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ORIGINAL ARTICLE

Association of Anti Mullerian Hormone with Biochemical markers in womens with and without Polycystic Ovarian disease

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ABSTRACT

Introduction: The frequency of polycystic ovarian syndrome (PCOS) has come to nearly epidemic extents in ladies of reproductive age around the world. Polycystic ovarian syndrome is one of the foremost common endocrinological problems in ladies. In expansion to chronic oligo-anovulation, the fundamental highlights of the PCOS incorporate raised levels of circulating androgens or clinical hyperandrogenism, polycystic ovary morphology, modified gonadotropin secretion, insulin resistance and compensatory hyperinsulinemia frequently related with obesity.

Objective: The purpose of this study was to compare the affiliations of anti-Müllerian hormone (AMH) with biochemical characteristics between ladies with and without polycystic ovary syndrome (PCOS).

Material & Method:

Study design: Quantitative cross sectional

Settings: Lady Wallington Hospital Lahore

Duration: Six months i.e. 1st July 2021 to 31st December 2021

Methodology: Quantitative cross sectional study was performed at lady Wallington hospital Lahore. The total numbers of patients were 150. Age of females was in between 18-35 years. The diagnosis of polycystic ovarian syndrome was made according to the Rotterdam ESHRE-ASRM criteria. The various parameters which include Body mass index, lipid profile, Blood sugar levels, FSH, LH, Prolactin, testosterone levels, AMH DHEA-S, HOMA-IR and adiponectin were measured. Collected data was entered in SPSS version 23 and analyzed.

Results: Data for females with PCOS and control summarized briefly in table no 1. AMH level have significant p value 0.001 and clearly showed that it is higher in females with PCOS whether fatty or non-fatty than normal or control.

Conclusion: In conclusion, AMH levels were essentially higher in ladies with PCOS, in any case of age and BMI, and exhibited no relationship with obesity, insulin resistance, or metabolic syndrome-related factors. Only testosterone shown an impact on serum AMH levels in PCOS group, whereas age, adiponectin as well as testosterone altogether related with AMH levels within the control group.

Keywords: Polycystic ovarian syndrome, AMH, Gonadotrophin, TSH, Insulin

INTRODUCTION

The frequency of polycystic ovarian syndrome (PCOS) has come to nearly epidemic extents in ladies of reproductive age around the world. Polycystic ovarian syndrome is one of the foremost common endocrinological problems in ladies. In expansion to chronic oligo-anovulation, the fundamental highlights of the PCOS incorporate raised levels of circulating androgens or clinical hyperandrogenism, polycystic ovary morphology, modified gonadotropin secretion, insulin resistance and compensatory hyperinsulinemia frequently related with obesity[1,2].

Anti Müllerian hormone (AMH), moreover known as Müllerian inhibiting substance (MIS), could be a dimeric glycoprotein hormone with an atomic weight of 140 kDa. AMH is well known for its part as a valuable marker of ovarian reserve, as it reflects the measure of the resting primordial follicle pool. In PCOS, AMH is thought to be a potential surrogate marker for the conclusion especially within the nonappearance of ultrasound[3,4]. Recently, analysts are centering on the relationship between AMH and metabolic components such as homeostasis show of assessment insulin resistance (HOMA IR), lipid profile, and adiponectin. Information on the relationship between AMH and the biochemical parameters may have significant clinical suggestions. The metabolic parameters speak to the components of metabolic syndrome (MetS), which commonly presents in females with PCOS. IR plays an important role in PCOS pathophysiology and it leads to compensatory increase in insulin level and hyperinsulinemia[5].

AMH level is additionally found to be increased in patients with PCOS. Insulin and AMH are accepted to have impact on steroidogenesis and folliculogenesis. Based on the fact that there is a possibility that AMH includes a relationship with IR and other MetS components counting lipid profile especially triglycerides (TG) and HDL C. AMH might too have a relationship with adiponectin, a novel biomarker for its relationship with IR and other MetS components. Studies with respect to the relationship between AMH and IR utilizing HOMA IR have been done, but the discoveries have been blended. A study by Stop et al. in ladies without PCOS found that there was a negative relationship between AMH and HOMA IR. In PCOS,

conflicting results have too been reported, and there were thinks about that illustrated positive, negative, and even nil affiliation between AMH and IR[6,7].

The purpose of this study was to compare the affiliations of anti-Müllerian hormone (AMH) with biochemical characteristics between ladies with and without polycystic ovary syndrome (PCOS)[7-9].

MATERIAL AND METHODS

The Quantitative cross sectional study was performed at lady Wallington hospital Lahore. The total numbers of patients were 150. Age of females was in between 18-35 years. The diagnosis of polycystic ovarian syndrome was made according to the Rotterdam ESHRE-ASRM criteria. The various parameters which include Body mass index, lipid profile, Blood sugar levels, FSH, LH, Prolactin, testosterone levels, AMH, DHEA-S, HOMA-IR and adiponectin were measured. Collected data was entered in SPSS version 23 and analyzed.

RESULTS

Data for females with PCOS and control summarized briefly in table no 1. AMH level have significant p value 0.001 and clearly showed that it is higher in females with PCOS whether fatty or non-fatty than normal or control. We also compared all parameters after labeling PCOS and control and noted significant findings in all variables. It has been observed that BMI, 2 hour glucose level, fasting insulin, total cholesterol, LDL, HOMA, DHEA have significant raised values in overweight fatty PCOS patients only as compared to control. On the other side it has been notices that LH, Free testosterone and AMH showed significant raised values in both overweight Fatty or non-fatty PCOS patients as compared to controls.

Table 1: Comparison of AMH with biochemical markers in females with PCOS and Control

No.	Parameter	Overweight/ Fatty PCOS (n=30)	Non- Fatty PCOS(n=80)	Overweight/ Fatty Control (n=10)	Non- Fatty/ Control (n=30)	P value
1	Age(years)	25+6	26.5+5	30+5	27.5+7.5	0.017
2	BMI	27.2+3.2	21.5+2.1	26+1	19.4+1.68	<0.001
3	Fasting blood glucose (mmol/L)	5.54+0.45	5.42+0.50	5.1+0.21	5.08+0.15	<0.001
4	2 hour glucose (mmol/L)	7.39+1.98	5.85+1.26	5.89+0.79	5.75+0.08	<0.001
5	Fasting insulin (pmol/L)	145.3+17.8	83.1+25.2	81.2+12.5	68.9+17.5	<0.001
6	2 h insulin (pmol/L)	1032+102.45	316.2+270.2	250.3+80.2	195.8+118.8	<0.001
7	Total Cholesterol (mmol/L)	5.52+1.45	4.42+0.50	5.1+0.70	5.10+0.80	<0.080
8	LDL (mmol/L)	3.25+1.25	2.70+0.48	2.90+0.70	2.40+0.60	<0.001
9	HDL (mmol/L)	1.42+0.45	1.70+0.40	1.60+0.10	1.85+0.35	<0.001
10	Fasting TG (mmol/L)	1.35+0.70	0.99+0.42	0.92+0.28	1.80+0.30	<0.001
11	HOMA-IR	6.10+5.95	2.75+1.52	2.58+0.40	2.35+0.40	<0.001
12	LH (IU/L)	9.22+6.95	9.35+5.52	6.35+4.40	4.35+2.40	<0.001
13	FSH (IU/L)	4.50+1.85	4.90+2.35	5.90+2.55	4.68+1.95	<0.389
14	Total testosterone (mmol/L)	1.96+0.001	1.78+0.001	0.98+0.001	1.06+0.000	<0.001
15	Free testosterone (mmol/L)	7.48+0.004	5.25+0.052	3.42+0.001	2.60+0.002	<0.001
16	DHEA-S (umol/L)	7.22+4.85	5.85+2.95	5.90+3.10	4.68+1.65	<0.003
17	Prolactin (ug/L)	9.80+4.85	9.75+4.90	9.40+2.80	14.50+6.85	<0.001
18	AMH (ng/L)	11.80+5.85	12.75+7.90	5.75+1.56	5.60+3.25	<0.001
19	Adiponectin (ug/mL)	5.10+2.85	8.40+3.90	3.90+2.00	9.14+4.40	<0.001

DISCUSSION

PCOS may be a complex reproductive and hormonal disorder associated with derangement in metabolic parameters which indicates a chance for long term clinical complications[10,11].

We analyzed AMH and different clinical/biochemical variables, which had already appeared conflicting results in relationship analysis with AMH. In our study, females with PCOS displayed appropriate biochemical characteristics of PCOS such as higher levels of insulin resistance parameters, lipid profiles, add up to testosterone, free testosterone, AMH, HOMA, DHEA have significant raised values in overweight fatty PCOS patients only as compared to control. In biochemical parameter examination, after classification of subjects concurring to weight, the overweight/ fatty PCOS group appeared altogether different results from those of the other three groups (non-fatty PCOS, overweight/fatty controls, non-fatty controls)[12]. However, serum AMH level was not higher within the overweight/ fatty PCOS group than within the non-fatty PCOS group. There have been a couple of studies that have previously reported serum AMH level reflected severity of PCOS. Considering these prior results, overweight/ fatty PCOS group could not be regarded as the more extreme PCOS group in spite of the fact that they were evaluated as particular from the other three groups and showed up to reflect a more noteworthy impact due to overweight fatty than observed in other groups[13,14].

A number of ponders have assessed the level of AMH in patients with PCOS. The esteem of AMH is known to be higher in patients with PCOS than without PCOS. There are confirmations that serum AMH level changed across different ethnicities. There might be both hereditary and environmental components that influence the serum AMH levels in different ethnic groups[15].

CONCLUSION

In conclusion, AMH levels were essentially higher in ladies with PCOS, in any case of age and BMI, and exhibited no relationship with obesity, insulin resistance, or metabolic syndrome-related factors. Only testosterone shown an impact on serum AMH levels in PCOS group, whereas age,

adiponectin as well as testosterone altogether related with AMH levels within the control group. This difference of associations might recommend a misfortune of multi-factorial control for AMH production in PCOS, and which might contribute to the pathogenesis of PCOS. Advance examination is needed to illustrate the role of AMH and the control mechanism of AMH production.

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