**ABSTRACT**

Polycystic Ovarian Syndrome is a genetically induced disease associated with hormonal imbalance. It is a condition that affects one in 10 women of reproductive age. It has become one of the complicated diseases due to poor diagnosis which in turn results in delaying clarification of its genetics, aetiology, clinical associations and assessment of treatment. In this review article the link between genetics and PCOS will be discussed.

**INTRODUCTION**

In a recent study relating to the link between the genetical factor and PCOS a survey was done in which around 1500 women from all over the world suffering from PCOS were chosen. The genes of these pcos affected women were compared with the genes of normal women. The major difference which they found was the genes for reproductive hormones from the pituitary gland, and the receptors of those hormones in the ovaries. Later they came to a conclusion that pituitary gland was not the only genetic factor involved but a part of other genetic risk variants.

Researchers have also discovered that constant ailment in either a mother or father can make unfavourable conditions in the womb that are connected with the advancement of polycystic ovarian disorder (PCOS) in their daughters. In another study, scientists found that siblings of ladies with PCOS and insulin resistance are themselves at more risk of creating insulin resistance or diabetes, proposing that elements connected with the condition can be passed down to children and in addition to their daughters.

**GENETICAL INTERACTIONS**

Environmental factors mainly along with genes interact to provoke the phenotype biochemical parameters, including insulin levels or hyperandrogenemia, seem to be highly inheritable, suggesting that some clinical signs, symptoms, or biochemical parameters of PCOS could be transmitted.

Genetic investigations of PCOS can be divided into chromosomal/human leukocyte antigen (HLA) research, Karyotypes had been the primary genetic gear used inside while examining of PCOS. There have been remoted case reviews or small collection reporting polyploidies and aneuploidies specifically X chromosomal aneuploidies. Those consist of XX/XXX and XX/XO mosaics. Large cytogenetic series of PCOS sufferers, however, have found regular karyotypes.

A relation between PCOS with the X chromosome aneuploidies and polyploidies in addition to other cytogenetic abnormalities has been confirmed. The concept behind this research is that at least in few cases PCOS is caused due to X chromosomal factors which causes an abnormal follicular apparatus i.e. (ovarian cyst are derived from follicular apparatus before or after ovulation) and also a large deletion of the long arm of chromosome 11 was seen in some cases of PCOS.

Different studies have determined a genetic susceptibility to PCOS. It was shown that polycystic ovaries and hyperandrogenemia are present in 50% of sisters of affected women. Both linkage and association studies have advised that PCOS may be defined by the interaction of a small range of key genes with...
environmental, especially dietary factors [26–38]. Hyperandrogenaemia is genetically determined and the end result of familial studies indicates hyperandrogenism clusters as a dominant genetic trait. The steroid synthesis gene CYP11a, coding for P450 cholesterol side chain cleavage and the insulin gene regulatory region may be involved [15,22,38,45].

Some of the research studies were done by undergoing the ultrasonol tests. Hague and colleagues used high-resolution ultrasonography in order to identify polycystic ovaries in women who had complains of menstrual disturbances, hyperandrogenic phenomena, drastic weight gain, and infertility. The ultrasonic appearance of the ovaries was considered to be a more sensitive diagnostic marker than either symptoms or biochemical markers. Segregation ratios were in excess of those expected in an autosomal dominant mendelian inheritance [45–49].

The major found criteria for the linkage between pcos and genetics was seen in women with diabetic background. The mother with diabetic history showed that the risk of pcos was found to be more in their daughters.

CONCLUSION

The significance of genetic and environmental elements within the etiology of PCOS is unclear. Modern-day awareness has focussed on importance of the genetics elements, due to the fact that molecular genetic techniques can now be employed to evaluate the contributions of person genes in complex genetic problems. Both autosomal and X-related dominant modes of inheritance were advocated to explain the found familial clustering of instances of PCOS. Lack of a sensitive diagnostic marker has formerly made it hard to follow segregation of the syndrome in families. Ovarian ultrasound enables definition of the phenotype more accurately than can be realizing by consideration of symptoms or biochemical parameters of the syndrome alone, and can thus be used to more accurately assign affected status.

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