ACCESS AMH LITERATURE
2015–2017

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"The performance of the assays across numerous laboratories, and over a protracted time frame, has been examined through the UK NEQAS published results. The automated assays show high-quality performance figures over a broad concentration range, with exceptionally low variance figures, and they also yield very similar absolute concentration values."

Fleming R, et al. Human Fertility 2017 Jun. 8:1–5. doi: 10.1080/14647273.2017.1331298.

Performance characteristics of the Access AMH assay for the quantitative determination of anti-Müllerian hormone (AMH) levels on the Access family of automated immunoassay systems

Demirdjian G, Bord S, et al.

Clinical Biochemistry 2016;49:1267–1273.

Objectives: Anti-Müllerian hormone (AMH) measurement is useful as an aid in the evaluation of ovarian reserve. In the past, its conventional use was restricted by the low throughput and variability of existing manual AMH assays. We developed the automated Access AMH assay for the quantitative determination of AMH levels on the Access family of immunoassay systems. The analytical performance of this new assay was evaluated.

Design and methods: Sensitivity, dilution linearity, assay imprecision, AMH sample stability, lot-to-lot comparison and correlation with AMH Gen II assay (Beckman Coulter, Inc.) were evaluated. Reference intervals for Access AMH were established in healthy females, males, newborns (≤60 days) and pediatric males classified by Tanner stages.

Results: The limit of blank and limit of detection were below 0.0077 and 0.0098 ng/mL, respectively. The limit of quantitation was 0.010 ng/mL. The total imprecision ranged from 2.4 to 5.2%. Linearity was observed up to 24 ng/mL. Sample storage at room temperature up to 48 h, at 2–8°C up to 7 days and at −20°C up to 15 months, had no impact on measured AMH. The correlation study gave a coefficient between 0.99 and 1, and a regression slope between 0.89 and 0.92. Excellent lot-to-lot comparability was observed on controls and patient samples with a maximum bias of 3.7% between 2.81 and 15.03 ng/mL.

Conclusions: The fully automated Access AMH immunoassay demonstrates excellent analytical performance. As a consequence, the availability of this assay will represent a robust, fast and precise alternative to manual AMH assay testing.

A-040: A prospective multisite evaluation of the intra-menstrual cycle variability of anti-Müllerian hormone (AMH) using an automated AMH immunoassay

Shin SS, Jones KL, et al.

Clinical Chemistry 2015;61(S10):S13.

Objective: Published results for intra-menstrual cycle variability lack agreement. The purpose of this study is to determine whether or not AMH levels vary significantly across the normal menstrual cycle.

Methods: 24 apparently healthy women were prospectively enrolled from 2 sites with IRB-approved informed consent. Blood samples were collected 2 times per week throughout each complete menstrual cycle (21 to 35 days) starting with baseline (day 2 to 4). Eligibility criteria: ≥18 years to ≤45 years, both ovaries present, no polycystic ovary syndrome (PCOS), no history of ovarian surgery, no exposure to cytotoxic drugs or pelvic radiation therapy, no recent contraceptive use, and no other recent hormonal therapy. Serum samples were tested on the Beckman Coulter Access 2 immunoassay analyzer. Age-adjusted mixed-effects models were constructed to estimate intraclass correlation (ICC) and within-subject variability across the menstrual cycle.

Results: 191 specimens were collected from 24 women (mean age 35 years; range 24 to 45 years). Older age was significantly associated with lower mean AMH values (p-value=0.004). There was no evidence of a linear trend in AMH levels across cycle days (p-value=0.409). AMH showed more variability when AMH levels ≥3 ng/mL and less variability when AMH levels <3 ng/mL. The estimated ICC was 0.94 (95% confidence interval, 0.89–0.96), indicating that 6% of the overall variability in AMH was due to within-subject variability.

Conclusion: No trend in AMH results was observed throughout a normal menstrual cycle. Fluctuations in AMH results during the menstrual cycle accounted for only 6% of the overall variability.

T096: ACCESS® AMH immunoassay: performance of a new highly sensitive automated assay

Nicouleau L, Demirdjian G, et al.
Clin Chem Lab Med 2015;53S:s695.

Background-Aim: Anti-Müllerian hormone (AMH) measurement is useful as an aid in the evaluation of the ovarian reserve and in prediction of the outcome of assisted reproductive technology. A number of manual AMH enzyme-linked immunosorbent assays (ELISA) are available to determine the AMH level in serum or plasma. However, with the development of automated assays that provide increased sensitivity and lower imprecision compared to ELISA, the use of AMH in routine clinical practice can be expanded. The aim of our study was to evaluate the performance of a new, fully automated AMH assay on the Access family of immunoassay systems.

Methods: Access AMH is a simultaneous one-step immunoenzymatic assay that uses two AMH-specific monoclonal antibodies in a sandwich format using serum or lithium heparin plasma. The Access AMH assay detects 140 kDa total AMH (cleaved and uncleaved) and does not bind to the other related members of transforming growth factor-β superfamily. Calibrators are prepared with recombinant human AMH. Twenty microliters of sample volume is needed and the quantitative result is available after approximately 40 minutes. Within run and total imprecision were calculated based on 4 serum samples. Method comparison was performed with the Beckman Coulter AMH Gen II assay in 104 patient sera, and with the Ansh Labs and Immunotech AMH ELISA assays in 47 patient sera.

Results: The Access AMH assay was standardized against the Beckman Coulter AMH Gen II assay, covering a measuring range from 0.02 to 24 ng/mL. The calibration curve and open vial calibrator stability are 31 and 90 days, respectively. Within-run and total imprecision ranged from 1.5 to 1.7% and 3.0 to 3.1%, respectively. In this study, the limit of detection (LoD) was 0.0049 ng/mL and limit of quantitation (LoQ) was 0.010 ng/mL. Access AMH, when compared to the AMH Gen II, Ansh Labs, and Immunotech AMH ELISA kits, yielded a correlation coefficient of 0.99, 0.99, and 1.00, and a slope of 0.91, 0.79 and 0.87, respectively.

Conclusion: The fully automated Access AMH immunoassay demonstrates excellent analytical performance. As a consequence, the availability of the fully automated Access AMH assay will represent a fast and precise alternative to manual AMH assay testing.

Objective multicenter performance of the automated assays for AMH and estimation of established critical concentrations

Fleming R, Fairbairn C, Gaudoin M.

Human Fertility. 2017 Jun. 8:1-5. doi: 10.1080/14647273.2017.1331298.
[Epub ahead of print]

The measurement of AMH has now become widespread practice within the field of fertility treatment and research, despite technical issues with some of the original assays. The two new automated assays, with their potentially improved technical performance, require detailed examination and comparison under different conditions. In addition, the determination of categories of responses to ovarian stimulation, require re-evaluation for these new tests. The performance of the assays across numerous laboratories, and over a protracted timeframe, has been examined through the UK NEQAS published results. The automated assays show high-quality performance figures over a broad concentration range, with exceptionally low variance figures, and they also yield very similar absolute concentration values. Critical response diagnostic concentrations have been re-evaluated by determination of age-related concentrations from within large population data sets.

Table. No difference between either the median concentration evaluations for the Elecsys and Access 2 assays, nor for the variance analysis between laboratories using the different automated assays from results from the objective multicenter UK NEQAS evaluation.

Assay	Median AMH (pmol/L)	Interlaboratory variance (%) (mean)	Var low (mean)	Var high (mean)
Access 2	20.2	5.3	5.6	5.3
Elecsys	20.4	5.2	5.3	4.9

Performance of the two new fully automated anti-Müllerian hormone immunoassays compared with the clinical standard assay

Helden, JV, Weiskirchen R.
Human Reproduction 2015;30(8):1918–1926.

Study question: How do the two new fully automated anti-Müllerian hormone (AMH) assays released in September 2014 by two different diagnostic companies perform compared with the clinical standard assay, namely the AMH Gen II enzyme-linked immunosorbent assay (ELISA)?

Summary answer: Both fully automated AMH assays perform in a nearly identical fashion compared with the AMH Gen II assay, with a higher analytical sensitivity.

What is known already: Owing to the lack of standardization, the results of AMH ELISA assays are sometimes difficult to compare. The Beckman Coulter AMH Gen II assay became the clinical reference assay over the last few years. Two newly developed fully automated, highly sensitive AMH immunoassays, based on the AMH Gen II antibody composition, have become available since September 2014.

Study design, size, duration: Previously characterized serum samples from 155 women were used to measure AMH with the 3 immunoassays, focusing on the aspect of predicting ovarian reserve.

Participants/materials, setting, methods: Samples from 94 women with an unfilled desire for a child, diagnosed as infertile/subfertile; 29 samples women with polycystic ovary syndrome; and, 32 women approaching menopause were included in the study. The precision and the linearity in dilutions of the two new AMH assays were determined and the assay results were compared with the clinical reference (the modified version of the Beckman Coulter AMH Gen II assay) and to the antral follicle counts of the study participants. Cutoff values for the discrimination between each of two predefined groups were calculated using receiver operating characteristic analysis.

Main results and the role of chance: The performance evaluation of the fully automated AMH assays resulted in a within-run and intermediate precision of 0.9–1.9% and 2.5–6.5%, with the one, and 0.9–3.6% or 4.4–10.7% with the other immunoassay, respectively. Pearson's coefficient of correlation was 0.991 for the method comparison between both assays with a bias of 0.003 ng/ml and a slope of 0.97. The discrimination of the new immunoassays between subfertile women and women approaching menopause was significantly better compared with the Beckman Coulter Gen II assay (87.5 versus 68.8%, p, 0.05).

Assessment of the Access AMH assay as an automated, high-performance replacement for the AMH Generation II manual ELISA

Pearson K, Long M, et al.

Reproductive Biology and Endocrinology 2016;14:8.

Background: The manual Generation II (Gen II) ELISA method used to measure anti-Müllerian Hormone (AMH) from Beckman Coulter has recently been superseded by a fully automated AMH immunoassay. The aim of this study was to evaluate the performance of the Access AMH assay and directly compare it to the modified Gen II ELISA method. A secondary aim was to verify that the fertile age-related AMH range previously established using the Gen II ELISA could be used to interpret results from the new automated Access assay.

Methods: The precision, stability, linearity, measurement range and detection limits were determined using recombinant AMH and patient serum samples. Different diluents and their effects on AMH concentration were compared. A correlation study was performed on patient samples to compare the Access AMH assay to the ELISA method on the Access 2 and DxI 800 analyzers. The fertile AMH range was verified by comparing the 10th, 50th and 90th percentile values from both methods obtained from 489 natural conception pregnant women.

Results: The Access AMH assay showed good performance across the measuring range for both intra-assay (CV 1.41–3.30%) and inter-assay (CV 3.04–5.76%) precision and acceptable sample stability. Dilution of the high-concentration samples with the recommended diluent resulted in a small but significant downward shift in values. The assay was linear over the range of values recommended by the manufacturer, allowing for accurate reporting within the reported range. The two assay types were highly correlated (R2=0.9822 and 0.9832 for Access 2 and DxI 800, respectively), and the differences observed between the Access 2 and DxI 800 analyzers were within clinically acceptable ranges, indicating that the methods are interchangeable. Furthermore, we demonstrated that results from the published reference range for the Gen II ELISA correlate with those from the automated Access AMH assay.

Conclusion: Here, the published performance of the Access AMH assay was verified and showed excellent correlation with the Gen II ELISA method. Moreover, we validated this correlation was validated by confirming that the results from a fertile AMH reference range established using the preceding Gen II ELISA are interchangeable with the new automated Access AMH assay.

Two new automated, compared with two enzyme-linked immunosorbent, anti-Müllerian hormone assays

Nelson SM, Pastuszek E, et al.

Fertil Steril 2015;104(4):1016-1021.e6.

Objective: To compare new automated anti-Müllerian hormone (AMH) assay performance characteristics from the new automated Elecsys AMH (Roche; Elecsys) and Access AMH (Beckman Coulter; Access) assays with the existing AMH Gen II ELISA (enzyme-linked immunosorbent assay; Gen II; Beckman Coulter) and AMH ELISA (Ansh Labs) assays.

Patients: Patients referred for serum AMH measurement (n=83) before start of in vitro fertilization cycle between September 2014 and October 2014.

Results: Intra-assay coefficients of variation were low: Ansh ≤9.0%; Gen II ≤5.8%; Access ≤10.7%; and Elecsys ≤2.8%. The Passing-Bablok regression equations (pmol/L) were y (Access)=0.128 + (0.781 × Gen II); and y (Access)=0.302+(0.742 x Ansh). For y (Elecsys) =0.087+(0.729 x Gen II) and y (Elecsys)=0.253+(0.688 x Ansh Labs).
For y (Elecsys)=0.943-(0.037 × Access). For all the assays, AMH exhibited a moderate positive correlation with AFC (r=0.62–0.64); number of cumulus oocyte complexes (r=0.60–0.64); and metaphase II oocytes (r=0.48–0.50). Accuracy of pregnancy prediction, as determined by area under the receiver operating characteristic curve, was uniformly low for all assays (0.62–0.63).

Conclusions: The novel automated assays exhibit strong concordance in calibration, but derived values are substantially lower than those obtained from pre-existing assays, with assay-specific interpretation required for routine clinical use. These results highlight the need for an international standard of measurement of AMH.

Please see the following site for additional comments and insights into this publication
http://fertstertforum.com/nelsons-automated-manual-amh-assays/

Re: Two new automated, compared with two enzyme-linked immunosorbent, anti-Müllerian hormone assays
By Nigel Groome B.Sc. M.Sc., (Birm), M.Sc. Ph.D., (Lond), Emeritus Professor

P-364 Validation of the Access AMH assay & its comparison with LabCorp Ultrasensitive assay

Younis A, Hawkins KC, Butler WJ
Fertility and Sterility 2016;106 (3):e24.

Objective: AMH is the best currently available measure of ovarian reserve. In the USA, most fertility clinics get AMH values from LabCorp or a specialty laboratory, such as Ansh Labs. We are the first outpatient fertility laboratory to validate and implement the Beckman Coulter Access AMH assay in USA. The objective of this study was to evaluate the performance of the Access AMH assay using patient serum samples and directly compare results with LabCorp AMH levels.

Design: Prospective AMH assay evaluation in a fertility outpatient laboratory.

Material and Methods: Coefficients of variation, precision, stability, linearity and inter-laboratory comparison were determined using recombinant AMH quality control and patient serum samples. Patients were consented and made aware that the AMH assay will based on materials designed by the manufacturer as research use only (RUO). Blood were collected for AMH on the day of the first office visit for fertility workup. Serum AMH levels of 30 women (age 20–44 yrs) were assayed locally using the Access 2 analyzer and at LabCorp using the ultrasensitive AMH assay. An inter-laboratory correlation study was performed on 75 patient samples in which AMH values were first obtained using a UniCel DxI analyzer at an independent outside laboratory (Pathology Associates Medical Laboratories, Spokane, WA). The serum samples were frozen and shipped in dry ice to the location, where they were thawed and analyzed in the Access 2 analyzer using similar reagent kit lots. All statistical evaluation was performed using SPSS.

Results: The Access AMH assay demonstrated excellent performance across the measuring range for both intra-assay and inter-assay coefficients of variation (2.1% and 1.8%, respectively). The assay was linear over the six ranges recommended by the manufacturer, and no strong bias was observed. AMH values ranged from 0.015 to 20.01 ng/ml with the LabCorp and 0.011 to 25.40 ng/ml with Access AMH. Values between fresh and frozen samples using the Access AMH assay revealed no impact of sample freezing/storage. The Access AMH and LabCorp ultrasensitive assay types were highly correlated (R2=0.97, Slope 0.96), and no statistical differences were observed between the two methods. Inter-laboratory comparison results showed that the two systems were statistically identical (R2=0.998 and 0.997 for Access 2 and UniCel DxI, respectively).

Conclusions: We have been validated and now routinely measured in-house using the Access automated assay. Regression analysis demonstrates high correlation across the measuring range between the results obtained on two different analyzers located in different geographical locations. The findings of the correlation studies demonstrate strong agreement between the results generated by the Access AMH and LabCorp ultrasensitive assay, indicating that the two methods are interchangeable.

T-069: Measurement of anti-Müllerian hormone by a new automated chemiluminescent immunoassay

Baraldi E, Roli L, et al.

Clin Chem Lab Med 2015;53S:s668.

Aim: Considering the wide use of AMH measurement in daily clinical practice and the large number of conditions for which it may be used, it is essential for the clinician to have accurate and reproducible results. Currently, the most widely used method is enzyme-linked immunoassay (ELISA), but this method has intrinsic limitations of sensitivity and of throughput. Recently, a new automated chemiluminescent immunoassay method is available. As laboratory tests performed on automated platforms are more accurate and less time costing, we compared results of our traditional method ELISA with the new automated one.

Methods: A total of 107 archived serum samples from women with subfertility or reproductive endocrine disorders (aged from 22 to 52) were assayed using the AMH Gen II ELISA manual assay (Beckman Coulter) and Access AMH assay, a paramagnetic particle chemiluminescent immunoassay (Beckman Coulter) using the DxI 600 instrument. The samples covered a wide range of AMH concentrations (0.0–22 ng/ml).

Results: Total imprecision of the AMH Gen II ELISA and the Access AMH assays was ≤12.0 and ≤10.0%, respectively, over a range of concentrations from 0.16 to 22 ng/ml. The detection limit of the assays was 0.08 ng/ml and 0.02 ng/ml. For the AMH Gen II and the Access AMH assays, the median (interquartile range) was 1.51 (0.08–20.0) ng/ml and 1.03 (0.02–25.4) ng/ml, respectively ($p<0.0001$). The Passing-Bablok regression equation (in ng/ml) was: y (AMH Access)=-0.0195+0.7312 x (AMH Gen II ELISA) and the regression coefficient R=0.988.

Conclusion: AMH concentrations using the Access AMH assay are slightly lower than those from the AMH Gen II ELISA kit, but well correlated. The worldwide standardization of the assay is required and this study can facilitate a comparison between the old results and those which will be obtained in the future, using any of the two assays considered. Meanwhile, adapting clinical cutoffs from previously published works by direct conversion is not still recommended, but it is important a critical clinical evaluation together with other diagnostic and ecographic parameters.

T072: Anti-Müllerian hormone—immunoassay method comparison

Alves J, Manaças M, et al.

Clin Chem Lab Med 2015;53S:s671.

Background-Aim: Anti-Müllerian hormone (AMH) is a dimeric glycoprotein produced in the gonad exclusively. It is used as a marker for assessing the ovarian reserve and as an initial predictor of ovarian response to gonadotropin stimulation. The National Institute for Health and Care Excellence (NICE-UK) recommends a three-class approach when aiming at in vitro fertilization (IVF) ovarian gonadotropin stimulation response prediction (low <0.8 ng/mL; moderate 0.8–3.6 ng/mL; high >3.6 ng/mL). The objective of this study was to evaluate the performance of two different AMH immunoassays (CLIA and ECLIA), and compare them with the long standing standardized ELISA method.

Methods: 78 patients were enrolled (convenience sample). Serum AMH levels were simultaneously assayed using three distinct analytical methods: ELISA (AMH Gen II ELISA, Beckman Coulter; Werfen Best 2000), CLIA (Access AMH Paramagnetic-Particle CLIA Beckman Coulter; Beckman Coulter Access 2) and ECLIA (Elecsys AMH Roche; Roche Cobas e411). SPSS 20V software was used for statistical analysis.

Results: After removal of three outliers >15 ng/mL, the correlation coefficient showed a very strong positive correlation between ELISA/CLIA assays ($R=0.977$)($p<0.001$) (Pearson's test)($y=0.93x$), and between ELISA/ECLIA assays ($R=0.980$)($p<0.001$) (Pearson's test)($y=0.81x–0.01$). The Bland-Altman dispersion plot pointed that, despite the very strong correlation, the values obtained when using the ELISA assay were almost always higher than values obtained by CLIA or ECLIA. This difference was more obvious with the ELISA/ECLIA comparison. The Fleiss' test showed a strong class (three classes) agreement between ELISA/CLIA ($\kappa=0.846$)($p<0.001$) and ELISA/ECLIA ($\kappa=0.750$) ($p<0.001$) which was stronger between ELISA/CLIA.

Conclusion: A strong correlation has been shown between the ELISA/CLIA and ELISA/ECLIA assays. When compared with the standardized ELISA assay, the CLIA assay had a better class agreement, when using the above described prognostic groups. Clinical studies should address the prognostic importance of class allocation and class inclusion cutoff values regarding AMH, since small interassay differences, in highly correlated assays, can mean different class allocation and different prognosis.

Age-independent anti-Müllerian hormone (AMH) standard deviation scores to estimate ovarian function

Helden JV, Weiskirchen R.

European Journal of Obstetrics & Gynecology and Reproductive Biology 2017;213:64–70.

Objectives: To determine single-year age-specific anti-Müllerian hormone (AMH) standard deviation scores (SDS) for women associated to normal ovarian function and different ovarian disorders resulting in sub- or infertility.

Design and methods: Determination of particular year median and mean AMH values with standard deviations (SD), calculation of age-independent cutoff SDS for the discrimination between normal ovarian function and ovarian disorders.

Results: Single-year-specific median, mean and SD values have been evaluated for the Beckman Coulter Access AMH immunoassay. While the decrease of both median and mean AMH values is strongly correlated with increasing age, calculated SDS values have been shown to be age independent with the differentiation between normal ovarian function measured as occurred ovulation with sufficient luteal activity compared with hyperandrogenemic cycle disorders or anovulation associated with high AMH values and reduced ovarian activity or insufficiency associated with low AMH, respectively.

Conclusion: These results will be helpful for the treatment of patients and the ventilation of the different reproductive options.

Relationship between anti-Müllerian hormone and antral follicle count across the menstrual cycle using the Beckman Coulter Access assay in comparison with Gen II manual assay

Schiffner J, Roos J, et al.

Clin Chem Lab Med 2017;55(7):1025–1033

Background: The study aim was to validate Beckman Coulter's fully automated Access immunoassay system (Beckman Coulter Access assay) for anti-Müllerian hormone (AMH) and compare it with Beckman Coulter's Modified Manual Generation II assay (Beckman Coulter Mod Gen II), with regard to cycle AMH fluctuations and antral follicle counts.

Methods: During one complete menstrual cycle, transvaginal ultrasound was performed on regularly menstruating women (n = 39; 18–40 years) every two days until the dominant ovarian follicle reached 16 mm, then daily until observed ovulation; blood samples were collected throughout the cycle. Number and size of antral follicles were determined and AMH levels measured using both assays.

Results: AMH levels measured by the Beckman Coulter Access assay vary over ovulatory menstrual cycles, with a statistically significant pre-ovulatory decrease from -5 to +2 days around objective ovulation. Mean luteal AMH levels were significantly lower (-7.99%) than mean follicular levels but increased again towards the end of the luteal phase. Antral follicle count can be estimated from AMH (ng/mL, Beckman Coulter Access assay) concentrations on any follicular phase day. Beckman Coulter Access assay-obtained AMH values are considerably lower compared with the Beckman Coulter Mod Gen II assay (-19% on average); conversion equation: Beckman Coulter Access AMH (ng/mL)=0.85 [Beckman Coulter Mod Gen II AMH (ng/mL)]0.95.

Conclusions: AMH levels vary throughout the cycle, independently of assay utilized. A formula can be used to convert Beckman Coulter Access assay-obtained AMH levels to Beckman Coulter Mod Gen II values. The number of antral follicles can be consistently estimated from pre-ovulatory AMH levels using either assay.

New automated anti-Müllerian hormone assays are more reliable than the manual assay in patients with reduced antral follicle count

Tadros T, Tarasconi B, et al.
Fertil Steril 2016;106:1800–1806.

Objective: To compare the strength of the relationship between antral follicle count (AFC) and serum anti-Müllerian hormone (AMH) concentrations obtained with two automated and one manual AMH assays in three different AFC populations.

Patient(s): Frozen–thawed serum samples of 211 assisted conception candidates, aged 24–43 years.

Intervention(s): Serum AMH was measured using one manual (AMH Gen II) and two fully automated (Access AMH and Elecsys AMH) assays. Antral follicle count was performed under strictly standardized conditions and sorted into three groups according to tercile values: low AFC (3–12 follicles; n=73), intermediate AFC (13–20 follicles; n=65), and high AFC (21–84 follicles; n=73).

Main Outcome Measure(s): Strength of correlation between AMH levels and AFC.

Result(s): Overall, AMH levels were lower with Access AMH (-16%) and Elecsys AMH (-20%) than with AMH Gen II. Remarkably, the strength of correlations between AFC and circulating AMH levels was the same with the three assays (r=0.83). Yet in the low AFC group, serum AMH levels obtained by Access AMH and Elecsys AMH showed a stronger correlation with AFC (r=0.63 and r=0.65, respectively) than the AMH Gen II (r=0.52), a phenomenon that was not observed in the remaining AFC groups.

Conclusion(s): As compared with conventional AMH Gen II assay results, [1] serum AMH concentrations were -16% and -20% lower with Access AMH and Elecsys AMH, respectively; and [2] automated assays were more strongly correlated to AFC in the subset of patients with reduced follicle count.

Effect of long-term use of hormonal contraception on anti-Müllerian hormone secretion

Kucera R, Ulcova-Gallova Z, et al.

Gynecological Endocrinology 2015;11:1–3.

Abstract: Anti-Müllerian hormone (AMH) is an important factor associated with female fertility and the ovarian reserve. There are several past studies available concerning the influence of hormonal contraception (HC) on serum AMH levels. Recent studies have reported that AMH levels in women using HC can be about 30% lower compared to those not using HC. However, earlier studies showed no reduction in AMH levels in HC users. We decided to evaluate the effects of long-term HC use (mean duration of HC use: 11.4 years) on AMH levels in women. To exclude potential shorter and reversible decreasing effects of HC on fertility function, we decided to include women in the study who had stopped using HC one year before the AMH sample collection. We examined 105 women who used HC and 44 women who had never used HC. The median concentration of AMH in the group of long-term users of HC was 2.89 and 3.37 ng/ml in the group of women who had never used HC. We found no statistically significant difference (p=0.3261). In conclusion, we observed no negative impact of HC on the AMH serum levels. AMH can be used as an ovarian reserve marker for these women.

AMH serum levels were assayed using the chemiluminescent kit Access AMH (Beckman Coulter, Brea, CA). Measurements were performed using the UniCel DxI 800 (Beckman Coulter).

Technical and performance characteristics of anti-Müllerian hormone and antral follicle count as biomarkers of ovarian response

Iliodromiti S, Anderson R, et al.
Human Reproduction Update 2015;21(6):698–710.

Background: Stratified (individualized) medicine has been recognized as a key priority for policy makers and healthcare providers. The main principle of individualized care depends on utilizing patients' characteristics and biomarkers to predict prognosis, tailor intended treatment and predict treatment outcomes. In reproductive medicine a wide variety of biomarkers have been proposed as predictors of ovarian response; of these, anti-Müllerian hormone (AMH) and antral follicle count (AFC) are purported as exhibiting the most favorable analytical and performance characteristics. Previously AFC and AMH have been considered essentially interchangeable; however, recent trial data have questioned this postulation. The aim of this review is to present an analysis of the strengths and weaknesses of these biomarkers as predictors of ovarian response, using both physiological and technical perspectives.

Methods: We have conducted a systematic search of the most recent (to May 2014) relevant literature was conducted and summarized the existing evidence. Articles written in a language other than English without an available English translation were excluded.

Results: Both AMH values and AFC can be influenced by comparable technical, physiological and exogenous factors. AMH displays some variation within and between cycles, consistent with its physiological role in follicle development, and there are growing data on the impact of pharmacological treatments and pathological conditions but cycle-independent measurement is appropriate for clinical purposes. A range of issues with manual AMH assays may be resolving with the development of fully automated assays. Despite described standardization of its measurement technique, AFC is subject to marked inter- and intra-operator variability and the effects of external influences are likely to be comparable. Out with some highly specialist centers, the intracyclic variation in AFC requires its measurement between day two and four of the cycle. Observational studies suggest comparable performance characteristics for AMH and AFC in predicting poor and high ovarian response, but recent RCTs suggest markedly better performance for AMH.

Conclusions: The performance characteristics of both AMH and AFC for the prediction of ovarian response to exogenous gonadotrophins have been inflated by single site observational cohorts, resulting in the viewpoint that AMH and AFC exhibit equivalent performance.

Evaluation of the multisite anti-Müllerian hormone (AMH) age-related reference intervals on women with proven natural fertility using the Beckman Coulter Access immunoassay systems

Wyness SP, Denham DS, et al.

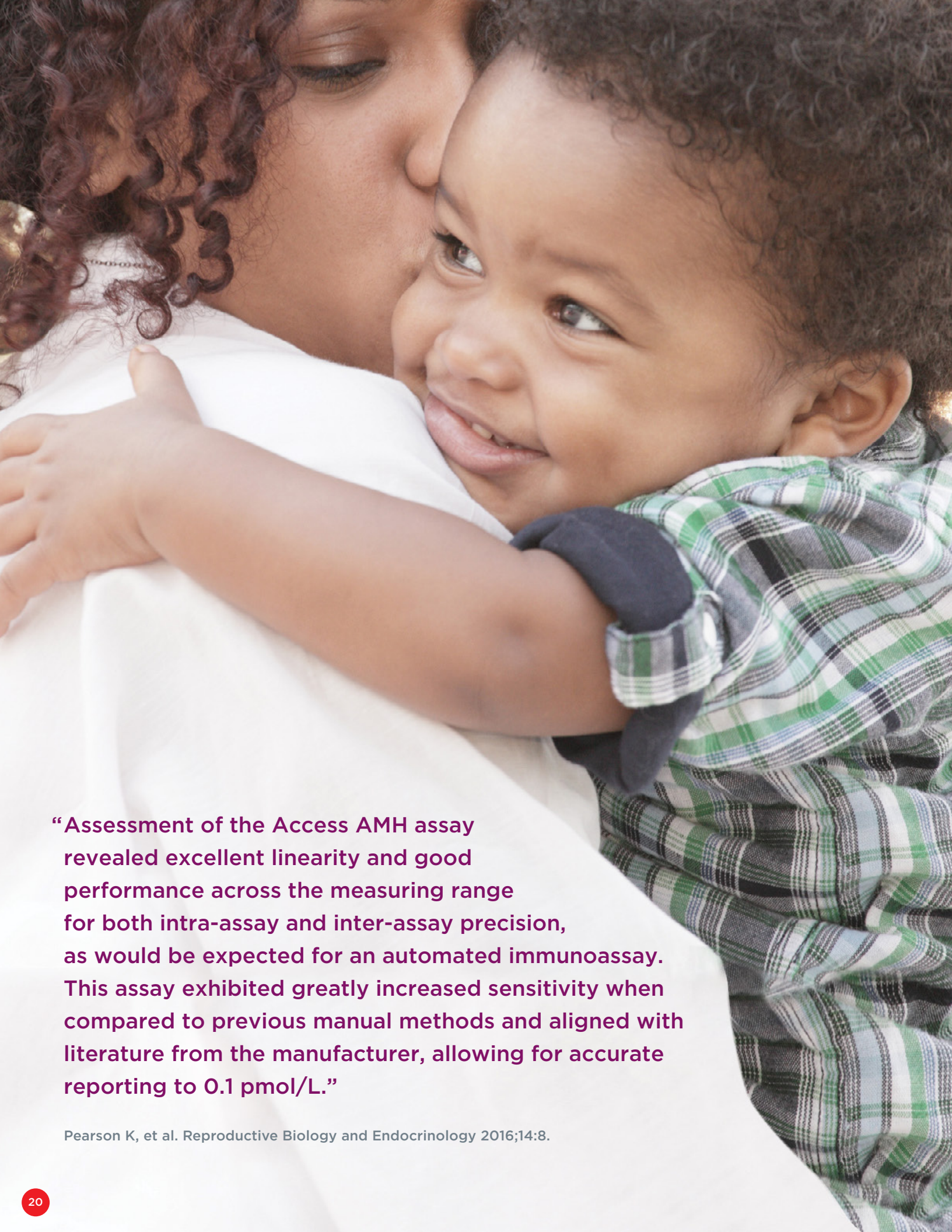
AACC poster 2016;S76.

Background: Anti-Müllerian hormone (AMH) is a naturally occurring hormone found in both males and females. Published literature suggests AMH has potential for evaluating the ovarian reserve in women of reproductive age and is known to vary by age. Beckman Coulter has developed an automated version of the AMH Gen II assay used on the Beckman Coulter Access 2 immunoassay analyzer. Age-specific reference intervals were evaluated.

Methods: 622 women with proven natural fertility were prospectively enrolled from three U.S. centers. All racial backgrounds were eligible. Subjects were ≥18 years of age, had regular menses (21–35 days) and both ovaries. Women with PCOS, previous ovarian surgery, exposure to cytotoxic drugs or pelvic radiation therapy, or recent contraceptive use were excluded. Serum samples were analyzed using the Beckman Coulter Access 2 immunoassay analyzer. Data were initially stratified to age ranges: 18–25, 26–30, 31–35, 36–40, 41–45 and ≥46 years. Outliers were removed using Tukey's method on Box-Cox transformed data. The robust method was used to estimate the 2.5th and 97.5th percentiles and their 90% confidence intervals.

Results: Data groups 18–25 and 26–30 years were combined as the overlapping 90% confidence intervals suggested no difference between the two groups. AMH levels were age related, with values generally higher at younger ages, and decreasing with age. There was a wide range of AMH values observed within the reference intervals, especially in the younger groups.

Conclusion: This is the first report of AMH reference intervals using the Access 2 immunoassay analyzer. Results are consistent with published data and support that AMH concentrations in women generally decrease with age but with a wide range of values within the same age group.



"Assessment of the Access AMH assay revealed excellent linearity and good performance across the measuring range for both intra-assay and inter-assay precision, as would be expected for an automated immunoassay. This assay exhibited greatly increased sensitivity when compared to previous manual methods and aligned with literature from the manufacturer, allowing for accurate reporting to 0.1 pmol/L."

Pearson K, et al. Reproductive Biology and Endocrinology 2016;14:8.

Total system solutions

Complementing its comprehensive menu for immunoass testing, Beckman Coulter also offers a complete lineup c immunoassay systems that provide advanced testing while increasing productivity and reducing costs.

- **In one compact footprint, the Access 2 delivers enhanced sample handling, as well as exceptional laboratory efficiency and cost effectiveness**
- **Higher throughput is available with the UniCel DxI 600 and UniCel DxI 800 immunoassay systems**

Access 2

UniCel DxI 600

UniCel DxI 800

Partnering Today for a Stronger Tomorrow

Delivering high-quality assays, such as Access AMH, is part of Beckman Coulter's vision to advance care for every person. It is one component of a larger, integrated solution we call the Beckman Coulter Diagnostics Difference, the company's commitment to partnering with clinical laboratories to improve patient care.

Discover the difference.

"The switching from manual to automatic assays for serum AMH measurement is on the way because of their better precision, lower limit of quantification and test duration."

Pigny P, et al. Fertility and Sterility. 2016;105(4):1063–1069.

NOTES

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