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Effect ABO Blood Groups and Hormones on Polycystic Ovarian Syndrome

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Abstract
Background Polycystic ovarian syndrome (PCOS) is an intricate and generally undiagnosed disease. The Maastricht criteria, which include polycystic ovaries, physical or biochemical evidence of hyperandrogenism, and oligo/anovulation, are among the commonly used diagnostic criteria for PCOS. After other potentially aggravating conditions are also checked out, only two of the three will result in a PCOS diagnosis and all related potential consequences, hormone imbalance that occurs during the reproductive years. If you have PCOS, you may not have regular periods. Or perhaps you have long cycles of menstruation. Method: A Karbala obstetrics facility admitted 0 females and 50 persons with polycystic ovarian conditions between February and May 2023. The Rotterdam 2003 criteria were used to diagnose polycystic ovary syndrome. The control group consists of 51 fertile women who underwent ultrasonography examination and had appropriate hormonal levels, resulting in regular menstruation and no excess testosterone symptoms. As a result, it was shown that people under the age of 36 had an increased incidence of this medical condition. The two sets were identical in age, ranging from 26 to 45. Each patient and control were given a survey questionnaire to complete. Our findings revealed that women with blood groups 'O' and 'B' were at the greatest danger of PCOS. Furthermore, our findings show that Rho-negative individuals have no relationship to PCOS Follicle-stimulating hormone (FSH) and luteinizing hormone (lh) levels were determined. The study found that FSH, LH, Prolactin, and TSH increased significantly. Furthermore, the number of CBC tests for WBC, HB, and PLT has significantly increased. Conclusion: While PCOS is more prevalent in B-positive females with blood groups O and B positive, significant differences in hormones (FSH, LH, and PROLACTIN) were found in PCOS patients as well as controls, suggesting a link between PCOS and these modifications.

Keywords*:* PCOS, LH, FSH, PLT, HB.

Introduction:

Karl Landsteiner initially described the human blood group system in 1900 to comprehend the unpredictable nature of hemolytic events caused by initial attempts at transfusions. 1 the International Society for the Study of Blood Transfusion (ISBT) recognizes 285 blood group antigens. 2 In humans, the ABO system is the most important blood group system, followed by the Rh system. Anthropologists frequently employ ABO blood types as a reference to the development of early diseases, particularly gastrointestinal problems, cancer, cardiovascular

disease, and infections.3-7Some blood types are linked to the transmission of other diseases, such as [1] McLeod syndrome is sometimes related with the Kell antigen.8 Certain blood types may influence susceptibility to infections; for example, persons missing Plasma antigens are less susceptible to vivax malaria infections [2].

The hormonal disorder polycystic ovarian syndrome (PCOS) affects at least 7% of infertile women. Polycystic ovarian syndrome (PCOS), which affects more than 10% of reproductive-age women, is one of the most common endocrine diseases. PCOS is a complex endocrine condition that affects multiple bodily systems and leads to reproductive and metabolic issues in women of reproductive years [3,4]. The pathogenesis of PCOS is poorly understood; evidence shows that multiple genes and environmental and dietary variables are implicated [5]. Menstrual irregularities and clinical or biochemical signs of hyperandrogenism, diminished fertility, polycystic ovaries, and biochemical profile abnormalities, including elevated LH, testosterone, and insulin levels while decreasing FSH levels, are among the distinguishing markers. PCOS is characterized by a high amount of androgen and the hyperandrogenism criterion. According to the National Institutes of Health (NIH) consensus standards, approximately 80% of polycystic ovarian women have elevated levels of androgen [6]. The signs and symptoms of PCOS, including hirsutism, acne, male pattern baldness, and oligo ovulation (absence of ovulation), are all caused by hyperandrogenemia. The ovaries, specifically theca cells, and the adrenal cortex's zona reticularis are the primary sources of excess androgen in PCOS [7].

Material & methods:

This was a hospital-based cross-sectional study that included patients from Al Hussaini Hospital who had been diagnosed with PCOS and were between the ages of [26-45]. The institutional ethics committee approved the study protocol. At orientation, each patient was given a complete description of the study's goals, methodology, and confidentiality before providing signed informed consent. Venipuncture was used to collect blood samples in a capillary tube. The evaluations relied solely on an antigen-antibody relationship. The glass marking pencil separates the porcelain tile into three sections for the agglutination test.

The individual whose blood group is to be identified is requested to stick out his finger, which is pierced, and 3-4 drops of blood are then taken under aseptic conditions. A drop of anti-A, anti-B, and anti-D sera is deposited on each of the three sections of the tile. Now, 1 drop of the diluted blood is placed on each of the three sera-containing parts; this is combined with three different toothpicks. After 10-15 minutes, we may check whether there is agglutination to determine the type of blood groups.

The case went on for an entire year. The study included patients with a PCOS diagnosis who were between the ages of (26-45). Except for diabetes mellitus, patients diagnosed with any chronic illness were disqualified from the study. Studying approach: A total of 91 PCOS patients between the ages of (26-45) who had been discovered in our facilities were included in the study. A PCOS questionnaire was presented to study participants, and data was gathered for each participant on a proforma. [8] The Pearson correlation coefficient was utilized to examine the relationship between the parameters being studied. P 0.05 was used to define statistical significance. All data were displayed using the means.

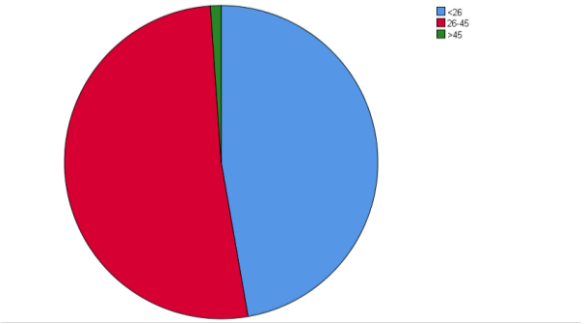
Result:

Table (1) The percentage of blood groups between the patients in this study.

Blood Group	Patient	Percentage
A+	5	12.15%
A-	3	7.3%
B+	10	24.39%
B-	0	0%
AB+	5	12.1%
AB-	0	0%
O+	18	43.9%
O-	0	0%
TOTALE	41	100

Of all the cases found, the age group was 51% between (26-45 years), the other 47% under 26 years, and just one case was more than 45 years old. And the mean of the age group is ± 1.54.

Table 2: distribution of the age group



Frequency	Percent	
<26	43	47.3
26-45	47	51.6
>45	1	1.1
Total	91	100.0

Figure (1): distribution age in the PCOS

The percentage of women who had PCOS was 45.1%, which means about half of the cases had the disease.

Table:3 the percentage the patient (PCOS)and control

Pcos			
		Frequency	Percent
Valid	Yes	41	45.1
	No	50	54.9
	Total	91	100.0

The result of an investigation done on the women is shown below. The association between the cases with PCOS and the age group showed no significance because (p-value = 0.640, means more than 0.050) and the per cent was about half, as shown in the table below.

Table 4: association between age group and PCOS

			Age group			Total
			<26	26-45	>45	
PCOS	Yes	Count	19	22	0	41
		% Within age group	44.2%	46.8%	0.0%	45.1%
	No	Count	24	25	1	50
		% Within age group	55.8%	53.2%	100.0%	54.9%
Total		Count	43	47	1	91
		% Within age group	100.0%	100.0%	100.0%	100.0%

The result of the evaluation of the investigation and the PCOS diseases is shown below.

Table 4: The result of the investigation evaluation and the PCOS

Report								
Pcos		FSH	LH	Testosteron	PRO	WBC	PLT	HB
Yes	Mean	3.7512	2.3415	.6732	8.2829	94.927	11.893	7.1610
	N	41	41	41	41	41	41	41
	Std. Deviation	1.57037	1.30230	.62531	3.64080	7.3430	1.1359	1.91701
No	Mean	4.3808	12.2250	1.3080	20.4472	14.506	477.402	15.1260
	N	50	50	50	50	50	50	50
	Std. Deviation	2.05719	3.31865	.41058	4.70804	1.9711	111.2028	1.18149
Total	Mean	4.0971	7.7720	1.0220	14.9666	50.740	267.667	11.5374
	N	91	91	91	91	91	91	91
	Std. Deviation	1.87065	5.58577	.60534	7.41599	40.5577	246.9293	4.27470

It is unclear what exactly is causing this hormone imbalance.2 The most prominent trait in women with PCOS is an excessive production of androgen. While women with PCOS may have elevated testosterone levels in their blood due to the adrenal.

Discussion

Growing evidence shows that blood group components are essential in a disease's etiology or defence mechanism. A study found a significant positive association with blood group B and a significant negative association with blood group O in cases of myocardial infarction, a significant positive association with all blood groups except for blood group O in cases of valvula-pathic (rheumatic) illnesses, a significant positive association with blood type A and a significant negative association with blood type B in cases of arterial hypertension in males only, and no connection between blood group ABO and congenital cardiac conditions.1Congenital adrenal hyperplasia, hypothyroidism, and others are differential diagnoses for PCOS. Other pituitary/adrenal illnesses hyper hyperprolactinemia, androgen-secreting neoplasms, and Cushing's syndrome [9]. Due to their significance in blood transfusion & associations with various disorders, both the ABO & Rhe systems are the most widely utilized blood group systems in humans.

According to the current study, blood group O-positive women are most at risk of getting PCOS, followed by blood group B-positive women. Women who have a blood type of O are more inclined to develop PCOS. According to the results of the current study, women who are blood type O positive are most at risk of getting PCOS, followed by those who are blood group B positive. Women who have the blood type O are more likely to develop PCOS. Pelvic ultrasound is still the primary diagnostic technique for PCOS, despite routine diagnostic evaluations, including history taking, signs and symptoms, and several laboratory tests [10]. Previous research on blood types and breast cancer revealed no association between the Rh factor and the disease. [11,12] Similar to this, our findings suggest that Rh-negative people did not exhibit any correlation with PCOS. Research has revealed that dietary choices can affect disease etiology [13].

The present results are consistent with earlier research, which indicates that a diet that includes both food and alcohol consumption is a risk factor for the condition.

Conclusion

Early detection of PCOS, improved management, and the avoidance of problems could all be achieved with an early screening of O-positive and B-positive females of reproductive age in

South India, particularly those who are on a mixed diet and consume alcohol. It is believed that the cause of this condition is an aberrant relaxation of the pelvic veins. Due to the pituitary's improved sensitivity to GnRH and increased activity, the LH/FSH ratio increased [14].
The pulse's GnRH frequency demonstrates that healthy adult women prefer producing LH with high-frequency pulses over FSH with low-frequency pulses. Increased progesterone production by the corpus luteum lowers LH pulse frequency, which is desired as it aids in follicular expansion for the subsequent menstrual cycle since progesterone controls pulse frequency with the setting of estradiol [14]. Instead of increased GnRH production, LH hypersecretion in PCOS is likely brought on by changed GnRH secretion rhythms or enhanced pituitary responsiveness to GnRH. It is likely the result of PCOS patients' less receptivity to the inhibiting impact of supplemental progesterone on LH secretion and the absence of the corpus luteum [15].
The LH secretion rhythm may alter for various reasons, including obesity, metabolic problems, or changed sex steroid production. The significant growth of the overall and progressive pain numerical census drives the rise in interleukin persistence. Phagocytic cells encourage hair filtration at the back of the skull [16]. Persistent thrombocytosis may exacerbate the innately procoagulant state in PCOS caused by stimulation of the coagulation cascade, platelet activation, and endothelial dysfunction. We offer a method beyond traditional cardiac risk variables to quantify cardiovascular risk in PCOS patients. Haemoglobin levels may be affected by the PCOS testing requirements of oligo- or amenorrheic menstrual periods and excess androgen. L According to the findings, compared to women without PCOS, women with PCOS have significantly greater haemoglobin levels and a decreased prevalence of anaemia. [16]

The LH/FSH ratio rises because of increased GnRH responsiveness and pituitary activity [17]. According to the GnRH pulse rate, LH is preferentially produced in healthy adult women through higher-frequency pulses as opposed to FSH through a low-frequency pulse. In the presence of estradiol, progesterone modulates the pulse frequency, resulting in increased corpus luteum progesterone production lowers the LH pulse frequency to stimulate FSH production, which aids in the development of follicles and the ensuing cycle of menstruation [17]. LH hypersecretion in PCOS is more likely caused by altered GnRH secretion patterns or higher pituitary sensitivity to GnRH than by increased GnRH production. Since the condition lacks a corpus luteum that produces progesterone cyclically, it appears to result from an acquired impairment in the hypothalamic pulse generator's sensitivity to the negative feedback of estrogen and progesterone, possibly because of prolonged exposure to estrogen. In addition, both the hypothalamus and pituitary are less susceptible to the regulatory effect of exogenous progesterone on LH production in PCOS [18].

Obesity, metabolic dysfunction, and altered sex steroid production could all contribute to the modified LH secretion pattern.

Conclusion

A significant amount of the hormones LH, FSH levels, and PROLACTIN have been identified in both PCOS patients and controls, suggesting a possible relationship between PCOs. Age affects polycystic ovarian syndrome more than the patient does (26-45). Women who are overweight are more likely to develop polycystic ovarian syndrome, according to the questionnaire.

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