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**ANTI-MULLERIAN HORMONE: A MODERN REVIEW AND ITS DIAGNOSTIC
UTILITY IN POLYCYSTIC OVARIAN SYNDROME**

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Polycystic Ovarian Syndrome (PCOS) is a complex endocrine disorder characterized by hyperandrogenism, ovulatory dysfunction, and polycystic ovarian morphology. Anti-Müllerian hormone (AMH) has emerged as a potential biomarker for PCOS due to its association with ovarian follicle development and granulosa cell function. This thesis aims to provide a detailed review of the current literature on AMH and its utility in the diagnosis and management of PCOS.

A systematic search of electronic databases including PubMed, Google Scholar, and relevant medical journals was conducted. Studies investigating the relationship between AMH and PCOS, published between 2014 and 2024, were included. Methodologies for AMH measurement, including enzyme-linked immunosorbent assay (ELISA) and automated immunoassay platforms, were reviewed. The diagnostic performance of AMH compared to other hormonal markers such as testosterone and luteinizing hormone (LH) was assessed. International evidence-based Guideline for the Assessment and Management of Polycystic Ovary Syndrome 2023 was used as an up-to-date therapeutic guide.

An AMH was first identified in the 1930s as a substance produced by the testes that caused regression of the Mullerian ducts during male fetal development. AMH produced by the granulosa cells of growing follicles appears to inhibit the growth of primordial follicles; in its absence there is a faster depletion of growing follicles, although it is unknown whether this is a direct or indirect effect of AMH. Clinically, serum AMH may be a useful biomarker of ovarian reserve. In humans and mice, serum AMH declines with increasing age. Although it is difficult to establish a direct link between serum AMH and the primordial follicle pool in humans, antral follicle number is positively correlated with AMH levels.

Over the following decades, researchers began to explore the potential clinical applications of AMH, particularly in the diagnosis and monitoring of reproductive disorders. The development of sensitive AMH assays in the 1990s allowed for more accurate quantification of AMH levels, leading to a surge in research on its role in reproductive health.

AMH levels are consistently elevated in women with PCOS, reflecting the increased number of small antral follicles characteristic of the syndrome. Several studies have demonstrated the superior diagnostic accuracy of AMH compared to traditional markers, particularly in adolescents and lean women with PCOS. AMH levels correlate positively with ovarian volume and the number of antral follicles, providing valuable insights into ovarian reserve and follicular development. Furthermore, AMH has been proposed as a predictor of response to ovarian stimulation in assisted reproductive technologies.

AMH holds promise as a diagnostic and prognostic biomarker in PCOS. Its ability to reflect ovarian reserve and follicular development makes it a valuable tool for assessing the reproductive potential of women with PCOS. Incorporating AMH measurement into clinical practice may improve the accuracy of PCOS diagnosis and facilitate personalized management strategies. However, further research is needed to standardize AMH assays and establish optimal reference ranges for different populations.