

Wider implications of the findings: The alteration of the protein profile could be a cause or a result of some metabolic differences induced by gonadotropins resulting in lower oocyte quality in c-IVF compared to NC-IVF. Cell signalling and apoptosis will be better understood with the identification of the most important players amongst the FF proteins.

Trial registration number: Not applicable.

P-689 Intramuscular progesterone (IM-P4) administration is associated with better pregnancy rates in frozen–thawed blastocyst transfers, regardless of progesterone serum levels

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Study question: Does IM-P4 administration 5–7 days before embryo transfer enrich the endometrium in a way that progesterone-in-oil enhances pregnancy rates in frozen–thawed embryo transfer cycles (FET)?

Summary answer: There is no difference in pregnancy rates according to P4 levels. However, IM-P4 route seems to induce better pregnancy outcomes.

What is known already: Many IVF practitioners' use high doses of IM-P4 in the luteal phase to enhance implantation in FET cycles. It appears that serum estradiol (E2) and P4 pave the endometrium in order to establish an artificially prepared lining. Luteal support is essential to maintain endometrium favorable to embryo implantation. Several P4 luteal phase support protocols for FET are routinely used and safely administered. There are P4 preparations available for vaginal, oral or intramuscular (IM) administrations with no clear correlation to serum levels or enhanced pregnancy rates.

Study design, size, duration: Retrospective study included 297 FET cycles between July 2014 and November 2015. Patients underwent endometrium preparation using E2 starting from 1st to 3rd day of menstrual cycle. P4 was administered when a proper endometrium was measured above 8 mm in thickness. P4 was placed vaginal ($n = 229$), vaginal + oral ($n = 30$) or vaginal + im ($n = 22$). Levels of progesterone were measured at the embryo transfer day. Patients were allocated into groups according to P4 levels as <10 ng/ml ($n = 59$), 10 – 20 ng/ml ($n = 157$) and >20 ng/ml ($n = 41$).

Participants/materials, setting, methods: All embryos were frozen at blastocyst stage. The blastocysts were warmed and checked for survival and quality; and one to four frozen–thawed embryos were transferred. The demographic characteristics of patients and pregnancy rates were compared among groups according to P4 route and P4 levels categories. Also, regression model was applied to assess the influence of P4 levels and route in pregnancy rates and adjusted for confounders.

Main results and the role of chance: Patients ages were 36.8 ± 4.4 with a mean of 1.9 ± 0.8 embryos warmed and 1.8 ± 0.6 embryos transferred. P4 levels according with P4 route groups were higher in the vaginal + IM group (vaginal: 16.9 ± 27.5 ; vaginal + oral: 14.0 ± 5.4 ; vaginal + im: 32.6 ± 44.2 ; $p = 0.039$), but there was no difference on endometrial thickness (vaginal: 9.0 ± 1.8 ; vaginal + oral: 8.9 ± 1.6 ; vaginal + im: 8.9 ± 1.2 ; $p = 0.996$). Patients who received P4 through vaginal + im route presented higher pregnancy rates (72.7%) than vaginal (51.5%, $p = 0.052$) or vaginal + oral (56.7%, $p = 0.013$). When patients were split into groups according to P4 levels, the clinical pregnancy rates were similar (P4: <10 : 50.8%; P4: 10 – 20 : 56.1%; P4: >20 : 53.7%; $p = 0.786$). A multiple logistic regression model were built to evaluate the P4 level or route in the pregnancy rates adjusted to patients age and number of embryos transferred. The P4 levels were not associated to pregnancy chance (OR: 1.0, $p = 0.852$), on the other hand, when patients received P4 vaginal + IM the chance of became pregnant was 2.5 higher and marginally significant (OR: 2.5; $p = 0.061$).

Limitations, reasons for caution: This is a retrospective study, without randomization according to P4 route of administration, and then the groups were not homogeneously distributed. A multiple regression was applied to adjust for confounders, but a randomized prospective study would be necessary to better conclusions regarding differences in pregnancy according to P4 administration route.

Wider implications of the findings: Despite of subsequent higher progesterone levels, it seems that IM-P4 route, and do not progesterone levels itself, has a positive effect in pregnancy rates. It is known that IM-P4 can present a higher progesterone level stability and it might be the reason for those results.

Trial registration number: Not applicable.

P-690 The impact of excision of benign non-endometriotic ovarian cysts on ovarian reserve: a systematic review and meta-Analysis

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Study question: Does excision of benign non-endometriotic ovarian cysts cause damage to ovarian reserve as determined by Anti-Müllerian Hormone (AMH)?

Summary answer: Excision of benign non-endometriotic ovarian cysts seems to markedly reduce circulating AMH. It remains uncertain whether this reflects a real decline in ovarian reserve.

What is known already: Benign non-endometriotic ovarian cysts are very common and often require surgical excision. However, there has been a growing concern over the possible damaging effect of this surgery on ovarian reserve with potential compromise to fertility potential.

To date, several studies have investigated the impact of ovarian cystectomy on ovarian reserve as determined by circulating AMH. Most of these studies showed a postoperative decline in circulating AMH. However, given the relatively small size of these studies, further evidence is required to allow a firm conclusion.

Study design, size, duration: This meta-analysis included all cohort studies and randomized trials that analyzed changes of serum AMH concentrations after excision of benign non-endometriotic ovarian cysts. The included studies were conducted in the period between January 2000 and November 2015.

Participants/materials, setting, methods: The meta-analysis included nine studies with 305 patients who underwent excision of benign non-endometriotic ovarian cysts. Primary outcome was postoperative change in serum AMH level. Secondary outcomes were changes in postoperative serum follicle-stimulating hormone (FSH) concentration and antral follicle count (AFC).

Main results and the role of chance: Pooled analysis of 305 patients showed a statistically significant decline in serum AMH concentration after ovarian cystectomy (weighted mean difference (WMD) -1.00 ng/ml; 95% confidence interval (CI) -0.35 to -1.66), although heterogeneity between studies was high. Subgroup analysis including studies with a three-month follow-up, studies using Gen II AMH assay and studies using Immunotech (IOT) AMH assay improved heterogeneity and still showed significant postoperative decline of circulating AMH (WMD -1.50 , -0.88 , and -1.56 , respectively). Sensitivity analysis including studies with low risk of bias and excluding studies with possible confounding factors still showed a significant decline in circulating AMH.

Limitations, reasons for caution: Given the high heterogeneity between included studies, this meta-analysis should be interpreted with caution. More well designed studies with long-term follow-up are needed, to draw a firm conclusion.

Wider implications of the findings: Women in reproductive age group presenting with benign non-endometriotic cysts should be counselled properly regarding the effect of surgical excision of ovarian cysts on ovarian reserve and reproductive performance in the future.

Trial registration number: None.