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Impact of PCOS Morphology on Long-Term Risk of Type 2 Diabetes

Women with “string-of-pearls” (SOP) pattern of follicular distribution in polycystic ovary syndrome (PCOS) are at a higher risk of type 2 diabetes compared to women with other patterns of follicular distribution, according to a study presented at the Scientific Congress & Expo of the American Society for Reproductive Medicine (ASRM), held in Denver from October 19 to 23, 2024¹.

This study aimed to investigate the correlation between polycystic ovarian morphology with long-term morbidity and mortality rates in patients with PCOS. Women who enrolled between 1987 and 2005 for long-term health monitoring at a university center were recruited for the study, with follow-up extending to the year 2024. Patients with the “SOP” follicular distribution pattern, defined as presence of 12 or more follicles in the periphery of at least one ovary measuring 2 to 9 mm, were compared with women without this pattern categorized as nonperipheral clustering (NPC). Demographics, serum hormone levels, and cardiovascular risk factors were collected at enrollment for all the participants. The primary outcomes were all-cause mortality and chronic morbidity across a range of health conditions, which included metabolic, cardiovascular, neurological, respiratory, autoimmune, and mental health disorders, as well as specific cancers. Both groups were followed for over three decades.

Out of the initial 1,089 women with PCOS enrolled, 340 had sonographic information available. Of these, 189

had the SOP follicular distribution and 151 had a more random multifollicular distribution.

At the start of the study, patients with SOP follicular distribution were younger with median age of 28.0 years (vs. 32.6 years); they had higher body mass index (BMI) (mean 27.2 vs. 25.3 kg/m²), and also had higher serum luteinizing hormone, follicle-stimulating hormone, androgens, fasting insulin, total cholesterol, and triglycerides compared to the group with NPC follicular distribution. Seven deaths (3.7%) occurred among patients with the SOP ovarian morphology versus 9 deaths (6.0%) in the NPC group. The SOP group had a significantly younger age of death than the NPC group; 54.3 years versus 70.8 years, respectively.

The prevalence of noninsulin-dependent diabetes mellitus (NIDDM) was significantly higher in patients with the SOP ovarian appearance (23.8%) versus only 9.2% in those with NPC pattern. Women in the SOP group also had a numerically higher rate of hypertension; 34.3% for SOP group versus 25.1% for NPC group; however, this difference failed to reach statistical significance. The prevalence of other medical conditions evaluated did not differ significantly between the two groups.

After adjusting for confounding variables, only NIDDM was found to be associated with the SOP follicular distribution pattern; this group had an almost threefold increased risk of developing NIDDM with adjusted odds ratio of 2.92. However, no other disease state showed

significant between-group difference in the prevalence after controlling for confounders.

This long-term, single-center study confirms that ovarian morphology in PCOS patients is associated with elevated androgen levels and increased metabolic disturbances. However, apart from NIDDM and premature mortality in the SOP group, ovarian morphology had little impact on the development of other chronic diseases later in life in women with PCOS.

“Longer follow-up will further delineate how disease states are altered in these groups”, conclude the authors.

REFERENCE

1. Kugelman N, Morris DV, Dahan MH, Saint-Luc C. O-256. A 37-year prospective study of patients with polycystic ovary syndrome: comparing chronic morbidity and mortality in patients with and without sonographic string of pearls polycystic ovary appearance. *Fertil Steril.* 2024;122(4):e106.

