

Markedly Elevated Anti-Mullerian Hormone in a Woman with Polyendocrine Metabolic Ovarian Syndrome: A Case Report

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ABSTRACT

Anti-Mullerian hormone (AMH) is secreted by the granulosa cells of antral and preantral follicles. It is an indicator of a woman's ovarian reserve. Women with polyendocrine metabolic ovarian syndrome (PMOS), traditionally described as polycystic ovary syndrome (PCOS) have serum AMH towards higher side in comparison to non PCOS women.^{1,2} We report a case of young lady in her late twenties presented to paropakar maternity and women's hospital, Nepal, for primary infertility, irregular menstruation, and weight gain. Both her ovaries had polycystic morphology on transvaginal sonography and her serum AMH level was 45 ng/ml. This high level of AMH provoked suspicion of a granulosa-cell tumor. Thus, infertility was initiated only after exclusion of tumor with initial evaluation of serum tumor markers. So, even in cases of PMOS if AMH is extremely high initial evaluation of coexisting granulosa cell tumor of the ovary may be needed.

Keywords: Anti-Mullerian hormone (AMH); Polyendocrine Metabolic Ovarian Syndrome (PMOS), Granulosa-cell tumor; Infertility

Spike in AMH, thinking beyond PCOS; A Case Report

INTRODUCTION

Poly Endocrine Metabolic Ovarian Syndrome (PMOS) that was traditionally recognized as polycystic ovary syndrome (PCOS) is characterized by interconnected reproductive, endocrine, ovarian, and metabolic features is easily diagnosed with Rotterdam criteria.¹ Which was revised in 2023 with recommendation of using serum AMH is alternative to ultrasound for defining polycystic ovarian morphology in adults.²

Anti-Mullerian hormone (AMH) is secreted by the granulosa cells of antral and preantral follicles. It is an indicator of a woman's ovarian reserve. Women with PMOS have notably increased preantral and small antral follicles leading to higher AMH levels.^{1,2} We report a case of 28-years-old woman with primary infertility of 5 years' duration who presented to infertility OPD of paropakar maternity and women's hospital (PMWH), Kathmandu Nepal. She had irregular menstrual cycles and progressive weight gain with BMI of 29 kg/m². She was a known case of hypothyroidism receiving thyroxine 50 mcg daily. She was not evaluated previously for her infertility. She was not having acne and acanthosis nigricans. Her thyroid examination was normal. There were no overt signs of virilization. Abdominal and pelvic examinations revealed no palpable mass.

Both her ovaries were predominantly noted with polycystic morphology on transvaginal sonography with antral follicle counts of 69 (Right ovary – 37, left ovary 32). Her serum AMH was recorded to be 45 ng/mL (reference interval was 2.1–4.0 ng/mL) in CLIA-based laboratory despite of absence of clinically detectable ovarian mass, and no any definite ovarian neoplasm in trans vaginal sonography. She was a typical case of PCOS rotterdam's diagnostic criteria, with presence of menstrual irregularity and polycystic ovarian morphology.^{1,2} As AMH was beyond ten times the normal range, we also evaluated her with serum tumor markers (Inhibin B, Ca125, CEA, CA19-9, BHCG, AFP and LDH) that were normal and not indicative of any tumor of ovarian origin. As granulosa-cells may be harboring tumor in them to produce very high level AMH.³ She was euthyroid (TSH of mIU/dL) with her serum prolactin level (6 ng/ml) within normal limit. For he PMOS, she received counselling

regarding lifestyle modification, dietary measures, physical activity, and weight management. Her fertility treatment was initiated with ovulation induction as recommended by WHO.

At follow-up, she reported adherence to dietary and lifestyle measures and improvement in menstrual regularity. Continued ovarian imaging and clinical reassessment were planned. Unless any significant changes are noticed in follow up scans, repeat AMH will be performed after six months if not conceived with ovulation induction cycles.

DISCUSSION

The central feature of this case was PCOS/PMOS, with an exceptionally high AMH concentration. Though, initial investigation were not in favor of granulosa cell tumor in our case recent Robeva et al. have reported a similar case of Bulgarian PCOS women having high AMH but with co-existence granulosa-cell tumors illustrating the diagnostic overlap between these conditions.⁴ A meta-analysis done by sibang chen et al., have highlighted the value AMH in screening ovarian granulosa-cell tumors.³ In our case, the absence of a definite ovarian mass and normal tumor-marker(inhibin B) helped us to move on to further management of her infertility with ovulation induction.^{5,6}

CONCLUSION

When the AMH concentration is unusually high, even in PMOS cases, suspicion for granulosa cell tumor exists. Thus, further studies are needed to explain PCOS/PMOS with extreme values of AMH and providing individualized treatment for every woman.

Declarations

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Ethical approval: NA

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