THE ASSOCIATION BETWEEN LUTEINIZING HORMONE / CHORIOGONADOTROPIN RECEPTOR (LHCGR) INS18LQ GENE POLYMORPHISM AND POLYCYSTIC OVARY SYNDROME (PCOS)

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INTRODUCTION

Polycystic ovary syndrome (PCOS) is one of the most common endocrine disorders of women in the childbearing period. however, its pathophysiology is still unclear. Variants of genetic markers have implications for the predisposition of PCOS, however, there are no variants that are directly and repeatedly linked to PCOS. Several single nucleotide polymorphisms (SNPs) can change the expression of genes or the function of the LHCGR protein, which has been identified in the LHCGR gene. The important functional role of LHCGR in the metabolism of androgen and ovulation, the LHCGR gene variant may be related to the risk of PCOS.

The aim of this study was to evaluate the association between LHCGR Ins18LQ gene polymorphism and PCOS.

MATERIALS AND METHODS

A case-control study was performed in 50 women with PCOS as the case group and 50 healthy women with none of the pathological characteristics as the control group from May 2019 until October 2019 in Halim Fertility Center. All participants were women of reproductive age.

Polymorphism of LHCGR ins18LQ genes was genotyped in all subjects using polymerase chain reaction-restriction fragment length polymorphism (PCR-RFLP). The allelic frequencies of each case group were compared with the controls.

RESULTS AND DISCUSSION

From this study, we found that there was no significant difference in the proportion of ages between the groups (p> 0.05). There were significant differences in the characteristics of Body Mass Index (BMI), FSH level, LH level, and LH / FSH ratio between the PCOS and control groups (p <0.05). We also found that the proportion of heterozygote variant non ins / ins was higher in the PCOS group compared to the control group but there was no significant difference between the polymorphisms of the non-ins and non ins-non ins variants between the PCOS and control groups (p=0.269). The frequency of ins alleles was higher in the PCOS group compared to the control group.

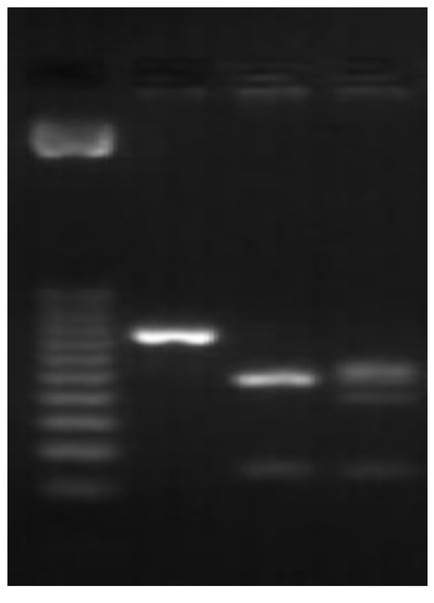

Figure 1. Results of Ins18LQ PCR products from left to right, column 1: marker 25 bp, column 2: uncut PCR product, column 3: homozygot wildtype nonins-nonins genotype (65,149 bp), column 4: heterozygot variant nonins-ins (27, 65, 128, 149 bp).

Table 1. Demographic characteristics of the patient population

Characteristics	PCOS n = 50	Control n = 50	p-value
Age (years), (Mean ± SD)	29.5 ± 3.6	31.2 ± 4.24	0.361[a]
BMI (kg/m²), (Mean ± SD)	26.4 ± 4.61	24.23 ± 2.93	0.019[b]
FSH, (Mean ± SD)	5.07 ± 1.19	5.94 ±1.89	0.008[c]
LH, (Mean ± SD)	10.97 ± 8.34	3.63 ±1.57	<0.001[c]
LH/FSH ratio, (Mean ± SD)	2.10 ± 1.16	0.65 ± 0.31	<0.001[c]

[a]Chi Square test was used
[b]Kruskal Wallis test was used
[c]T-independent test was used

Table 2. Association LHCGR Ins18LQ Gene Polymorphism in PCOS and Control

Polymorphism	PCOS (n=50)	Control (n=50)	p-value
LHCGR Ins18LQ			
- **Nonins/Nonins, n (%)**	44 (88)	48 (96)	
- **Nonins-ins, n (%)**	6 (12)	2 (4)	0.269[a]
- **Ins/Ins, n (%)**	0 (0)	0 (0)	
- **Nonins allele, n (%)**	94 (94)	98 (98)	
- **Ins allele, n (%)**	6 (6)	2 (2)	

[a]Fisher's Exact test was used

The results of this study are similar with Thathapudi et al. (2015) which reported that there was a significant difference between BMI in PCOS and controls (p <0.05) where BMI in PCOS was higher than in controls and they also find that LH level and LH/FSH ratio were higher in the PCOS group than control group (p<0.05) Elshal et al. (2015) and Liu et al. (2012) also did not find significant association between LHCGR ins18LQ polymorphisms and PCOS in Egyptian women and Chinese Han.

CONCLUSION

There was no significant association between LHCGR ins18LQ gene polymorphism and PCOS.

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