Patients were not consecutive but selected as a cohort matched by outcome and age. IVF outcomes included term deliveries, biochemical pregnancies, first trimester miscarriages, ectopic pregnancies and women that did not become pregnant.

MATERIALS AND METHODS: Sera were assayed by ELISAs by personnel blinded to outcomes. Results were compared between groups using two-tailed Student's t test for normally distributed data and Mann Whitney for non-parametric data.

RESULTS: As early as day 24 IGF-I, IGF-II and IGFBP-1 were predictive of IVF outcome. On days 24 and 28, IGF-I levels were higher in patients with an early pregnancy loss compared to patients with a normal term delivery (day 24; $p=0.007$, day 28; $p=0.0004$) and IGF-II levels were lower in women who had an early pregnancy loss compared with women who delivered ($p<0.0001$). Patients who had an ectopic pregnancy had significantly higher mean IGFBP-1 levels compared with patients from all other groups ($p=0.0001$). Moreover, a rise in IGFBP-1 level from day 24 to day 30 was higher in women who had a successful term delivery compared to all other groups ($p<0.0001$). IGF-I and IGF-II were not predictive of ectopic pregnancies.

CONCLUSION: The ability to predict IVF outcome four days prior to the initial pregnancy test makes IGF-I, IGF-II and IGFBP-1 potential markers in clinical settings.

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PEAK ESTRADIOL (E2) AT THE TIME OF hCG TRIGGER AS A PREDICTOR OF SMALL FOR GESTATIONAL AGE (SGA). M. Vega, A. Breborowicz, S. Morris, I. Sirota, E. Gonzales, M. D. Keltz. Obstetrics and Gynecology, St. Luke's-Roosevelt Hospital Center, New York, NY.

OBJECTIVE: Recently, reports have emerged on an association between elevated peak e2 at the time of hcg trigger and small for gestational age (SGA). We seek to determine the value of peak e2 on predicting SGA.

DESIGN: Retrospective Cohort Study.

MATERIALS AND METHODS: This retrospective cohort study was drawn from a combination of our Continuum Reproductive Center's IVF database and the St. Luke's Roosevelt delivery database from 2007 to 2012. Singleton live births >24 weeks resulting from non-donor fresh IVF cycles were analyzed. A Receiver Operator Curve (ROC) analysis was performed on peak E2 levels on fresh cycles, Odds Ratio (OR) were also calculated.

RESULTS: A total of 204 singleton pregnancies >24 weeks resulted from 2105 fresh IVF cycles in this time period. ROC analysis revealed an Area Under the Curve (AUC)= 0.54. The optimal cutoff point was 2209 pg/ml. OR=1.82 [0.83-4.01]; p=0.1379, for pregnancies above the cutoff point. Sensitivity: 73% [56%-86%]. Specificity: 40% [33%-48%]. PPV: 22% [15%-30%]. NPV: 87% [77%-94%].

CONCLUSION: The value of peak e2 at the time of hcg trigger for prediction of SGA is limited. Although recent studies have shown increased Odds Ratio, in our diverse population this findings were not reproduced. Larger prospective studies are needed to correlate our findings.

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INCREASED BODY IRON STORES ARE ASSOCIATED WITH OBESITY, OLIGOMENORRHEA AND LOW ANTI-MÜLLERIAN HORMONE LEVELS IN WOMEN WITH POLYCYSTIC OVARY SYNDROME. M-J. Chen,[a,c] W.-S. Yang,[b,c] H.-N. Ho,[a,c] Y.-S. Yang.[a,c] [a]Obstetrics and Gynecology, National Taiwan University Hospital, Taipei, Taiwan; [b]Internal Medicine, National Taiwan University Hospital, Taipei, Taiwan; [c]College of Medicine, National Taiwan University, Taipei, Taiwan.

OBJECTIVE: To determine the association between body iron stores, obesity and ovarian reserve in women with PCOS.

DESIGN: A cross-sectional study.

MATERIALS AND METHODS: A total of 156 untreated, consecutive women with PCOS were enrolled in this study. The body mass index (BMI), insulin resistance index, ovarian volume, total antral follicle count, and serum ferritin and AMH levels were all measured for further analyses.

RESULTS: Obese women (BMI $\geq$ 25 kg/m2) with PCOS had significantly higher ferritin levels ($P = 0.0006$), and a higher prevalence of amenorrhea ($P = 0.039$), but lower AMH levels ($P < 0.0001$) than non-obese women with PCOS. The ferritin levels were positively related to age and BMI, but inversely related to AMH levels. Women with PCOS in the highest ferritin level tertile tended to have lower antral follicle count (P for trend: 0.063) and higher risk of low AMH levels (odds ratio: 2.65; 95% confidence interval: 1.20 – 5.82; P for trend: 0.011) in comparison with those with lowest ferritin tertile. Women with higher severity of oligomenorrhea tended to have higher ferritin levels (P for trend: 0.009).

CONCLUSION: Ferritin levels were positively related to age, BMI, insulin resistance, and the risk of amenorrhea, but negatively related to AMH levels in women with PCOS. The findings suggested that elevated iron stores are associated with the obesity, oligomenorrhea, and reduced ovarian reserve in women with PCOS.

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ASSOCIATION BETWEEN SEX STEROID, OVARIAN RESERVE AND VITAMIN D LEVELS IN HEALTHY FERTILE WOMEN. E. Chang, Y. S. Kim, H. J. Won, M. J. Kim, W. S. Lee, T. K. Yoon. Fertility Center of CHA Gangnam Medical Center, Department of Obstetrics and Gynecology, CHA University, Seoul, Republic of Korea.

OBJECTIVE: In addition to its main role as maintaining calcium and phosphorous homeostasis and determining quality of bone mineralization, vitamin D has recently suggested as regulator of reproductive function. However mechanism why vitamin D may be associated with reproductive outcome is lacking so far. The aim of this study was to investigate association of plasma vitamin D level with sex steroid and ovarian reserve in healthy fertile women.

DESIGN: Prospective cross sectional study.

MATERIALS AND METHODS: The study involved 71 healthy non-obese parous women with regular menstrual cycles and no history of infertility. All patients were evaluated for their ovarian reserve (AMH, FSH, Antral follicle count, ovarian volume), vitamin D status (25(OH)D, 1,25(OH)D3), sex steroid (E2, Testosterone, DHEAS, progesterone), insulin resistance status and lipid profile.

RESULTS: Mean age and BMI of participants were 33.8 years (range 27-38) and 20.6 kg/m^2(range 15.9-26.1), respectively. Using common cut-off value for vitamin D status in Korean population, 54.9% (n=39) of the participants had 25(OH)D levels<10ng/ml (vitamin D deficiency), 42.3% (n=30) had 25(OH)D levels between 10ng/ml and 30ng/ml (vitamin D insufficiency), and 2.8%(n=2) had 25(OH)D levels >30ng/ml (sufficiency). Serum 25(OH)D level was not correlated with DHEAS level but positively associated with total testosterone ($r=0.408$, $P<0.001$), free testosterone ($r=0.244$, $P=0.04$) and bio available testosterone levels ($r=0.243$, $P=0.041$). While AMH correlated well with antral follicle count ($r=0.360$, $P=0.004$), FSH and ovarian volume there were no correlations between vitamin D levels.

CONCLUSION: This is first study to show that vitamin D is associated with testosterone level in healthy fertile women. Although we did not observe association with ovarian reserve, vitamin D may function as modulator of androgen activity thus give positive effect on reproduction. Possible causality between vitamin D and testosterone deserve further evaluation.

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QUALITY INDEX ASSESSMENT OF VAGINAL TEMPERATURE BASED FERTILITY PREDICTION AND COMPARISON WITH LUTEINISING HORMONE TESTING, ULTRASOUND FOLLICULOMETRY AND OTHER HOME CYCLE MONITORS. S. Papaioannou,[a] B. H. Al Wattar,[a] R. C. Milnes,[c] T. G. Knowles.[b] [a]Obstetrics and Gynaecology, Heart of England NHS Foundation Trust, Birmingham, West Midlands, United Kingdom; [b]Faculty of Medical and Veterinary Sciences, University of Bristol, Bristol, Somerset, United Kingdom; [c]Fertility Focus Limited, Warwick, Warwickshire, United Kingdom.

OBJECTIVE: To compare the accuracy of vaginal temperature based fertile period prediction (OvuSense fertility monitor-OS) with that of LH urine strip testing (LH) and the combination of LH and ultrasound folliculometry (US/LH) as well as with the traditional oral temperature method (OT). Using published methodology, to calculate a 'Quality Index' (QI) for OS, LH, US/LH and OT, and to compare this with the published QIs for other commercially available cycle monitors.

DESIGN: Prospective, longitudinal, comparative study.

MATERIALS AND METHODS: 21 women who met the study inclusion criteria contributed a total of 81 cycles to the study. Participants used OS for night time vaginal core body temperature monitoring, used LH urine test stips to identify ovulation and trigger ultrasound follicle tracking scans and also recorded daily oral morning temperature. The main outcome measures were QI comparisons between OS, OT, LH and US/LH predicted fertile period, comparison of conception per fertile day probability between OS and US/LH and comparison of OS QI with published QIs for other commercially available cycle monitors.

RESULTS: All three pairwise QI comparisons were statistically significant: US/LH – OT, $p < 0.001$; OS – OT, $p < 0.001$; US/LH – OS, $p = 0.036$ (paired t-tests). The OS predicted probability of conception per fertile day curve closely matched that of US/LH. With a QI of 94.48%, OS performance was superior to that of OT (QI=65%). The OS QI was higher than published QI values of other cycle monitors.

CONCLUSION: OS provides an almost continuous, user controlled monitoring alternative to US/LH spot tests with an accurate fertile period prediction which is superior to oral temperature testing. It appears to be an improvement on available cycle monitors. Vaginal, core-body temperature assessment represents a promising method for monitoring fertility and potentially other physiological functions.

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THE COMPARISON OF THE EFFECT ON IVF RESULTS OF METFORMIN AND INSULIN USED DURING IVF CYCLES OF INFERTILE WOMEN WITH OVERT DIABETES. C.-H. Kim,[a] K.-H. Lee,[a] S.-K. Kwon,[a] J.-Y. Min,[a] J.-W. Ahn,[b] B.-M. Kang.[a] [a]Obstetrics and Gynecology, College of Medicine, University of Ulsan, Asan Medical Center, Seoul, Republic of Korea; [b]Obstetrics and Gynecology, College of Medicine, University of Ulsan, Ulsan University Hospital, Ulsan, Republic of Korea.

OBJECTIVE: To compare the effect of metformin and insulin on controlled ovarian stimulation (COS) and IVF results in infertile women with type 2 diabetes undergoing IVF/intracytoplasmic sperm injection (ICSI).

DESIGN: Retrospective cohort study.

MATERIALS AND METHODS: A total of 52 consecutive IVF/ICSI cycles were included in 35 women with preexisting type 2 diabetes who were treated with either the metformin (metformin group, 29 cycles) or the insulin (insulin group, 23 cycles) for glycemic control. IVF/ICSI cycles in which a GnRH antagonist multiple dose protocol (MDP) is used for COS was included in this study.

RESULTS: There were no significant differences in patient's characteristics between metformin and insulin groups. There were also no differences in total dose and days of recombinant human FSH (rhFSH) administered, and numbers of retrieved oocytes, mature oocytes, fertilized oocytes, and embryos transferred between the two groups. However, the number of grade 1 or 2 embryos was significantly higher in metformin group of 3.9 ± 2.9 compared with 2.2 ± 2.3 in insulin group ($P = .025$). Follicular fluid (FF) TNF-a and IL-6 concentrations at oocyte retrieval were significantly lower in metformin group than in insulin group ($P = .030$, $P = .009$). There were no differences in the clinical pregnancy rate, embryo implantation rate, miscarriage rate and multiple pregnancy rate between the two groups.

CONCLUSION: The use of metformin for glycemic control is more effective in reducing FF TNF-a and IL-6 levels in COS cycles and improving embryo quality compared with insulin treatment in infertile women with type 2 diabetes undergoing IVF/ICSI.

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THE PREDICTIVE VALUE OF SERUM ANTI-MÜLLERIAN HORMONE LEVELS AFTER SHORT-ACTING GONADOTROPHIN-RELEASING HORMONE AGONIST TREAMENT ON CONTROLLED OVARIAN STIMULATION. Y. Ye, R. R. Wu, J. Du. Reproductive Medical Center, Southern Medical University Zhongshan Boai Hospital, Zhongshan City, Guangdong, China; Reproductive Medical Center, Southern Medical University Zhongshan Boai Hospital, Zhongshan City, Guangdong, China; Reproductive Medical Center, Southern Medical University Zhongshan Boai Hospital, Zhongshan City, Guangdong, China.

OBJECTIVE: To investigate the influence of short-acting GnRH-a on serum AMH levels and its value as a predictor of ovarian response in COS.

DESIGN: Prospective longitudinal study.

MATERIALS AND METHODS: The study included 116 cycles of 116 "standard patients" who underwent IVF cycles with a short-acting GnRH-a(Diphereline®) luteal phase long protocol. The level of serum AMH, FSH, LH, FSH/LH, E_2 and AFC were estimated at baseline and day 14 following GnRH-a. Serum AMH were compared before and after pituitary down-regulation, and the relationship with oocyte count were reckoned. Regress line of AMH after down-regulation with oocyte count was statistical analyzed.

RESULTS: 1. After treatment of GnRH-a, higher basal AMH fell down and lower basal AMH grew up. Using the ROC curve, we found the cutoff point was 2.16μg/L. In basal AMH<2.16μg/L group were 51 cases, the average of AMH grew up from(1.21$\pm$0.50)μg/L to (1.96$\pm$1.57)μg/L after down-regulation ($P<0.01$). In basal AMH$\geq$2.16μg/L group were 65 women, their AMH descended from (4.26$\pm$1.93)μg/L to (2.55$\pm$1.48)μg/L after down-regulation($P<0.01$). Consistent with this variation trend, the expected number of oocyte count would be better. 2. After control factor of age, the partial correlation of oocyte count and serum AMH after down-regulation were 0.357($P<0.01$), it was higher than basal serum AMH (r=0.350,$P<0.01$). 3. The regress line of serum AMH levels after pituitary down-regulation with oocyte count was Y=8.198+1.363X.[Y was oocyte count, X was AMH after down-regulation (μg/L)] ($P<0.01$).

CONCLUSION: The dynamics of serum AMH after the treament of short-acting GnRH-a was that higher basal AMH fell down and lower basal AMH grew up. Consistent with this, the expected number of oocyte count would be better. The serum AMH after pituitary down-regulation had stronger correlation with oocyte count than basal serum AMH, which implies that serum AMH after pituitary down-regulation is better predictors of ovarian response than basal AMH during COS.

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EFFECTS OF LEVONOGESTREL RELEASING INTRAUTERINE DEVICE ON LYMPHANGIOGENESIS OF ADENOMYOSIS. B. H. Yun,[a,c] S. Cho,[b,c] S. H. Kim,[d] S. K. Seo,[a,b] Y. S. Choi,[a,c] B. S. Lee.[b,c] [a]Obstetrics and Gynecology, Severance Hospital, Yonsei University College of Medicine, Yonsei University Health System, Seoul, Republic of Korea; [b]Obstetrics and Gynecology, Gangnam Severance Hospital, Yonsei University College of Medicine, Yonsei University Health System, Seoul, Republic of Korea; [c]Institute of Women's Life Medical Science, Yonsei University College of Medicine, Yonsei University Health System, Seoul, Republic of Korea; [d]Department of Pathology, Severance Hospital, Yonsei University College of Medicine, Yonsei University Health System, Seoul, Republic of Korea.

OBJECTIVE: Levonogestrel releasing intrauterine device (LNG-IUD) has been widely used in large diseases spectrum. In Adenomyosis patients, LNG-IUD has shown effective symptom control but the exact mechanism has not been fully understood. The aim of this study was to investigate and compare the development of lymphatic vessels and the production of lymphangiogenic growth factors in patients with adenomyosis and in those with LNG-IUD treated adenomyosis.

DESIGN: Case control study.

MATERIALS AND METHODS: Full thickness uterine myometrial samples from 40 patients who underwent hysterectomy were collected. Immunohistochemical statining using antibodies against podoplanin (D2-40), and lymphatic vessel endothelial hyaluronan receptor 1 (LYVE-1) were performed on 20 samples of adenomyosis, 20 samples of adenomyosis treated with LNG-IUD. Endometrial samples from patients with cervical intraepithelial neoplasia was used as controls. The lymphvascular density (LVD) was analyzed for each sample.

RESULTS: Lymphatic vessels were identified by immunohistochemical staining with specificlymphatic endothelial cell markers D2-40 and LYVE-1. Only D2-40 displayed a high to moderate immunostaining pattern in comparison to LYVE-1. The LVD of D2-40 was significantly higher in endometrium of adenomyosis patients, in comparison to the endometrium of controls and LNG-IUD treated group. However, no significant difference in endometrial LVD was noted between the controls and LNG-IUD treated group. In myometrium, the LVD was also significantly higher in adenomyosis patients than the controls and LNG-IUD treated group, but no significant differences were noted between the controls and LNG-IUD treated group.