 5.77 years mean age of the patients with PCOs which is close to our study results. Fauzia et al [18] from Hyderabad reported 57 % patients with PCOs belonged to the age group of 21 – 30 years which is in compliance with our study results. Wagan et al [19] from Nawabshah also reported 24.49 ± 4.87 years mean age which is in compliance with our study results. Another study from Abbottabad by Abbasi et al [20] also reported PCOs were predominately more present in women aged less than 35 years of age which is in compliance with our study results.

Of these 117 study cases, 50 (42.7%) belonged to rural areas while 67 (57.3%) from urban areas, 61 (52.1%) were poor and 56 (47.9%) belonged to middle income families. Of these 117 study cases, 91 (77.8%) were married and 77 (65.8%) had parity up to 3. Mean height of our study cases was 157.44 ± 13.37 centimeters while mean weight of our study cases was 68.48 ± 12.91 kilograms. Mean body mass index (BMI) of our study cases was 26. 43 ± 3.11 kg/m^2 and obesity was present in 41 (35%) of our study cases. A study conducted by Usmani et al [21] from Karachi also reported 25.6 ± 4.7 kg/m^2 BMI of the patients with PCOs which is close to our study results. Nisa et al [22] from Saudi Arabia also reported similar results.

Mean disease duration was 10.22 ± 6.39 months and disease duration up to 12 months was present in 74 (63.2%). Mean ALT of our study cases was noted to be 42.97 ± 23.74 IU/L and non – alcoholic fatty liver disease was present in 57 (48.7%) of our study cases. Zheng et al [23] from China reported 42 % NAFLD in patients with PCOs which is close to our study results. A study conducted in Greece by Vassilatou et al [24] also reported 64.5 % NAFLD in PCOs which is in compliance with our study results.

CONCLUSION;

Very high frequency of non – alcoholic fatty liver disease (NAFLD) was observed in patients having polycystic ovarian syndrome in our study. NAFLD was significantly associated with age, parity, obesity and prolonged disease duration. All the clinicians who are treating patients of Polycystic Ovarian syndrome must screen them for liver disease due to its high burden in these patients for early management which will decrease disease morbidity and will also improve their quality of life.

REFERENCES;

1. Lee H, Oh JY, Sung YA, Chung H, Cho WY. The prevalence and risk factors for glucose intolerance in young Korean women with polycystic ovary syndrome. Endocrine. 2009;36:326-32.

2. Kuscu NK, Var A. Oxidative stress but not endothelial dysfunction exists in non-obese, young group of patients with polycystic ovary syndrome. Acta Obstet Gynecol Scand 2009;88:612-7.

3. Wild RA, Carmina E, Diamanti-Kandarakis E, Dokras A, Escobar-Morreale HF, Futterweit W, et al. Assessment of cardiovascular risk and prevention of cardiovascular disease in women with the polycystic ovary syndrome: a consensus statement by the Androgen Excess and Polycystic Ovary Syndrome (AE-PCOS) Society. JCEM 2010;95: 2038–49.

4. Nisa M. Impact of obesity on frequency and pattern of disease in polycystic ovarian syndrome (PCOS). Ann King Edward Med Uni 2010;16:75-81.

5. Taseer IH, Hussain L, Safdar S, Mirbahar AM, Ahmad I. Frequency of non alcoholic fatty liver disease (NAFLD) and its biochemical derangements in type-2 diabetic patients. Pak J Med Sci 2009;25:817-20.

6. Brzozowska MM, Ostapowicz G, Weltman MD. An association between non-alcoholic fatty liver disease and polycystic ovarian syndrome. J Gastroenterol Hepatol 2009;24:243-7.

7. Baranova A, Tran TP, Birerdinc A , Younossi ZM. Systematic review: association of polycystic ovary syndrome with metabolic syndrome and non-alcoholic fatty liver disease. APT 2011;33:801–14.

8. Vassilatou E, Lafoyianni S, Vryonidou A, Ioannidis D, Kosma L, Katsoulis K, et al. Increased androgen bioavailability is associated with non-alcoholic fatty liver disease in women with polycystic ovary syndrome. Hum Repord 2010;25:212–20.

9. Gutierrez-Grobe Y, Ponciano-Rodríguez G, Ramos MH, Uribe M , Méndez-Sánchez N. Prevalence of non alcoholic fatty liver disease in premenopausal, posmenopausal and polycystic ovary syndrome women. The role of estrogens. Ann Hepatol 2010;9:402–9.

10. Cedra C, Perez –Ayuso RM, Riquelme A, Soza A, Villaseca P, Sir-Petermann T,et al. Nonalcoholic fatty liver disease in women with polycystic ovary syndrome. J Hepatol. 2007;47:412-7.

11. Azziz R, Sanchez LA, Knochenhauer ES, Moran C, Lazenby J, Stephens KC, et al. Androgen excess in women: experience with over 1000 consecutive patients. J Clin Endocrinol Metab. 2004;89:453-62.
12. Stein IF, Leventhal ML. Amenorrhea associated with bilateral polycystic ovaries. Am J Obstet Gynecol. 1935;29(2):181-91.
13. Azziz R, Carmina E, Dewailly D, Diamanti-Kandarakis E, Escobar-Morreale HF, Futterweit W, et al. The Androgen Excess and PCOS Society criteria for the polycystic ovary syndrome: the complete task force report. Fertil Steril. 2009;91:456-88.
14. Codner E, Villarroel C, Eyzaguirre FC, López P, Merino PM, Pérez-Bravo F, et al. Polycystic ovarian morphology in postmenarchal adolescents. Fertil Steril. 2011;95:702-6.
15. Sirmans SM[1], Pate KA[1]. Epidemiology, diagnosis, and management of polycystic ovary syndrome. Clin Epidemiol. 2013 Dec 18;6:1-13.
16. Wahab S, Farnaz, Karim R. Role of metformin in polycystic ovarian syndrome. J Postgrad Med Inst Apr - Jun 2013;27(2):179-83.
17. Butt F. Laparoscopic ovarian drilling by diathermy for ovulation induction in infertile women with polycystic ovarian syndrome. Ann King Edward Med Uni. 2011;17(2):150-6.
18. Adil F, Ansar H, Munir AA. Polycystic ovarian syndrome and Hyperinsulinemia. J Liaquat Uni Med Health Sci. 2005;4(3):89-93.
19. Wagan F, Suhail MA, Laghari A. Polycystic ovarian syndrome: response to metformin therapy. Pak J Med Sci. 2011;27(5):1038-41.
20. Abbasi AN, Sultana A, Izhar R, Begum S, Razaq S. Minilaparotomy and Ovarian Diathermy Drilling for Clomiphene resistant Polycystic Ovarian Disease. J Ayub Med Coll Abottabad. 2003;15(4):26-8.
21. Usmani A, Rehman R, Akhtar Z. Association of body mass index and dietary habits with ovarian and uterine morphology with subfertile polycystic ovarian syndrome. J Postgrad Med Inst. 2014;28(2):133-8.
22. Nisa M. Impact of obesity on frequency and pattern of disease in polycystic ovarian syndrome (PCOS). Ann King Edward Med Uni. 2010;16(2):75-81.
23. Zheng RH[1], Ding CF. Prevalence of nonalcoholic fatty liver disease in patients with polycystic ovary syndrome: a case-control study. Zhonghua Fu Chan Ke Za Zhi. 2008 Feb;43(2):98-101.
24. Vassilatou E[1], Vassiliadi DA[2], Salambasis K[2], Lazaridou H[2], Koutsomitopoulos N[2], Kelekis N[2], et al. Increased prevalence of polycystic ovary syndrome in premenopausal women with nonalcoholic fatty liver disease. Eur J Endocrinol. 2015 Dec;173(6):739-47.