

AN AMH-BASED SCREENING TOOL IS BOTH SENSITIVE AND SPECIFIC FOR PREDICTING A DIAGNOSIS OF PCOS BY ROTTERDAM CRITERIA



University of California
San Francisco



BRIGHAM AND
WOMEN'S HOSPITAL

Miriam Andrusier, MD, MPH¹; Eduardo Hariton, MD, MBA²; Andrea Pelletier¹; Jacob P. Christ, MD³; Jerrine R. Morris, MD, MPH⁴; Eleni G. Jaswa, MD, MSc³; Molly M. Quinn, MD³; Marcelle I. Cedars, MD³; Heather G. Huddleston, MD³

¹Department of Obstetrics, Gynecology and Reproductive Biology, Brigham & Women's Hospital, Boston, MA, USA

²Reproductive Science Center of the San Francisco Bay Area, San Ramon, CA, USA

³Center for Reproductive Health, University of California San Francisco, San Francisco, CA, USA

⁴Shady Grove Fertility, Baltimore, MD, USA



Background

- In the U.S., the Rotterdam criteria are commonly used for PCOS diagnosis, requiring 2 out of 3 criteria, one being polycystic ovarian morphology (PCOM) on ultrasound.
- AMH levels are strongly correlated with follicle number per ovary (FNPO) and have been proposed as a surrogate marker for PCOM.

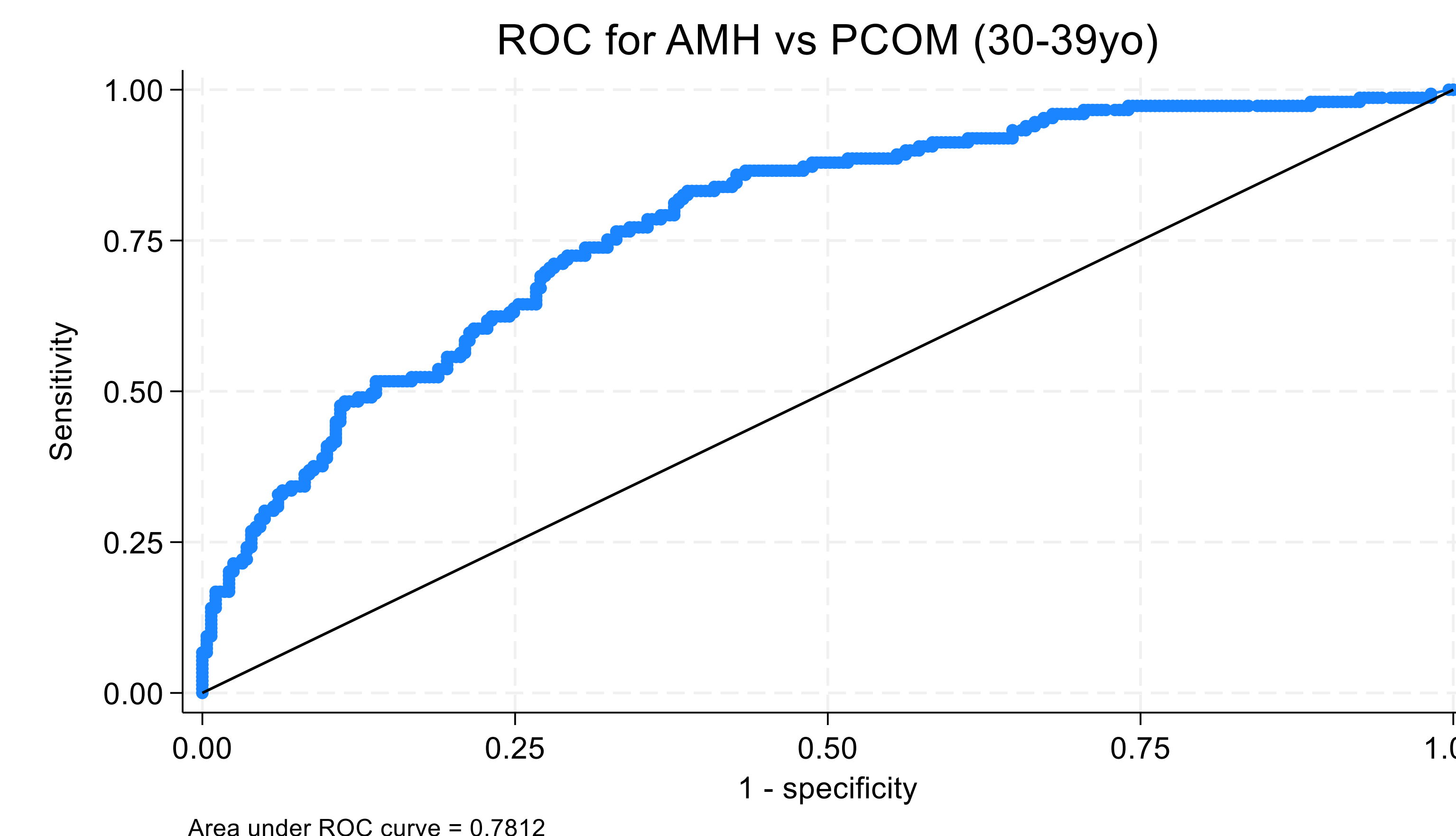
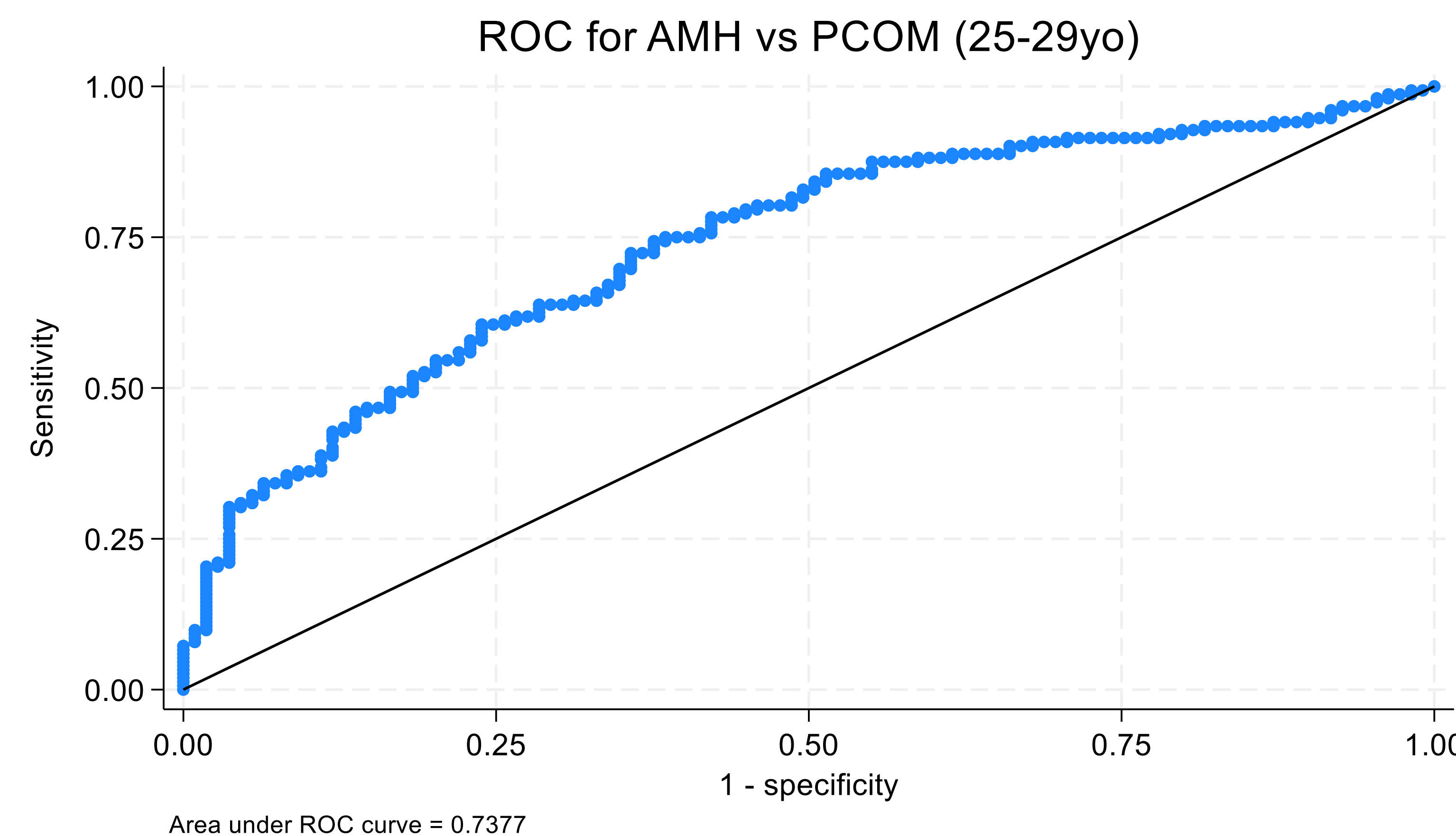
Objective

- To evaluate whether a PCOS screening tool using anti-Müllerian hormone (AMH) levels in lieu of polycystic ovarian morphology (PCOM) can reliably identify patients who meet the Rotterdam criteria for PCOS.

Methods

- Subjects included 516 PCOS patients diagnosed by ultrasound-based Rotterdam criteria and the control group included 617 patients without PCOS.
- Receiver operating curves (ROC) were used to calculate age-stratified AMH thresholds to predict PCOM, defined as FNPO >20 with groups aged 25-29, 30-34, and 34-39.
- These age-stratified AMH thresholds were used as one of the three criteria for the diagnosis of PCOS, in addition to oligomenorrhea (<8 menstrual cycles per year) and biochemical hyperandrogenism (free androgen index >6 ng/dL).

- AMH thresholds were initially calculated from a randomly selected age-matched training group which comprised roughly one-quarter of the total cohort (n=388). The thresholds were then validated against the remainder of the cohort (n=745), termed the experimental group, to create a modified Rotterdam criteria using the original Rotterdam criteria as the gold standard.



Results

- The subjects in the validation group exhibited **significant demographic differences**, with non-PCOS patients being older and having lower BMI, waist/hip ratios, and AMH levels compared to those with PCOS.
- The age-stratified **AMH threshold** to predict PCOM was **6.75 ng/dL for patients aged 25-29** and **6.25 ng/dL for patients aged 30-39**.
- Using these thresholds, the modified Rotterdam criteria accurately identified PCOS (per original Rotterdam criteria) in 219/298 patients and correctly predicted the absence of PCOS in 409/447 patients in the validation group, yielding an overall **sensitivity of 73.5%** and **specificity of 91.5%**.

Conclusion

- The modified Rotterdam criteria incorporating age-stratified AMH thresholds demonstrate high sensitivity and specificity for predicting a diagnosis of PCOS as defined by the traditional Rotterdam criteria.
- The use of AMH offers a non-invasive and objective alternative to transvaginal ultrasound for screening patients for PCOS.
- Further research is warranted to evaluate the performance of this screening tool prospectively in more heterogeneous populations, with varied AMH assays, and among patients with differing ovulatory statuses.