(ICSI), assisted hatching, number of embryos transferred, and blastocyst transfer. A subgroup analysis of patients with polycystic ovary syndrome (PCOS) as their only infertility diagnosis was performed using the same model.

RESULTS: Our cohort included 8,430 patient cycles with elevated AMH and 2,186 patient cycles with ultrahigh AMH. Compared with women with elevated AMH, women with ultrahigh AMH were younger (31.1 vs 31.9 years, $P<0.0001$), more likely to be nulliparous (86.6% vs 83.2%, $P=0.0002$), and were almost twice as likely to carry the diagnosis of PCOS (67.5% vs 37.5%, $P<0.0001$). Women with ultrahigh AMH required less gonadotropins (1,688 vs 1,950 IU, $P<0.0001$) and had more oocytes retrieved (20 vs 18, $P<0.0001$), but they had higher rates of cycle cancellation due to risk of ovarian hyperstimulation syndrome (OHSS) (11.5% vs 5.5%, $P<0.0001$). After adjusting for covariates, the odds of live birth were significantly lower for women with ultrahigh AMH than for those with elevated AMH (OR 0.85, 95% CI 0.75-0.97). Similar findings were observed in the subanalysis of only PCOS patients.

CONCLUSIONS: Compared with women with elevated AMH, women with ultrahigh AMH ($\geq$10 ng/ml) are more likely to carry the diagnosis of PCOS. Ultrahigh AMH patients require less gonadotropin stimulation and have a higher oocyte yield; however, they are more likely to have cycle cancellation due to concern for OHSS, and they have significantly lower odds of live birth. We conclude that with elevated AMH, more is not always better for patient outcomes.

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SUCCESSFUL DRUG-FREE IVA (IN VITRO ACTIVATION) APPROACH WITH LAPAROSCOPY TO INCREASE VIABLE EMBRYOS IN POOR RESPONDER (POR) PATIENTS.

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OBJECTIVE: The success of IVF treatment in poor responder (POR) patients is low due to decreases in the number of retrieved oocytes. A recent study demonstrated that suppression of Hippo signaling in somatic cells of ovarian follicles induced secondary follicle growth, resulting in successful follicle growth in patients with primary ovarian insufficiency though in vitro activation (IVA). The aim of this study is to improve clinical outcome of IVF treatment in POR patients through induction of secondary follicle growth leading to increases in number of viable embryos by Drug-free IVA..

DESIGN: Prospective cohort study to improve clinical outcome of IVF treatment in POR patients.

MATERIALS AND METHODS: Under ethical approval for clinical study of Drug-free IVA, 79 patients who received written informed consent and met the Bologna criteria were enrolled from February 2016 to December 2017.. For Drug-free IVA, we excised partial ovarian tissues from one side of ovary under laparoscopic surgery. The ovarian cortex was dissected into 1-2 mm squares and cultured them overnight to suppress Hippo signaling pathway. After culture, these cubes were auto-transplanted beneath the serosa of Fallopian tubes and ovaries. Simultaneously, we made 7-9 linear cuts on the surface of contralateral side of ovary. After the surgery, patients received ovarian stimulation under short protocol with maintaining normal LH levels (<10 mIU/ml) for oocyte retrieval. The effects of Drug-free IVA were evaluated by counting the number of follicles at oocyte retrieval under trans-vaginal ultrasound monitoring and the number of retrieved oocytes, fertilization rate, cleavage rate, cryopreservation rate, clinical pregnancy rate, and miscarriage rate. The oocytes were allowed to fertilize either cIVF or ICSI and all embryo transfers were preformed using freeze-thawed embryos under hormone replacement protocol.

RESULTS: The median age of enrolled patients was 43.6 [38-48].Clinical outcome with this procedure was listed in Table 1.

CONCLUSIONS: The Drug-free IVA increased the number of mature follicles and also tend to increase the quality of oocytes. These data suggest a potential of Drug-free IVA to improve clinical outcome of IVF treatment in POR patients.

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MIDKINE CAN BE EVALUATED AS A NEW OVARIAN RESERVE MARKER AT POLYCYSTIC OVARY SYNDROME CASES EXCEPT FOR UNEXPLAINED INFERTILITY CASES.

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OBJECTIVE: The purpose of this study was to evaluate the levels of midkine (MK), a growth factor with a cytokine role, as a new biomarker for predicting ovarian reserve with the Anti-Müllerian Hormone (AMH) in patients who diagnosed with unexplained infertility (UI) and polycyctic ovary syndrome (PCOS) and underwent ICSI procedures.

DESIGN: A prospective, multicentered clinical study.

MATERIALS AND METHODS: The study prospectively included 120 patients (aged 22-43 years; the UI group, n = 60; the control group (fertile women), n = 60; the PCOS group, n=60) who underwent ICSI process. Serum levels of MK and the hormones FSH, LH, E2, PRL, AMH were measured on the 3rd day of menstrual cycle.

RESULTS: Mean values of hormones and MK levels for the control group were FSH 5.8 mIU/ml, LH 3.1 mIU/ml, E2 40.2 pg/ml, PRL 15.87 ng/ml, AMH 3.1 ng/ml and MK 252 pg/ml (The cut-off value). In addition, MII oocyte and the fertilisation rates were found 75 % and 93 %, respectively. These values for UI were FSH 6.0 mIU/ml (p>0.05), LH 2.99 mIU/ml (p>0.05), E2 41.8 pg/ml (p>0.05), PRL 15.46 ng/ml (p>0.05), AMH 2.99 ng/ml (p>0.05) and MK 250 pg/ml (The cut-off value; p>0.05). MII oocyte and the fertilisation rates for UI were detected 62 % and 80 %, respectively.

Table 1Clinical outcome following laparoscopically modified in vitro activation

Patients (n=79)	Average number of follicles at oocyte retrieval	Average number of retrieved oocytes	Fertilization rate (%)	Cleavage rate (%)	Cryopreservation rate (%)	Clinical pregnancy rate (%)	Miscarriage rate (%)
pre-op (240 cycles)	1.45[a]	1.39	58.3% (130/223)	57.0% (127/223)	19.7% (25/127)	3.7% (1/27)	100.0%(1/1)
post-op (226 cycles)	1.79[a']	1.54	64.7% (161/249)	63.9% (159/249)	13.8% (22/159)	18.4% (7/38) Ongoing : 3 Birth : 1(twins)	42.9% (3/7)

(a-a': p<0.05, t-test)

For the PCOS group, these were FSH 5.7 mIU/ml ($p<0.05$), LH 6.5 mIU/ml ($p<0.0001$), E2 43.8 pg/ml ($p<0.05$), PRL 15.47 ng/ml ($p>0.05$), AMH 5.89 ng/ml ($p<0.0000$) and MK 423 pg/ml (The cut-off value; $p<0.0000$). MII oocyte and the fertilisation rates for PCOS were detected 46 % ($p<0.00001$) and 53 % ($p<0.0000$), respectively.

CONCLUSIONS: Midkine can be evaluted as a new ovarian reserve marker at the PCOS cases except for the UI cases. MK levels were proportionally changed with AMH levels.

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IS ANTI-MULLERIAN HORMONE A MARKER FOR CARDIO-METABOLIC HEALTH IN REPRODUCTIVE AGE EUMENORRHEIC WOMEN? J. Sroga-Rios,[a] E. Greenwood,[b] H. Huddleston,[c] M. Cedars,[d] M. Diamond,[e] H. Zhang,[f] N. Santoro,[g] M. Pavone.[h] [a]Obstetrics and Gynecology, University of Cincinnati College of Medicine, West Chester, OH; [b]Obstetrics, Gynecology & Reproductive Sciences, UCSF, San Francisco, CA; [c]Obstetrics and Gynecology, University of California San Francisco, San Francisco, CA; [d]University of California San Francisco Center for Reproductive Health, Saint Barthélemy; [e]Augsta University, Augusta, GA; [f]Yale School of Public Health, New Haven, CT; [g]University of Colorado School of Medicine, Aurora, CO; [h]Northwestern Medicine, Chicago, IL.

OBJECTIVE: Menopause is associated with increased risk of cardiovascular disease however the relationship between reproductive and cardiometabolic aging in unclear. Our objective is to determine if anti-mullerian hormone (AMH), antral follicle count (AFC) and AMH/AFC ratio are markers of cardio-metabolic disease in reproductive age women with and without infertility.

DESIGN: Cross sectional cohort study in eumenorrheic women age 25-40 from two independent populations including a secondary analysis of 870 infertile women who participated in the AMIGOS (AMG) trial and 951 regular-cycling community controls (OVA).

MATERIALS AND METHODS: Women (ages 25-40) were enrolled into either study population and baseline demographics, ovarian reserve markers (AMH and AFC), and cardio-metabolic measures (CMM) were collected including body mass index (BMI), waist circumference (WC), blood pressure (BP) (AMG only), fasting glucose and insulin, lipids, and C reactive protein. We performed a multivariable linear regression to investigate the association of between ovarian reserve markers and CMM.

RESULTS: Several CMM were found to be negatively associated with AMH and AMH/AFC in the OVA population including BMI, WC, insulin, homeostasis model assessment-insulin resistance (HOMA-IR) and there was a positive association with high density lipids (HDL) and AMH/AFC (Table 1). Only BMI was negatively associated with AMH in the AMG cohort while AFC was not associated with any metabolic features in either group. Adjusting for BMI removed all AMH-CMM associations in the OVA group but in the AMG cohort increased diastolic BP was associated higher AMH (0.30, $p=0.03$).

CONCLUSIONS: Cross-sectional evidence suggests that a less favorable cardio-metabolic risk profile is mainly mediated by BMI rather than AMH in regularly cycling women despite infertility status. BMI appears to directly impact AMH since no association was seen on AFC. Future longitudinal studies are needed in order to determine relationship between AMH and BMI and the development of cardiovascular disease.

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OVARIAN RESERVE STATUS AND CARDIOVASCULAR FUNCTION IN WOMEN AFTER A HYPERTENSIVE COMPLICATED PREGNANCY. L. M. Jorissen,[a] D. A. Pattinaja,[a] J. A. Bons,[b] O. Valkenburg,[a] M. E. Spaanderman,[c] R. V. Golde.[d] [a]Reproductive Medicine, Maastricht University Medical Centre, Maastricht, Netherlands; [b]Central Diagnostic Laboratory, Maastricht University Medical Centre, Maastricht, Netherlands; [c]Obstetrics and Gynaecology, Maastricht University Medical Centre, Maastricht, Netherlands; [d]Obstetrics and Gynecology, Gynaecologist, Maastricht, Netherlands.

OBJECTIVE: There is evidence for a close relation between markers of vascular (dys)function and ovarian reserve status. Also, pre-existent vascular dysfunction is highly associated with the occurrence of preeclampsia (PE) during pregnancy. Therefore, it is speculated that cardiovascular dysfunction may be similarly involved in processes that regulate depletion of the ovarian follicle pool and the occurrence of PE. The objective of the present study is to evaluate ovarian reserve status and markers of vascular function among women with a history of PE.

DESIGN: This was a hospital-based observational cohort study, conducted at a tertiary referral center at the Maastricht University Medical Center in The Netherlands.

MATERIALS AND METHODS: The study group consisted of 162 women with a history of hypertensive disease during pregnancy (gestational hypertension, preeclampsia and/or HELLP-syndrome). Controls constituted 80 healthy women with previous uncomplicated pregnancies. Both groups were included at least six months postpartum. Exclusion criteria were a current pregnancy, breastfeeding, hormonal medication and/or a history of ovarian surgery. Primary and secondary outcome parameters were serum AMH level, vascular function parameters i.e., body mass index (BMI), blood pressure (BP) and fasting serum levels of insulin, glucose and lipid profile. Baseline characteristics, ovarian reserve status and vascular function parameters were compared between both groups by Student t-test or Mann-Whitney U test. Linear regression analysis using log-transformation was used to adjust for known confounders, such as age.

RESULTS: Median serum AMH levels were 20% higher among patients vs. controls (respectively 2.40±3.20 μg/L and 2,00±2.90 μg/L). Univariate analysis showed no significant difference in AMH levels between both groups. Cardiovascular function parameters were significantly higher in the patient group vs. controls, systolic BP 4%, diastolic BP 5%, triglycerides 32%, glucose 4% and insulin levels 99%, whereas HDL cholesterol was 6% lower in patients.

CONCLUSIONS: PE cases were clearly associated with unfavorable changes in cardiovascular function and lipid parameters. However, no difference in ovarian reserve status was observed between the study group and con-

Linear regression models for CMM and ovarian reserve markers, adjusted for age and site

	AMH: Coefficient (p-value)		AFC: Coefficient (p-value)		AMH/AFC: Coefficient (p-value)	
	AMG	OVA	AMG	OVA	AMG	OVA
BMI (Kg/m^2)	**-0.27 (0.02)**	**-0.42 (< 0.001)**	-0.005 (0.81)	-0.009 (0.76)	2.6 (0.10)	**-11.2 (< 0.001)**
WC (cm)	-0.31 (0.27)	**-0.98 (< 0.001)**	-0.02 (0.57)	-0.002 (0.97)	3.7 (0.43)	**-25.5 (< 0.001)**
Fasting insulin (mg/dL)	-0.20 (0.45)	**-0.17 (0.02)**	-0.04 (0.42)	0.005 (0.83)	0.21 (0.95)	-2.7 (0.11)
HOMA-IR	-0.06 (.33)	**-0.05 (0.02)**	-0.009 (0.42)	0.0005 (0.94)	0.05 (0.95)	-0.92 (0.06)
HDL cholesterol (mg/dL)	0.11 (0.57)	0.38 (0.05)	-0.05 (0.13)	-0.43 (0.53)	3.9 (0.23)	**14.8 (0.001)**