

## Understanding the Heterogeneity of Polycystic Ovarian Syndrome: The Influence of Ethnicity and Body Mass

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**Abstract :** Background: Polycystic ovarian syndrome (PCOS) is one of the most common endocrine disorders affecting women of reproductive age. The aetiology behind PCOS is poorly understood but influencing ethnic, environmental, and genetic factors have been recognised. However, literature examining the impact of ethnicity is scarce. We hypothesised Body Mass Index (BMI) and ethnicity influence the clinical, metabolic, and biochemical presentations of PCOS, with an interaction between these factors. Methods: A database of 1081 women with PCOS and a control group of 72 women were analysed. BMIs were grouped using the World Health Organisation classification into normal weight, overweight and obese groups. Ethnicities were classified into European, South Asian, and Afro-Caribbean groups. Biochemical and clinical presentations were compared amongst these groups, and statistical analyses were performed to assess significance. Results: This study revealed ethnicity significantly influences biochemical and clinical presentations of PCOS. A greater proportion of South Asian women are impacted by menstrual cycle disturbances and hirsutism than European and Afro-Caribbean women. South Asian and Afro-Caribbean women show greater measures of insulin resistance and weight gain when compared to their European peers. Women with increased BMI are shown to have an increased prevalence of PCOS phenotypes alongside increased levels of insulin resistance and testosterone. Furthermore, significantly different relationships between the waist-hip ratio and measures of insulin and glucose control for Afro-Caribbean women were identified compared to other ethnic groups. Conclusions: The findings of this study show ethnicity significantly influence the phenotypic and biochemical presentations of PCOS, with an interaction between body habitus and ethnicity found. Furthermore, we provide further data on the influences of BMI on the manifestations of PCOS. Therefore, we highlight the need to consider these factors when reviewing diagnostic criteria and delivering clinical care for these groups.

**Keywords :** PCOS, ethnicity, BMI, clinical

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