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## 编 辑

中华生殖与避孕杂志编辑委员会  
200237, 上海市老沪闵路 779 号  
电话: (021)64438169  
传真: (021)64438975  
Email: randc@sippr.org.cn  
http://www.randc.cn

## 总编辑

乔 杰

## 编辑部主任

王黎茜

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# 基于单次促排卵周期的累积分娩 / 活产率 专家共识

中国医师协会生殖医学专业委员会

通信作者：乔杰，Tel: +86-10-82265080, Email: jie.qiao@263.net

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**【摘要】** 目前，如何评价辅助生殖治疗的成功尚存在争议，越来越多的学者呼吁将一次完整卵巢刺激周期的累积分娩 / 活产率作为一次促排卵的关键衡量指标。结合近年来国内外相关研究进展，本文对累积分娩 / 活产率的定义、临床意义、计算方法以及影响因素达成部分专家共识，以指导一次促排卵累积分娩 / 活产率的临床应用。

**【关键词】** 累积分娩率；累积活产率；完整刺激周期；获卵数；年龄

· 标准与规范 ·

**Cumulative delivery/live birth rate of complete ovarian stimulation cycle consensus**

*Professional Committee on Reproductive Medicine, Chinese Medical Doctors Association*

*Corresponding author: Qiao Jie, Tel: +86-10-82265080, Email: jie.qiao@263.net*

**【Abstract】** At present, it is controversial how to accurately define the success of assisted reproductive technology (ART). More and more scholars have called for the cumulative delivery/live birth rate of a complete ovarian stimulation cycle as a key successful indicator of ART. Combined with domestic and foreign research progress in recent years, a consensus was reached by part experts on the definition, clinical significance, calculation methods and influencing factors of cumulative delivery/live birth rate, in order to guide the clinical application of the cumulative delivery/live birth rate.

**【Key words】** Cumulative delivery rate; Cumulative live birth rate; Complete ovarian stimulation cycle; Number of retrieved oocytes; Age

# 多囊卵巢综合征患者的体质量指数和脂代谢水平对促性腺激素释放激素拮抗剂方案妊娠结局的影响

黄晓燕 吕红 吴春香 沈鉴东 孟艳 丁卫 冒韵东 王嫱 刘嘉茵 刁飞扬

210029 南京医科大学第一附属医院生殖医学中心, 生殖医学国家重点实验室(黄晓燕、吴春香、沈鉴东、孟艳、丁卫、冒韵东、王嫱、刘嘉茵、刁飞扬); 211166 南京医科大学公共卫生学院(吕红)

通信作者: 刁飞扬, Tel: +86-13801583408, Email: phenix\_y@163.com

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**【摘要】**目的 探讨多囊卵巢综合征(PCOS)患者体质量指数(BMI)和脂代谢水平对促性腺激素释放激素拮抗剂(GnRH-A)方案体外受精/卵胞质内单精子显微注射(IVF/ICSI)周期卵巢反应、胚胎质量及妊娠结局的影响。方法 纳入以GnRH-A方案行第一个IVF/ICSI取卵周期的762例PCOS患者,对其新鲜胚胎移植周期及后继的冻融胚胎移植周期行回顾性分析。探讨BMI、胆固醇(TC)、甘油三酯(TG)、高密度脂蛋白(HDL)、低密度脂蛋白(LDL)水平与卵巢反应、胚胎质量和新鲜胚胎/冻融胚胎移植周期临床妊娠结局的关系。结果 ①BMI与TG、LDL呈正相关,与HDL呈负相关( $P<0.05$ );②卵巢反应和胚胎质量相关指标与BMI、TG、LDL呈负相关( $P<0.05$ ),与HDL呈正相关( $P<0.05$ );③多因素logistic回归分析结果显示BMI是冻融囊胚移植周期活产的危险因素;HDL是新鲜胚胎移植周期临床妊娠和活产的保护因素,也是卵裂期胚胎冻融胚胎移植周期活产的保护因素;LDL和TC是冻融胚胎移植周期临床妊娠的危险因素。结论 对于PCOS患者而言,过高的BMI( $BMI \geq 28 \text{ kg/m}^2$ )和异常的脂代谢水平对GnRH-A促排卵方案的卵巢反应、胚胎质量和临床妊娠结局均具有不良影响。

**【关键词】**多囊卵巢综合征(PCOS);促性腺激素释放激素拮抗剂(GnRH-A);脂代谢;体质量指数(BMI);临床妊娠结局

**基金项目:**国家自然科学基金面上项目(81471429);生殖医学国家重点实验室创新基金项目(SKLRM-GC201804)

**Effect of body mass index and lipid metabolism on pregnancy outcome of polycystic ovary syndrome patients undergoing *in vitro* fertilization/intracytoplasmic sperm injection using gonadotropin-releasing hormone antagonist protocol** Huang Xiaoyan, Lyu Hong, Wu Chunxiang, Shen Jiandong, Meng Yan, Ding Wei, Mao Yundong, Wang Wei, Liu Jiayin, Diao Feiyang

State Key Laboratory of Reproductive Medicine, Center of Clinical Reproductive Medicine, the First Affiliated Hospital of Nanjing Medical University, Nanjing 210029, China (Huang XY, Wu CX, Shen JD, Meng Y, Ding W, Mao YD, Wang W, Liu JY, Diao FY); School of Public Health, Nanjing Medical University, Nanjing 211166, China (Lyu H)

Corresponding author: Diao Feiyang, Tel: +86-13801583408, Email: phenix\_y@163.com

**【Abstract】 Objective** To explore the effect of body mass index (BMI) and lipid metabolism on ovarian response, embryo quality and pregnancy outcome of polycystic ovary syndrome (PCOS) patients who underwent *in vitro* fertilization/intracytoplasmic sperm injection (IVF/ICSI) using gonadotropin-releasing hormone antagonist (GnRH-A) protocol. **Methods** Totally 762 infertile PCOS patients undergoing the first IVF/ICSI cycle using GnRH-A protocol were recruited. The clinical data in the fresh embryo transfer/frozen-thawed embryo transfer cycles were analyzed retrospectively. To investigate the influence of BMI and lipid metabolism on ovarian response, embryo quality and clinical outcome, the values of BMI, total cholesterol (TC), triglyceride (TG), high-density lipoprotein (HDL) and low-density lipoprotein (LDL) were collected from fresh embryo transfer/frozen-thawed embryo transfer cycles. **Results** 1) There was a positive correlation between BMI and TG/LDL, and a negative correlation between BMI and HDL ( $P < 0.05$ ); 2) BMI, TG, LDL negatively correlated with the ovarian response and embryo quality, while HDL positively correlated with the ovarian response and embryo quality ( $P < 0.05$ ). 3) For clinical pregnancy outcome, logistic regression analysis showed that BMI was the risk factor in frozen-thawed blastocyst embryo transfer cycles; HDL was the protective factor in fresh embryo transfer cycles and frozen-thawed cleavage embryo transfer cycles; LDL and TC were the risk factors in frozen-thawed embryo transfer cycles. **Conclusion** Excessive BMI, especially BMI  $\geq 28$  kg/m<sup>2</sup>, and abnormal lipid metabolism adversely affected PCOS patients' ovarian response, embryo quality and clinical pregnancy outcome in GnRH-A protocol.

**【Key words】** Polycystic ovary syndrome (PCOS); Gonadotropin-releasing hormone antagonist (GnRH-A); Lipid metabolism; Body mass index (BMI); Clinical pregnancy outcome

**Fund program:** Surface Program of National Natural Science Foundation of China (81471429); State Key Lab. of Reproductive Medicine Funding for Innovation (SKLRM-GC201804)

# 多囊卵巢综合征不孕症患者非月经期诱导排卵临床观察

龚衍 曾玫芝 熊东升 刘伟信 梁梅玉

610045 成都, 四川省妇幼保健院生殖医学中心

通信作者: 刘伟信, Tel: +86-17707108061, Email: liuweixind@163.com

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**【摘要】** 目的 比较月经期、非月经期诱导排卵对多囊卵巢综合征 (polycystic ovary syndrome, PCOS) 患者的临床疗效。方法 通过回顾性队列研究将 529 个 PCOS 不孕妇女的诱导排卵治疗周期按用药时期分为试验组 (非月经期用药,  $n=217$ ) 和对照组 (月经期用药,  $n=312$ ), 再按药物不同分为氯米芬亚组 (试验组,  $n=151$ ; 对照组,  $n=202$ ) 和来曲唑亚组 (试验组,  $n=66$ ; 对照组,  $n=110$ )。B 超监测排卵, 观察各种临床指标。结果 试验组卵泡生长时间 [氯米芬亚组 ( $11.9 \pm 3.7$ ) d、来曲唑亚组 ( $12.1 \pm 3.2$ ) d] 均短于对照组 [氯米芬亚组 ( $17.5 \pm 3.9$ ) d、来曲唑亚组 ( $19.0 \pm 4.7$ ) d] ( $P=0.011$ ,  $P=0.018$ )。试验组补佳乐用量 [氯米芬亚组 ( $6.42 \pm 2.19$ ) mg、来曲唑亚组 ( $4.19 \pm 2.76$ ) mg] 均小于对照组 [氯米芬亚组 ( $9.31 \pm 3.58$ ) mg、来曲唑亚组 ( $7.58 \pm 3.83$ ) mg] ( $P=0.012$ ,  $P=0.015$ )。试验组来曲唑亚组人绝经期促性腺激素 (human menopausal gonadotropin, hMG) 用量 [( $209.4 \pm 50.2$ ) IU] 小于对照组 [( $293.5 \pm 61.4$ ) IU] ( $P=0.010$ )。试验组和对照组 2 种诱导排卵药物排卵日子宫内膜厚度、排卵数、排卵率、卵巢过度刺激综合征发生率、临床妊娠率、多胎妊娠率、流产率差异均无统计学意义 ( $P>0.05$ )。结论 PCOS 患者在非月经期诱导排卵可以取得与传统月经期诱导排卵相似的排卵率、临床妊娠率, 并且缩短了卵泡生长时间、减少了辅助用药剂量, 是诱导排卵方案的一种灵活应用。

**【关键词】** 多囊卵巢综合征 (PCOS); 不孕症; 非月经期; 诱导排卵

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**Clinical study of ovulation induction in infertility women with polycystic ovary syndrome in the non-menstrual period** Gong Yan, Zeng Jiuzhi, Xiong Dongsheng, Liu Weixin, Liang Meiyu

Reproductive Medicine Center, Sichuan Provincial Hospital For Woman and Children, Chengdu 610045, China

(Gong Y, Zeng JZ, Xiong DS, Liu WX, Liang MY)

Corresponding author: Liu Weixin, Tel: +86-1770710806, Email: liuweixind@163.com

**【Abstract】 Objective** To investigate the effects of ovulation induction in infertile women with polycystic ovary syndrome (PCOS) in the non-menstrual period. **Methods** A total of 529 cycles of infertile women with PCOS were divided into study group (non-menstrual period ovulation induction,  $n=217$ ) and control group (menstrual period ovulation induction,  $n=312$ ) according to the period of ovulation induction, then they were divided into clomiphene citrate (CC) subgroup (study group,  $n=151$ ; control group,  $n=202$ ), and letrozole (LE) subgroup (study group,  $n=66$ ; control group,  $n=110$ ). The follicle diameter and endometrial thickness were monitored by the transvaginal ultrasound, and the clinical indexes were observed. **Results** The stimulation follicle days in study group [CC subgroup ( $11.9 \pm 3.7$ ) d, LE subgroup ( $12.1 \pm 3.2$ ) d] were less than those in control group [CC subgroup ( $17.5 \pm 3.9$ ) d, LE subgroup ( $19.0 \pm 4.7$ ) d] ( $P=0.011$ ,  $P=0.018$ ). The dosages of estradiol in study group [CC subgroup ( $6.42 \pm 2.19$ ) mg, LE subgroup ( $4.19 \pm 2.76$ ) mg] were less than those in control group [CC subgroup ( $9.31 \pm 3.58$ ) mg, LE subgroup ( $7.58 \pm 3.83$ ) mg] ( $P=0.012$ ,  $P=0.015$ ). Human menopausal gonadotropin (hMG) level was less in study group [LE subgroup ( $209.4 \pm 50.2$ ) IU] than in control group [LE subgroup ( $293.5 \pm 61.4$ ) IU] ( $P=0.010$ ). Endometrial thickness, the rate of ovulation, ovarian hyperstimulation syndrome (OHSS) occurrence rate, clinical pregnancy rate, multiple pregnancy rate, and spontaneous abortion rate were not significantly different between the two groups. **Conclusion** Ovulation induction in non-menstrual period in PCOS is a valuable and flexible method due to the similar ovulation and clinical pregnancy rate, less stimulation follicle days, less dosage of estradiol and hMG compared with the traditional method.

**【Key words】** Polycystic ovary syndrome (PCOS); Infertility; Non-menstrual period; Ovulation induction

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# 血管内皮生长因子基因多态性与多囊卵巢综合征遗传易感性的关联性

黄茜 郝雅丽 甄秀丽 王娜 周荣秒 李琰

050011 石家庄, 河北医科大学第四医院分子生物学研究室(黄茜、王娜、周荣秒、李琰), 生殖医学科(郝雅丽、甄秀丽)

通信作者: 李琰, Tel: +86-311-86095337, Email: lykx1962@163.com

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**【摘要】** 目的 探讨血管内皮生长因子 (vascular endothelial growth factor gene, VEGF) 基因 rs2010963G/C 单核苷酸多态性 (single nucleotide polymorphism, SNP) 和 rs833061T/C SNP 与多囊卵巢综合征 (polycystic ovary syndrome, PCOS) 遗传易感性之间的关系。方法 采用聚合酶链反应-连接酶检测反应 (polymerase chain reaction-ligase detection reaction, PCR-LDR) 法对 118 例 PCOS 患者和 130 例健康对照 VEGF 基因 rs2010963G/C SNP 和 rs833061T/C SNP 进行基因分型。结果 健康对照组和 PCOS 组 VEGF 基因 rs2010963G/C SNP G、C 等位基因频率分别为 60.8%、39.2% 和 69.9%、30.1%, 两者的分布差异具有统计学意义 ( $P=0.033$ )。VEGF 基因 rs2010963G/C SNP GG、GC、CC 基因型频率对照组分别为 36.2%、49.2%、14.6%, PCOS 组分别为 50.9%、38.1%、11.0%。与 GG 基因型相比, 携带 GC、GC+CC 基因型可能降低了 PCOS 的发病风险, OR 值分别为 0.55(95% CI=0.32~0.95) 和 0.55(95% CI=0.33~0.91)。VEGF 基因 rs833061T/C SNP 等位基因频率和基因型频率总体分布在对照组和 PCOS 组间差异无统计学意义 ( $P>0.05$ )。应用 2LD 软件对 VEGF 基因 rs2010963G/C SNP 和 rs833061T/C SNP 进行联合分析显示, 2 个多态性位点之间存在连锁不平衡现象 ( $D'=0.82$ )。应用 EH 软件对这 2 个多态性位点进行单体型分析, 结果显示 GT 是最常见的单体型。结论 VEGF 基因 rs2010963G/C SNP 与 PCOS 的发病风险显著相关, 与 GG 基因型相比, 携带 C 等位基因 (GC+CC) 的妇女患 PCOS 风险较低。

**【关键词】** 血管内皮生长因子 (VEGF); 单核苷酸多态性 (SNP); 多囊卵巢综合征 (PCOS); 遗传易感性

**Association between the vascular endothelial growth factor gene polymorphism and the risk of polycystic ovary syndrome** Huang Xi, Hao Yali, Zhen Xiuli, Wang Na, Zhou Rongmiao, Li Yan

Departments of Molecular Biology (Huang X, Wang N, Zhou RM, Li Y), Department of Reproductive Medicine (Hao YL, Zhen XL), Hebei Medical University, Fourth Hospital, Shijiazhuang 050011, China

Corresponding author: Li Yan, Tel: +86-311-86095337, Email: lykx1962@163.com

**【Abstract】 Objective** To explore the association of vascular endothelial growth factor (VEGF) gene rs2010963 G/C single nucleotide polymorphism (SNP) and rs833061 T/C SNP with susceptibility to polycystic ovary syndrome (PCOS). **Methods** The genotypes of *VEGF* gene rs2010963G/C SNP and rs833061T/C SNP were performed by polymerase chain reaction-ligase detection reaction (PCR-LDR) method in 118 PCOS patients (PCOS group) and 130 healthy controls (control group). **Results** The frequencies of G allele and C allele of the *VEGF* gene rs2010963 G/C SNP in the control were 60.8%, 39.25% and 69.9%, 30.1% in PCOS group, respectively. There was a significant difference in the allele distribution of the rs2010963 G/C SNP between the two groups ( $P=0.033$ ). The GG, GC and CC genotype frequencies of *VEGF* gene rs2010963 G/C SNP were 36.2%, 49.2%, 14.6% in control group and 50.9%, 38.1%, 11.0% in PCOS group, respectively. The women carrying GC, GC+CC genotype had a lower risk of PCOS compared with the women with the GG genotype. The OR was 0.55 (95% CI=0.32–0.95) and 0.55 (95% CI=0.33–0.91), respectively. No significant difference was observed in the frequency of the genotype and allele of *VEGF* gene rs833061 T/C SNP between the two groups ( $P>0.05$ ). *VEGF* gene rs2010963G/C SNP and rs833061T/C SNP were combined for analysis using 2LD software. Results showed that linkage disequilibrium exists between these two SNPs ( $D'=0.82$ ). The haplotype of these two SNPs was analyzed using EH software. The result revealed that the GT was the most frequent haplotype. **Conclusion** The finding in our pilot study suggests that the *VEGF* gene rs2010963 G/C SNP is significantly associated with the risk of PCOS. The women carrying the C allele (GC+CC genotype) had a lower risk of PCOS compared with the women with GG genotype.

**【Key words】** Vascular endothelial growth factor (VEGF); Single nucleotide polymorphism (SNP); Polycystic ovary syndrome (PCOS); Genetic susceptibility

# 子宫内膜异位症合并不孕女性卵泡液细胞因子表达水平的研究

张丽 马彩虹 张馨雨 杨璞玉 陈雁容

100191 北京大学第三医院生殖医学中心(张丽、马彩虹、张馨雨、杨璞玉、陈雁容);  
050071 石家庄, 河北省计划生育科学技术研究院, 国家卫生计生委计划生育与优生重点实验室(张丽)

通信作者: 马彩虹, Tel: +86-10-82268326, Email: macaihong@263.net

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**【摘要】目的** 研究子宫内膜异位症(endometriosis, EMS)合并不孕女性卵泡液细胞因子表达水平。**方法** 选取行卵胞质内单精子注射(intracytoplasmic sperm injection, ICSI)治疗患者,以既往腹腔镜或开腹手术诊断EMS的女性( $n=29$ )例为EMS组,根据EMS临床病例分型再分为腹膜型EMS( $n=11$ )和卵巢型EMS( $n=18$ )2个亚组。选择同期行ICSI,且既往腹腔镜或开腹手术诊断无EMS的女性( $n=20$ )为对照组。所有患者于取卵日留取第1管无血液污染的卵泡液。用酶联免疫吸附法检测两组卵泡液中白介素(interleukin, IL)-6、IL-8、IL-15、IL-18、IL-1 $\beta$ 、胰岛素样生长因子1(insulin-like growth factor 1, IGF-1)和肿瘤坏死因子- $\alpha$ (tumor necrosis factor alpha, TNF- $\alpha$ )含量;记录所有患者获卵情况及受精情况。**结果** 腹膜型EMS亚组IL-18水平(170.0 ng/L)显著高于对照组(142.3 ng/L,  $P<0.001$ ),TNF- $\alpha$ 水平(240.5 ng/L)显著低于对照组(287.8 ng/L,  $P=0.01$ )。卵巢型EMS亚组IL-18表达(189.0 ng/L)显著高于对照组(142.3 ng/L,  $P<0.001$ )。腹膜型及卵巢型EMS组分别与对照组比较,获卵数、M<sub>II</sub>卵数、双原核(2PN)数及优质胚胎数差异均无统计学意义( $P>0.05$ ),EMS组促性腺激素(Gn)使用总量显著高于对照组( $P<0.001$ )。**结论** EMS合并不孕女性卵泡液中细胞因子IL-18的表达升高,EMS不影响术后体外受精(IVF)/ICSI周期卵母细胞成熟及胚胎形成。

**【关键词】** 子宫内膜异位症(EMS); 不孕症; 体外受精-胚胎移植(IVF-ET); 卵泡液; 细胞因子

### Study on the expression of cytokines of follicle fluid in endometriosis-associated infertility women

Zhang Li, Ma Caihong, Zhang Xinyu, Yang Puyu, Chen Yanrong

Reproductive Medicine Center, Peking University Third Hospital, Beijing 100191, China (Zhang L, Ma CH, Zhang XY, Yang PY, Chen YR); Family Planning Science & Technology Research Institute, Key Laboratory of Family Planning & Health Birth, National Health & Family Planning Commission, Shijiazhuang 050071, China (Zhang L)

Corresponding author: Ma Caihong, Tel: +86-10-82268326, Email: macaihong@263.net

**【Abstract】 Objective** To study the expression of cytokines in follicular fluid of endometriosis (EMS)-associated infertility women. **Methods** From April 2017 to August 2017, 29 cases with EMS who underwent intracytoplasmic sperm injection (ICSI) in the Reproductive Center of Peking University Third Hospital were enrolled in EMS group and then divided into peritoneal EMS subgroup and ovarian EMS subgroup. Twenty cases without EMS who underwent ICSI at the same time were enrolled as control group. All cases with or without EMS were diagnosed by laparoscopy or laparotomy previously. The first tube of follicular fluid without blood from two groups of patients were reserved on the oocyte retrieval day. The expression of interleukin (IL)-6, IL-8, IL-15, IL-18, IL-1 $\beta$ , insulin-like growth factor (IGF)-1 and tumor necrosis factor alpha (TNF- $\alpha$ ) in follicular fluid of two groups were detected by enzyme-linked immunosorbent assay. The number of oocytes retrieved and the condition of fertilization were recorded in two groups. **Results** The expressions of IL-18 in peritoneum EMS subgroup (170.0 ng/L) was higher than in control group (142.3 ng/L,  $P<0.001$ ); the level of TNF- $\alpha$  in peritoneum EMS subgroup (240.5 ng/L) was significantly lower than that in control group (287.8 ng/L,  $P=0.01$ ). The expression of IL-18 in follicular fluid in ovarian EMS subgroup (189.0 ng/L) was also significantly higher than that in control group (142.3 ng/L,  $P<0.001$ ). Compared with control group, there were no differences in numbers of oocytes retrieval, M<sub>II</sub> oocytes, 2PN and good-quality embryos in the peritoneal and ovarian EMS subgroups ( $P>0.05$ ). But the total gonadotropin (Gn) dosage was significantly higher than that in control group ( $P<0.001$ ). **Conclusion** The levels of cytokines IL-18 in follicular fluid of EMS-associated infertility women increase. EMS had no influence on the outcomes of subsequent *in vitro* fertilization (IVF)/ICSI cycle.

**【Key words】** Endometriosis (EMS); Infertility; *In vitro* fertilization-embryo transfer (IVF-ET); Follicle fluid; Cytokines

# 卵裂期与囊胚期新鲜胚胎移植对子代出生性别比例影响的 Meta 分析

丁锦丽 张怡 尹太郎 杨菁

430060 武汉大学人民医院生殖医学中心, 湖北省辅助生殖与胚胎发育医学临床研究中心

通信作者: 杨菁, Tel: +86-27-88041911, Email: dryangqing@hotmail.com

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**【摘要】** 目的 评价新鲜周期卵裂期与囊胚期胚胎移植对子代出生性别的影响。方法 采用 Meta 分析的方法, 利用计算机检索 PubMed、Embase、Medline 和 Cochrane library、维普 (VIP)、中国生物医学文献数据库 (CMB)、中国知网全文数据库 (CNKI) 和万方数据库。检索时间自建库至 2017 年 12 月, 查找关于卵裂期和囊胚期新鲜胚胎移植对新生儿出生性别比例影响的相关研究, 按照纳入和排除标准对文献进行筛选。对纳入文献进行资料提取和质量评价后, 利用 Stata12.0 软件进行统计学分析, 并进一步进行亚组分析和敏感性分析, 评估纳入文献的发表偏倚风险。结果 共纳入 16 篇文献。Meta 分析结果显示: 囊胚期移植组的新生儿男/女比值显著高于卵裂期胚胎移植组, 差异具有统计学意义 ( $OR=1.12$ ,  $95\% CI=1.07\sim 1.16$ ,  $P<0.001$ ); 在亚组分析中, 时间亚组结果表明, 在 2007 年前、后 2 个亚组中, 囊胚移植组的新生儿男/女比值均高于卵裂期胚胎移植组, 差异均具有统计学意义 (2007 年前:  $OR=1.29$ ,  $95\% CI=1.10\sim 1.51$ ,  $P=0.002$ ; 2007 年后:  $OR=1.10$ ,  $95\% CI=1.06\sim 1.15$ ,  $P<0.001$ ); 而在地区亚组分析结果显示, 在美洲、亚洲和欧洲 3 个亚组中, 囊胚移植组的新生儿男/女比值均高于卵裂期胚胎移植组, 可信区间均完全位于无效线右侧, 提示差异均具有显著统计学意义 (美洲亚组:  $OR=1.20$ ,  $95\% CI=1.05\sim 1.37$ ,  $P=0.008$ ; 亚洲亚组:  $OR=1.11$ ,  $95\% CI=1.05\sim 1.18$ ,  $P<0.001$ ; 欧洲亚组:  $OR=1.10$ ,  $95\% CI=1.07\sim 1.17$ ,  $P=0.008$ )。结论 在新鲜移植周期中, 与卵裂期胚胎移植相比, 囊胚移植可能增加子代男性比例, 但该结论仍需更多的大样本、高质量、多中心的随机对照研究加以验证。

**【关键词】** 卵裂期; 囊胚期; 新鲜胚胎移植; 性别比例; Meta 分析

**Effect of cleavage stage and blastocyst stage embryo transfer on offspring sex ratio in fresh cycle: a Meta-analysis** Ding Jinli, Zhang Yi, Yin Tailang, Yang Jing

Reproductive Medical Center, Renmin Hospital of Wuhan University & Hubei Clinic Research Center for Assisted Reproductive Technology and Embryonic Development, Wuhan 430060, China (Ding JL, Zhang Y, Yin TL, Yang J)  
Corresponding author: Yang Jing, Tel: +86-27-88041911, Email: dryangqing@hotmail.com

**【Abstract】 Objective** To evaluate the sex ratio in fresh embryo transfer at cleavage stage and blastocyst stage. **Methods** The relevant papers were electronically searched in PubMed, Embase, Medline, Cochrane library, VIP database, China Biology Medicine disc (CBMdisc), China National Knowledge Infrastructure (CNKI) and Wanfang database. Literatures were screened according to the inclusion and exclusion criteria. After data extraction and quality assessment, Meta-analysis was performed using Stata 12.0 software, and subgroup analysis and sensitivity analysis were performed. **Results** Sixteen studies were scrutinized for this Meta-analysis. There was a significantly higher ratio of male to female at blastocyst stage fresh embryo transfer ( $OR=1.12$ ,  $95\% CI=1.07-1.16$ ,  $P<0.001$ ). In time subgroup analysis, the ratio of male to female at blastocyst stage was significantly higher than that of cleavage stage in both before 2007 and after 2007 subgroups (before 2007:  $OR=1.29$ ,  $95\% CI=1.10-1.51$ ,  $P=0.002$ ; after 2007:  $OR=1.10$ ,  $95\% CI=1.06-1.15$ ,  $P<0.001$ ). In region subgroup analysis, the ratio of male to female at blastocyst stage was significantly higher than that of cleavage stage in three subgroups (America subgroup:  $OR=1.20$ ,  $95\% CI=1.05-1.37$ ,  $P=0.008$ ; Asia subgroup:  $OR=1.11$ ,  $95\% CI=1.05-1.18$ ,  $P<0.001$ ; Europe subgroup:  $OR=1.10$ ,  $95\% CI=1.07-1.17$ ,  $P=0.008$ ). **Conclusion** Compared with fresh embryo transfer at cleavage stage, blastocyst stage fresh embryo transfer was associated with a significantly higher ratio of male to female. However, it still needs larger sample, high quality, multi-center randomized controlled study to be verified.

**【Key words】** Cleavage stage; Blastocyst stage; Fresh embryo transfer; Sex ratio; Meta-analysis

## 武汉市和黄石市妇女妊娠意愿影响因素研究

吴美琴 俞婷 张秉政 马君瑞 陈秋杏 年云鹏 余景芳 邹甜甜 田琴 贺安琦 吴慧文  
喻妍 滕菲 黄黎敏 邹宇量

430015 武汉市妇幼保健院(吴美琴); 430071 武汉大学健康学院(俞婷、张秉政、马君瑞、陈秋杏、  
年云鹏、贺安琦、吴慧文、喻妍、滕菲、黄黎敏、邹宇量); 435000 黄石市妇幼保健院(余景芳、  
邹甜甜); 435000 黄石市二医院(田琴)

通信作者: 邹宇量, Tel: +86-27-68759118\*4, Email: zouyl@whu.edu.cn

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**【摘要】目的** 探讨武汉市和黄石市妇女妊娠意愿的影响因素。**方法** 采用现况研究,对2016年8—11月期间因产前保健、人工流产和分娩在湖北省两家市级妇幼保健院就诊的孕产妇进行自填式问卷调查。以生态学模型为理论框架探讨影响妇女妊娠意愿的个人、人际、机构、社区、政策等多个方面因素。**结果** 单因素分析结果表明:年龄( $P=0.027$ )、婚姻状况( $P<0.001$ )、小孩性别( $P<0.001$ )、伴侣工作状态( $P=0.004$ )、伴侣关系满意度评分( $P<0.001$ )、首次性行为是否避孕( $P=0.039$ )、流产次数( $P=0.001$ )、医疗保险类型( $P=0.001$ )、伴侣意愿( $P<0.001$ )、亲密女性朋友影响程度( $P=0.001$ )、是否考虑双方父母意见( $P=0.007$ )与妊娠意愿相关联;多元线性回归结果表明:年龄35~45岁( $\beta=1.930$ ,  $P=0.016$ )、已婚( $\beta=-4.877$ ,  $P<0.001$ )、伴侣意愿一般( $\beta=3.040$ ,  $P<0.001$ )以及伴侣意愿强烈( $\beta=4.200$ ,  $P<0.001$ )、伴侣关系满意度评分9~10分( $\beta=2.038$ ,  $P=0.037$ )、伴侣有工作( $\beta=2.964$ ,  $P=0.022$ )、新农合/城镇居民医疗保险与妊娠意愿较高相关联( $\beta=1.466$ ,  $P=0.007$ );而已有小孩且为男孩与妊娠意愿较低相关联( $\beta=-2.583$ ,  $P<0.001$ );研究未显示流产次数、年龄24~35岁、已有小孩但为女孩、儿女双全、伴侣关系满意度评分6~8分、亲密女性朋友的影响、是否考虑双方父母的意见、有城镇职工医疗保险、有商业医保与妊娠意愿存在关联( $P>0.05$ )。**结论** 妇女妊娠意愿与个体、人际、政策等因素相关联,利用生态学模型能够较好地解释此关联,有助于产科临床及保健工作中识别不同妊娠意愿水平的妇女,以为其提供针对性的服务。

**【关键词】** 妊娠意愿; 影响因素; 多因素分析

· 现场调查 ·

**Study on the influential factors of pregnancy intention in Wuhan and Huangshi City** Wu Meiqin, Yu Ting, Zhang Bingzheng, Ma Junrui, Chen Qiuxing, Nian Yunpeng, Yu Jingfang, Zou Tiantian, Tian Qin, He Anqi, Wu Huiwen, Yu Yan, Teng Fei, Huang Limin, Zou Yuliang

Wuhan Maternal and Child Health Hospital, Wuhan 430015, China (Wu MQ); Wuhan University School of Health Science, Wuhan 430071, China (Yu T, Zhang BZ, Ma JR, Chen QX, Nian YP, He AQ, Wu HW, Yu Y, Teng F, Hang LM, Zou YL); Huangshi Maternity and Children's Health Hospital, Huangshi 435000, China (Yu JF, Zou TT); the Second Hospital of Huangshi, Huangshi 435000, China (Tian Q)

Corresponding author: Zou Yuliang, Tel: +86-27-68759118\*4, Email: zouyl@whu.edu.cn

**【Abstract】 Objective** To explore the influential factors of female pregnancy intention in Wuhan and Huangshi City. **Methods** Adopting a method of prevalence study, self-administrated questionnaire survey was conducted among women who went to both of city-level maternal and child healthcare hospital in Hubei Province for antenatal care, induced abortion or childbirth from August to November in 2016. We established an ecological theoretical framework to describe the influential factors of the pregnancy intention in terms of individual, interpersonal, institutional, community and policy. **Results** Results of the univariate analysis showed that age ( $P=0.027$ ), marital status ( $P<0.001$ ), gender of children ( $P<0.001$ ), partner's working status ( $P=0.004$ ), ratings of relationship satisfaction ( $P<0.001$ ), contraception at the first sexual intercourse ( $P=0.039$ ), times of induced abortion ( $P=0.001$ ), type of medical insurance ( $P=0.001$ ), partner's will ( $P<0.001$ ), the influence of female friends on pregnancy intention ( $P=0.001$ ) and whether to consider the views of both parents ( $P=0.007$ ) were associated with pregnancy intention. Result of multiple linear regression showed that association of age group of 35–45 years ( $\beta=1.930$ ,  $P=0.016$ ), married ( $\beta=-4.877$ ,  $P<0.001$ ), partner's intention of moderate-level ( $\beta=3.040$ ,  $P<0.001$ ) and strong-level ( $\beta=4.200$ ,  $P<0.001$ ), rating of relationship satisfaction 9–10 ( $\beta=2.038$ ,  $P=0.037$ ), partner's employed ( $\beta=2.964$ ,  $P=0.022$ ), the new rural cooperative/urban residents medical insurance ( $\beta=1.466$ ,  $P=0.007$ ) with pregnancy intention were positive; while the association of already having a son with pregnancy intention was negative ( $P<0.05$ ); the association between frequency of abortion, age group of 24–35 years, having a daughter, having both son and daughter, the influence of the close female friends, whether to consider the views of both parents, having the medical insurance for urban workers and commercial medical insurance with pregnancy intention were not found in this research ( $P>0.05$ ). **Conclusion** Female pregnancy intention has association with factors of individual, interpersonal and policy, and the association can be explained preferably with ecological theoretical framework. It is helpful to recognize women with pregnancy intention of different levels and the women can enjoy specific service from obstetrical and health department.

**【Key words】** Pregnancy intention; Influential factors; Multifactor analysis



## 卵巢储备功能减退患者自然周期取卵 / 排卵后继续黄体期促排卵的临床观察

赵贝 孙丽君 胡继君 冯营营 李哲 张俊伟

450052 郑州大学第三附属医院生殖医学中心

通信作者: 孙丽君, Tel: +86-13253528099, Email: docsjl@sina.com

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**【摘要】** 目的 探讨卵巢储备功能减退 (DOR) 患者黄体期促排卵的可行性。方法 应用回顾性队列研究分析本院接受体外受精 / 卵胞质内单精子显微注射 (IVF/ICSI) 助孕的 DOR 患者, 共 290 个周期的临床资料, 分别采用自然周期方案 (164 个周期)、自然周期取卵 / 排卵后继续黄体期促排卵方案 (128 个周期) 行 IVF/ICSI。比较患者临床、实验室及妊娠结局的各项指标。结果 两组的年龄、不孕年限、体质指数 (BMI)、血清基础卵泡刺激素 (FSH) 及抗苗勒管激素 (AMH) 水平相比较, 差异均无统计学意义 ( $P>0.05$ ); 两组未获卵率及双原核 (2PN) 受精率差异均无统计学意义 ( $P>0.05$ ); 黄体期促排卵组扳机日黄体生成素 (LH)  $[(3.39 \pm 1.04) \text{ mIU/L}]$  及提前排卵率  $[0.8\% (1/128)]$  低于自然周期组  $[(14.45 \pm 4.23) \text{ mIU/L}, 16.0\% (26/162)]$  ( $P<0.001$ )。扳机雌二醇 ( $E_2$ )  $[(1\ 046.84 \pm 725.70) \text{ ng/L}]$ 、获卵数  $(2.6 \pm 2.1)$ 、优质胚胎率  $[47.9\% (90/188)]$  均高于自然周期组  $[(351.94 \pm 179.75) \text{ ng/L}, 0.8 \pm 0.7, 31.5\% (23/73)]$  ( $P<0.001, P<0.001, P=0.017$ ); 黄体期促排卵组及自然周期组的临床妊娠率分别为 26.8%、20.0%, 早期流产率分别为 13.3%、16.7%, 累积妊娠率分别为 28.3%、20.0%, 组间比较差异均无统计学意义 ( $P>0.05$ )。结论 自然周期取卵 / 排卵后继续黄体期促排卵方案获卵数增多, 优质胚胎率升高, 提前排卵率降低, 对于 DOR 患者而言, 是一种可行的促排卵方案。

**【关键词】** 卵巢储备功能减退 (DOR); 黄体期促排卵; 体外受精 / 卵胞质内单精子显微注射 (IVF/ICSI)

**Feasibility analysis of luteal-phase ovarian stimulation after the natural cycle oocyte retrieval/ovulation in diminished ovarian reserve patients**

Zhao Bei, Sun Lijun, Hu Jijun, Feng Yingying, Li Zhe, Zhang Junwei

Reproductive Center of the Third Affiliated Hospital of Zhengzhou University, Zhengzhou 450052, China (Zhao B, Sun LJ, Hu JJ, Feng YY, Li Z, Zhang JW)

Corresponding author: Sun Lijun, Tel: +86-13253528099, Email: docslj@sina.com

**【Abstract】 Objective** To investigate the feasibility of luteal-phase ovarian stimulation in diminished ovarian reserve (DOR) patients. **Methods** A retrospective cohort study was used to analyze 290 cycles in infertile women with DOR, who underwent *in vitro* fertilization/intracytoplasmic sperm injection (IVF/ICSI), of which 164 natural cycle protocol cycles and 128 luteal-phase ovarian stimulation protocol after the natural cycle oocyte retrieval or ovulation cycles. Then the clinical and laboratory indicators were compared between the two groups. **Results** There was no significant difference in age, infertility, body mass index (BMI), serum basal follicle stimulating hormone (FSH) and anti-Müllerian hormone (AMH) levels between the two groups ( $P>0.05$ ). There was no significant difference in the rates of unobtained and two pronucleus (2PN) fertilization between the two groups ( $P>0.05$ ). Luteinizing hormone (LH) [ $3.39\pm 1.04$  mIU/L] and advance ovulation rate [0.8% (1/128)] were lower than those in the natural cycle group [ $14.45\pm 4.23$  mIU/L, 16.0% (26/162)] (all  $P<0.001$ ). The trigger estrogen ( $E_2$ ) [ $1\ 046.84\pm 725.70$  ng/L], the number of retrieved eggs ( $2.6\pm 2.1$ ), and the rate of high-quality embryos [47.9% (90/188)] were all higher than those of the natural cycle group [ $351.94\pm 179.75$  ng/L,  $0.8\pm 0.7$ , 31.5% (23/73)] ( $P<0.001$ ,  $P<0.001$ ,  $P=0.017$ ). The clinical pregnancy rate (26.8% and 20.0%), the abortion rate (13.3% and 16.7%) and the cumulative pregnancy rate (28.3% and 20.0%) in the lutein phase prolongation group and the natural cycle group were not statistically different ( $P>0.05$ ). **Conclusion** In luteal-phase ovarian stimulation protocol, the number of acquired eggs increased, the rate of high-quality embryos increased, and the rate of premature ovulation decreased, so it is a feasible ovulation-promoting protocol for patients with DOR.

**【Key words】** Diminished ovarian reserve (DOR); Luteal-phase ovarian stimulation; *In vitro* fertilization/intracytoplasmic sperm injection (IVF/ICSI)

## 卵巢储备功能评估指标对高卵泡刺激素人群体外受精 - 胚胎移植结局预测的研究

王雪 李秋圆 张少娣 赵华 张翠莲

450000 郑州, 河南省人民医院生殖医学研究所

通信作者: 张翠莲, Tel: +86-371-65580857, Email: luckyzcl@qq.com

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**【摘要】**目的 探讨卵巢功能评估指标对基础卵泡刺激素 (bFSH) 水平增高的人群体外受精 (IVF) 结局的预测价值。方法 回顾性病例对照研究分析 bFSH  $\geq 10$  IU/L 接受 IVF/ 卵胞质内单精子显微注射 - 胚胎移植 (ICSI-ET) 治疗的患者 505 个周期。其中年龄  $< 35$  岁者共 171 个周期, 年龄  $\geq 35$  岁者共 374 个周期。2 个年龄段者分别以抗苗勒管激素 (AMH)  $\leq 1.1 \mu\text{g/L}$  或 AMH  $> 1.1 \mu\text{g/L}$  分为 A ( $n=69$ )、B 组 ( $n=102$ ) 和 C ( $n=248$ )、D 组 ( $n=86$ )。比较 4 组患者的基线资料、周期取消率、临床妊娠率、着床率、早期流产率, 并对 IVF 周期是否取消周期和是否临床妊娠的影响因素行 logistic 回归分析。结果 随着年龄的增长和 AMH 水平降低, 高 bFSH 人群的 IVF 结局变差。对于年龄  $< 35$  岁和  $\geq 35$  岁的患者在低 AMH 组 (A 组和 C 组) 的取消周期率 (因未取卵 + 获卵数为 0 + 劣质胚胎) (31.88%, 38.89%) 均高于高 AMH 组 (B 组和 D 组) (18.63%,  $P=0.046$ ; 10.47%,  $P=0.001$ ), 差异均有统计学意义; 临床妊娠率 (38.89%, 25.93%) 与高 AMH 组 (62.26%, 38.46%) 比较, 差异无统计学意义 ( $P>0.05$ ), 但有降低趋势; 早期流产率 (14.28%, 42.85%) 均高于高 AMH 组 (6.10%,  $P=0.437$ ; 0,  $P=0.027$ ), 并在高龄患者中差异显著。进一步回归分析显示: 该周期是否取消周期与 bFSH 值呈正相关, 与窦卵泡计数 (AFC) 呈负相关; 仅年龄与 IVF 新鲜周期的临床妊娠率呈负相关。结论 年龄和 AMH 是影响高 FSH 人群 IVF 结局的因素, 可用以指导临床。而联合 AFC 和 bFSH 对取消周期有预测作用, 年龄对新鲜移植周期的临床妊娠结局有良好的预测作用。

**【关键词】**体外受精 - 胚胎移植 (IVF-ET); 抗苗勒管激素 (AMH); 基础卵泡刺激素 (bFSH); 基础窦卵泡数; 年龄; 妊娠结局

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**Study of ovarian reserve markers as predictors of *in vitro* fertilization-embryo transfer outcome in increased-basic follicle stimulating hormone population**

Wang Xue, Li Qiuyuan, Zhang Shaodi, Zhao Hua, Zhang Cuilian

Reproductive Center of Henan Province People's Hospital, Zhengzhou 450000, China (Wang X, Li QY, Zhang SD, Zhao H, Zhang CL)

Corresponding author: Zhang Cuilian, Tel: +86-371-65580857, Email: luckyzcl@qq.com

**【Abstract】 Objective** To explore the predictive value of ovarian reserve markers for people with increased basic follicle stimulating hormone (bFSH) levels in *in vitro* fertilization (IVF) outcomes. **Methods** A retrospective analysis of 545 cycles of patients with bFSH  $\geq 10$  IU/L receiving IVF/intracytoplasmic sperm injection-embryo transfer (ICSI-ET) treatment was performed. Patients in 171 cycles were  $<35$  years old and patients in 374 cycles were  $\geq 35$  years old. They were divided into group A ( $n=69$ ) or group B ( $n=102$ ) and group C ( $n=248$ ) or group D ( $n=86$ ) according to anti-Müllerian hormone (AMH)  $\leq 1.1$   $\mu\text{g/L}$  or AMH  $>1.1$   $\mu\text{g/L}$ , respectively. Baseline data, cycle cancellation rate, clinical pregnancy rate, implantation rate and early abortion rate were compared among these 4 groups. Logistic regression analysis was performed to determine the correlation between ovarian reserve markers and cycle cancellation and clinical pregnancy. **Results** With the increase of age and AMH, IVF outcomes decreased in the high bFSH population, retrieved oocytes and available embryos decreased also. In low AMH groups (group A, group C), the cancellation rates of the IVF cycles (due to not get eggs and no oocyte retrieval and poor-quality embryo) (31.88%, 38.89%) were higher than those in high AMH groups (18.63%,  $P=0.046$ ; 10.47%,  $P=0.001$ ), the difference was significant; the clinical pregnancy rates (38.89%, 25.93%) were lower than those in high AMH groups (62.26%, 38.46%) with no significant differences ( $P>0.05$ ); the early abortion rates (14.28%, 42.85%) were higher than those in high AMH group (6.10%,  $P=0.437$ ; 0,  $P=0.027$ ). It was found that bFSH value was positively related to whether the cycle was cancel, while the antral follicle count (AFC) was negatively related to whether the cycle was cancel. Only the age was negatively related to the clinical pregnancy rate of IVF fresh cycle. **Conclusion** The age and AMH level are factors affecting IVF outcomes in patients with high level of FSH, which can be used to guide the clinical practice. Joint of AFC and bFSH to cycle cancellation, and age to fresh transplant clinical pregnancy have good prediction effects.

**【Key words】** *In vitro* fertilization and embryo transfer (IVF-ET); Anti-Müllerian hormone (AMH); Basic follicle stimulating hormone (bFSH); Antral follicle count (AFC); Age; Pregnancy outcome

**Fund program:** National Natural Science Foundation of China (81701444)

## 激素替代周期中冻融囊胚体外培养时间对妊娠结局的影响

邱乒乓 王焯 林津 纪红 张玲 王龙梅 李萍

361003 厦门市妇幼保健院

通信作者: 李萍, Tel: +86-18046427900, Fax: +86-592-2662032, Email: saarc2001@sina.com

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**【摘要】**目的 探讨激素替代 (HRT) 周期中冻融囊胚体外培养时间对妊娠结局的影响, 优化囊胚移植策略。方法 通过回顾性队列研究分析本中心 796 例冻融囊胚移植周期的资料, 根据解冻后不同的培养时间分为 2~4 h(A 组,  $n=422$ ) 和 4~8 h(B 组,  $n=374$ ) 2 组, 对其妊娠结局进行比较。结果 B 组种植率 (58.7%) 和临床妊娠率 (72.2%) 高于 A 组 (50.5%, 62.6%), 差异有统计学意义 ( $P=0.003$ ,  $P=0.004$ )。B 组的早期流产率 (10.0%) 低于 A 组 (16.7%,  $P=0.025$ )。组间异位妊娠率和多胎率的差异均无统计学意义 ( $P>0.05$ )。结论 在 HRT 周期中, 适当延长冻融囊胚的体外培养时间能够改善妊娠结局。

**【关键词】**激素替代 (HRT) 周期; 冻融囊胚移植 (FBT); 妊娠结局

**基金项目:** 福建省科技计划项目 (2015D018)

**Impact of incubation time on pregnancy outcome of frozen-thawed blastocysts in hormone replacement therapy cycle** Qiu Pingping, Wang Ye, Lin Jin, Ji Hong, Zhang Ling, Wang Longmei, Li Ping

Xiamen Maternity and Child Health Care Hospital, Xiamen 361003, China (Qiu PP, Wang Y, Lin J, Ji H, Zhang L, Wang LM, Li P)

Corresponding author: Li Ping, Tel: +86-18046427900, Fax: +86-592-2662032, Email: saarc2001@sina.com

**【Abstract】 Objective** To investigate the impact of incubation time on pregnancy outcome of frozen-thawed blastocysts in hormone replacement therapy (HRT) cycle and to optimize the strategy of blastocyst transplantation. **Methods** It is a retrospective cohort study, we analyzed the clinical data of 796 cases of frozen-thawed blastocysts. The cycles were divided into two groups according to the incubation time: 2-4 h group (group A,  $n=422$ ) and 4-8 h group (group B,  $n=374$ ). The pregnancy outcome between the two groups were compared. **Results** Group B had higher implantation rate (58.7%) and clinical pregnancy rate (72.2%) than group A (50.5%, 62.6%), the differences were statistically significant ( $P=0.003$ ,  $P=0.004$ ). The early abortion rate of group B (10.0%) was lower than that of group A (16.7%,  $P=0.025$ ). There was no significant difference in ectopic pregnancy rate and multiple pregnancy rate between the two groups ( $P>0.05$ ). **Conclusion** In the HRT cycle, proper extending the incubation time of frozen-thawed blastocysts can improve pregnancy outcomes.

**【Key words】** Hormone replacement therapy (HRT) cycles; Frozen-thawed blastocysts transfer; Pregnancy outcomes

**Fund program:** Fujian Science and Technology Project (2015D018)

## 金凤丸在中重度宫腔粘连患者中的疗效分析

王玲玲 邱慧玲

361003 厦门, 中国人民解放军第一七四医院妇科

通信作者: 邱慧玲, Tel: +86-13906056198, Email: 23966436@qq.com

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**【摘要】目的** 研究金凤丸对中重度宫腔粘连患者的临床疗效。**方法** 回顾性队列研究分析 2017 年 1—6 月期间在本院妇科经宫腔镜检查、按美国生育学会 (AFS) 评分标准诊断为中重度宫腔粘连病例 102 例, 其中对照组 50 例、试验组 52 例, 所有患者均在宫腔镜下行宫腔粘连分离术后放置子宫支架, 同时补充芬吗通 1 个月, 试验组加服用金凤丸, 监测用药前后内膜厚度、用药期间不良反应, 随访 1 个月后月经量恢复情况及行宫腔镜二次探查术了解宫腔恢复情况。**结果** 对照组治疗后月经改善率为 70%, 而试验组达到 88.46%, 高于对照组 ( $P=0.021$ ), 两组治疗后内膜厚度均较治疗前显著增加 ( $P<0.01$ ), 对照组增至  $(6.21\pm 0.55)$  mm, 试验组增至  $(6.62\pm 0.68)$  mm, 试验组较对照组增厚更明显 ( $P=0.001$ ), 但在宫腔镜下宫腔恢复有效性方面, 试验组略高于对照组, 但其差异无统计学意义 ( $P=0.541$ )。**结论** 金凤丸可改善中重度宫腔粘连患者术后月经量的情况, 增加子宫内膜厚度, 但对宫腔恢复有效性方面及远期的妊娠率需进一步追踪及研究。

**【关键词】** 宫腔粘连; 金凤丸; 芬吗通

**基金项目:** 厦门市科技计划项目 (3502Z20154044)

· 临床报道 ·

**Effect analysis of Jinfeng pill on moderate and severe intrauterine adhesions** Wang Lingling, Qiu Huiling  
Department of Gynaecology, No. 174 Hospital of PLA, Xiamen 361003, China (Wang LL, Qiu HL)

Corresponding author: Qiu Huiling, Tel: +86-13906056198, Email: 23966436@qq.com

**【Abstract】 Objective** To investigate the clinical efficacy of Jinfeng pill for the treatment of moderate and severe intrauterine adhesions. **Methods** The retrospective cohort study included 102 patients receiving hysteroscopy and diagnosed as moderate to severe intrauterine adhesion according to American Fertility Society (AFS) grading criteria between January 2017 and June 2017. All patients received a surgical separation for intrauterine adhesion followed by a uterus stent placement under hysteroscopy, and were supplemented with the Femoston for 1 month. The experimental group was also supplemented with Jinfeng pill ( $n=52$ ) whereas control group ( $n=50$ ) received routine treatment only. The endometrial thickness and the menstrual volume before and 1 month after treatment were recorded. Adverse effects of the treatment were monitored. A second hysteroscopy was scheduled 1 month postoperatively to evaluate the recovery of uterine. **Results** No significant difference in age, gravidity, history of intrauterine operation and preoperative endometrial thickness was detected between groups. About 70% of the patients in control group and 88.46% of experimental group had an improvement in menstrual volume. The difference between the two groups was significant ( $P=0.021$ ). The endometrial thickness in both groups was significantly increased after treatment ( $P<0.01$ ). The endometrial thickness after treatment was higher in experimental group [ $(6.62 \pm 0.68)$  mm] than in control group [ $(6.21 \pm 0.55)$  mm,  $P=0.001$ ]. The uterine recovery under hysteroscopy was prone to be higher in experimental group, but the difference did not reach statistical significant ( $P=0.541$ ). **Conclusion** Jinfeng pill can improve postoperative menstrual volume and endometrial thickness in patients with moderate to severe intrauterine adhesions, but the effects on uterine recovery and pregnancy rate in future require further study.

**【Key words】** Intrauterine adhesions; Jinfeng pill; Femoston

**Fund program:** Xiamen Science and Technology Project (3502Z20154044)



## 辅助生殖后宫内双胎合并卵巢妊娠 1 例

陈琼 刘艳云 卢晓声 赵军招 屈王蕾 陈一喆

325000 温州医科大学附属第二医院, 育英儿童医院

通信作者: 陈一喆, Tel: +86-577-88002210, Email: cyz943008@126.com

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**【摘要】**目的 探讨辅助生殖技术应用后复合妊娠发生的高危因素及降低发生率的措施。方法 对 1 例胚胎移植术后宫内双胎妊娠合并卵巢妊娠病例的诊断及治疗过程进行报道并对相关病例资料进行回顾分析。结果 盆腔炎后遗症患者, 移植了 2 枚第 4 日新鲜胚胎后出现急腹症, 经超声检查及手术证实为宫内双胎合并卵巢妊娠。结论 提倡选择性单囊胚移植, 减少复合妊娠的发生率。

**【关键词】**辅助生殖; 宫内双胎; 卵巢妊娠

**Intrauterine twin pregnancy combined with ovary pregnancy after assisted reproduction: a case report**

Chen Qiong, Liu Yanyun, Lu Xiaosheng, Zhao Junzhao, Qu Wanglei, Chen Yizhe

The Second Affiliated Hospital and Yuying Children's Hospital of Wenzhou Medical University, Wenzhou 325000, China (Chen Q, Liu YY, Lu XS, Zhao JZ, Qu WL, Chen YZ)

Corresponding author: Chen Yizhe, Tel: +86-577-88002210, Email: cyz943008@126.com

**【Abstract】 Objective** To explore the risk factors and reduce the incidence of compound pregnancy after application of assisted reproductive technology. **Methods** We reported and reviewed the diagnosis and treatment of a patient carrying intrauterine twin pregnancy combined with ovary pregnancy after embryo transplantation. **Results** The patient with sequelae of pelvic inflammatory disease occurred acute abdomen after transplanted with two day-4 fresh embryos. Intrauterine twins combined with ovarian pregnancy was confirmed by ultrasonography and operation. **Conclusion** Single blastocyst transfer is advocated to reduce the incidence of compound pregnancy.

**【Key words】** Assisted reproduction; Intrauterine twin pregnancy; Ovary pregnancy

## 人类免疫缺陷病毒感染行辅助生殖助孕策略及研究进展

欧阳璐 王恩银 孙莹璞

450052 郑州大学第一附属医院生殖医学中心, 河南省生殖与遗传病重点实验室

通信作者: 孙莹璞, Tel: +86-371-66913635, Email: syp2008@vip.sina.com

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**【摘要】** 获得性免疫缺陷综合征 (acquired immunodeficiency syndrome, AIDS) 是由人类免疫缺陷病毒 (human immunodeficiency virus, HIV) 感染所引起的一种严重威胁人类健康的传染性疾病。高效抗逆转录病毒治疗 (highly active antiretroviral therapy, HAART) 的有效实施, 使病毒复制减少, 母婴传播风险降低, HIV 感染者生活质量明显改善, 预期寿命得以延长。因此, 越来越多 HIV 感染者将生育计划纳入考虑范畴。辅助生殖技术 (assisted reproductive technology, ART) 及合理的分娩方式可有效降低伴侣及子代传播风险, 同时增加受孕率, 使得 HIV 感染者对 ART 的需求上升。本文从 HIV 感染及抗病毒治疗对生育力的影响、HIV 感染者 ART 助孕策略、预防 HIV 母婴传播的产科管理和抗病毒措施、ART 治疗伦理及实验室管理等方面进行阐述。

**【关键词】** 人类免疫缺陷病毒 (HIV); 辅助生殖技术 (ART); 伦理

**Strategies and research progress of assisted reproductive technology in human immunodeficiency virus infected patients** Ouyang Lu, Wang Enyin, Sun Yingpu

*The Reproductive Medicine of Center of the First Affiliated Hospital of Zhengzhou University, Henan Key Laboratory of Reproduction and Genetics, Zhengzhou 450052, China (Ouyang L, Wang EY, Sun YP)*

*Corresponding author: Sun Yingpu, Tel: +86-371-66913635, Email: syp2008@vip.sina.com*

**【Abstract】** Acquired immunodeficiency syndrome (AIDS) is a severe infectious disease caused by human immunodeficiency virus (HIV) infection, which is a serious threat to human health. The effective implementation of highly active antiretroviral therapy (HAART) has reduced virus replication, decreased the risk of mother-to-child transmission, significantly improved the quality of life of HIV-infected individuals and extended their life expectancy. Therefore, more and more HIV-infected people take fertility into account. As to partners and offspring, assisted reproductive technology (ART) and reasonable delivery methods can effectively reduce the risk of transmission and improve the rate of conception, so there is an increasing demand for ART among HIV-infected individuals. The purpose of this article is to summarize the research progress in impact of HIV infection and antiviral treatment on fertility, ART assisted pregnancy strategies for HIV-infected patients, obstetric management and anti-viral measures to prevent mother-to-child transmission of HIV, laboratory management and related ethical problems.

**【Key words】** Human immunodeficiency virus (HIV); Assisted reproductive technology (ART); Ethics

## 控制性超促排卵过程中评估卵巢敏感性的新指标

邢阿英 王大琳 耿蒙慧 张璨 胡艳秋

116044 大连医科大学(邢阿英、耿蒙慧、张璨); 225001 扬州大学医学院(王大琳);

225009 扬州, 江苏省苏北人民医院生殖中心(胡艳秋)

通信作者: 胡艳秋, Tel: +86-18051060567, Fax: +86-514-89790080,

Email: huyanqiu78@163.com

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**【摘要】** 控制性超促排卵 (COH) 是对辅助生殖技术结局有重要作用的一项步骤, 如何准确评估及预测 COH 过程中卵巢的反应性是制定个体化 COH 方案的重要课题之一。以往的研究提出了许多指标来评价或预测患者卵巢的反应情况, 但这些指标都存在一定的局限性。近几年有学者提出了卵泡输出率 (follicular output rate, FORT)、卵巢敏感指数 (ovarian sensitivity index, OSI) 及卵泡敏感指数 (follicular sensitivity index, FSI) 等新的评价指标来更好地评估卵巢反应性。本文通过总结相关文献, 将 COH 过程中 FORT、OSI 及 FSI 对卵巢敏感性的评估及预测作用进行综述。

**【关键词】** 卵巢反应性; 卵泡输出率 (FORT); 卵巢敏感指数 (OSI); 卵泡敏感指数 (FSI)

**基金项目:** 江苏省青年医学人才 (QNRC2016347)

**New indexes for evaluating ovarian sensitivity during controlled ovulation** Xing Aying, Wang Dalin, Geng Menghui, Zhang Can, Hu Yanqiu

Dalian Medical University, Dalian 116044, China (Xing AY, Geng MH, Zhang C); Medical College of Yangzhou University, Yangzhou 225001, China (Wang DL); Department of Reproductive Medicine of the Northern Jiangsu People's Hospital, Yangzhou 225009, China (Hu YQ)

Corresponding author: Hu Yanqiu, Tel: +86-18051060567, Fax: +86-514-89790080, Email: huyanqiu78@163.com

**【Abstract】** Controlled ovulation hyperstimulation (COH) is one of the important steps in assisted reproductive technology which plays an important role in the outcome. How to accurately evaluate and predict the ovarian response in COH is one of the most important topics in the development of individual COH regimens. Previous studies have proposed a number of indicators to evaluate or predict ovarian response in patients, but these indicators have some limitations. In recent years, some scholars have proposed new evaluation indexes such as follicular output rate (FORT), ovarian sensitivity index (OSI) and follicular sensitivity index (FSI) to better evaluate ovarian reactivity. This article summarizes the relevant literature to review the role of FORT, OSI and FSI in evaluating and predicting ovarian sensitivity during COH.

**【Key words】** Ovarian response; Follicular output rate (FORT); Ovarian sensitivity index (OSI); Follicle sensitivity index (FSI)

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## 纺锤体观测参数与卵胞质内单精子显微注射结局关系的研究进展

陈亚宁 黄亚

200131 上海永远幸妇科医院

通信作者: 黄亚, Tel: +86-18964102996, Email: sh\_huangya@sina.com

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**【摘要】** 在细胞分裂过程中, 纺锤体对卵母细胞染色体的运动、平衡、分配和极体的排出十分重要。随着偏振光显微镜的发展, 在活细胞中观察纺锤体已经十分方便, 这也为研究纺锤体不同观测参数对卵胞质内单精子显微注射 (ICSI) 后卵母细胞受精和胚胎发育的影响创造了有利条件。本文对卵母细胞纺锤体不同观测参数包括有无纺锤体、纺锤体的形态、光阻滞值、纺锤体与第一极体的夹角、纺锤体与 ICSI 注射针的相对位置等对 ICSI 结局的影响进行综述。

**【关键词】** 纺锤体; 第一极体; 卵胞质内单精子显微注射 (ICSI); 受精; 胚胎发育

**基金项目:** 上海市卫生和计划生育委员会面上项目 (201740157)

**Research progress on the relationship between spindle observation parameters and intracytoplasmic sperm injection outcome**    *Chen Yaning, Huang Ya*

*Shanghai TOWAKO Hospital, Shanghai 200131, China (Chen YN, Huang Y)*

*Corresponding author: Huang Ya, Tel: +86-18964102996, Email: sh\_huangya@sina.com*

**【Abstract】** In the process of cell division, the spindle plays an important role in chromosome movement, balance, distribution and polar body extrusion in oocytes. With the development of polarization microscopy (PolScope), observations of spindle in living oocytes have been very convenient. This also provides favorable conditions for studying the effect of spindle on the oocyte fertilization and embryonic development potential after intracytoplasmic sperm injection (ICSI). This paper reviews the effect of different observation parameters of spindle including with or without spindle, spindle morphology, spindle retardance value, spindle angle and the position of spindle in relation to the injection site on the outcomes of ICSI.

**【Key words】** Spindle; First polar body; Intracytoplasmic sperm injection (ICSI); Fertilization; Embryonic development

**Fund program:** Surface Program of Shanghai Health and Family Planning Commission (201740157)



## 子宫内膜蜕膜化的研究进展

高玥 王雅琴 杨菁

430060 武汉大学人民医院生殖医学中心, 湖北省辅助生殖与胚胎发育医学临床研究中心

通信作者: 杨菁, Tel: +86-13507182023, Email: 13507182023@163.com

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**【摘要】** 妊娠是一个复杂的生理过程, 胎儿在母体内的正常发育是一个在细胞与分子水平上受到严密调控的过程。早期妊娠阶段, 子宫内膜基质细胞转变为分泌型蜕膜细胞, 为早期妊娠的维持和胎盘形成提供重要的营养物质和免疫环境, 这个过程就是蜕膜化。在甾体激素的精确调节下, 子宫内膜基质细胞体积增大并快速增殖、小血管生成, 同时各类分子也呈现出时间-空间性表达, 在蜕膜化过程中发挥它们的独特作用。为了更全面地了解子宫内膜蜕膜化, 并探讨早期妊娠失败的潜在原因, 本文对蜕膜化的形成及相关调控分子做一综述, 以期对未来妊娠相关疾病提供更多的理论依据。

**【关键词】** 子宫内膜; 蜕膜化; 子宫内膜基质细胞; 植入

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**Research progress on endometrium decidualization** Gao Yue, Wang Yaqin, Yang Jing

*Reproductive Medical Center, Renmin Hospital, Wuhan University, Hubei Clinic Research Center for Assisted Reproductive Technology and Embryonic Development, Wuhan 430060, China (Gao Y, Wang YQ, Yang J)*

*Corresponding author: Yang Jing, Tel: +86-13507182023, Email: 13507182023@163.com*

**【Abstract】** Pregnancy is a complex physiological process, and the development of fetus in maternal body is accurately regulated at the cellular and molecular level. During pregnancy, the endometrial stromal cells transform into specialized secretory decidual cells termed as decidualization, to provide a nutritive and immune privileged matrix essential for embryo implantation and placental development. During this process, a series of dynamic developmental events, including rapid stromal proliferation, increased stromal cell size, enhanced angiogenesis, took place in a highly ordered manner under the precise regulation of steroid hormones. Meanwhile, diverse molecules exhibit spatiotemporal specific expression pattern, implying their unique roles in decidual development. To achieve a more comprehensive understanding of these biological events and explore the underlying causes of early pregnancy disorders, this review emphasizes on the detailed developmental progression of decidual transformation and related molecules, to provide more theoretical basis on pregnancy-related diseases.

**【Key words】** Endometrium; Decidualization; Endometrial stromal cells; Implantation

**Fund program:** National Natural Science Foundation of China (81501253, 81571513); National Key Research and Development Program of China (2016YFC1000600, 2018YFC1002804)

## 脂肪组织和脂肪因子与子宫内膜异位症关系的研究进展

李梦云 李妍 张慧玲

110004 沈阳, 中国医科大学附属盛京医院

通信作者: 李妍, Tel: +86-18940254799, Email: leeyan8888@qq.com

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**【摘要】** 脂肪组织不仅具有能量储存、保暖等功能, 作为人体最大的内分泌器官, 还可以通过分泌瘦素、脂联素等多种脂肪因子、细胞间黏附分子-1(ICAM-1)等黏附分子及血管内皮生长因子(VEGF)等血管生成因子参与人体免疫、炎症、脂类代谢、血管生成等。子宫内膜异位症(EMS)患者体质指数(BMI)、血清及腹腔中瘦素、抵抗素、脂联素等多种脂肪因子浓度、黏附分子及血管生成因子浓度与非EMS患者间存在明显差异, 这可能是脂肪组织及脂肪因子通过促炎、促进血管生成、产生胰岛素抵抗(IR)等作用促进异位子宫内膜的黏附、侵袭以及血管形成。现就脂肪组织及其分泌的脂肪因子、黏附分子及血管生成因子在EMS发生、发展中的作用进行综述。

**【关键词】** 子宫内膜异位症(EMS); 脂肪组织; 脂肪因子

**基金项目:** 辽宁省自然科学基金(2015020530); 辽宁省临床能力建设项目(LXCCD-D11-2015)

**Research progress on the relationship between adipose tissue and adipokines and endometriosis** *Li Mengyun,*

*Li Yan, Zhang Huiling*

*Shengjing Hospital Affiliated to China Medical University, Shenyang 110000, China (Li MY, Li Y, Zhang HL)*

*Corresponding author: Li Yan, Tel: +86-18940254799, Email: leeyan8888@qq.com*

**【Abstract】** Adipose tissue not only has the function of energy storage and heat preservation, as the largest endocrine organ in human body, can also be involved in the human body immunity, inflammation, lipid metabolism, angiogenesis and so on, through the secretion of leptin, adiponectin and other adipokines, adhesion molecule such as intercellular cell adhesion molecule-1 (ICAM-1), and angiogenic factors such as vascular endothelial growth factor (VEGF). Body mass index (BMI), serum or intraperitoneal leptin, resistin, adiponectin concentrations, such as adhesion molecules and angiogenesis factors between endometriosis (EMS) patients and women without EMS were significant differences. It may be that adipose tissue and adipose factors promote adhesion, invasion and angiogenesis of ectopic endometrium by promoting inflammation, promoting angiogenesis, and producing insulin resistance. The role of adipose tissue and its secreted adipokines, adhesion molecules and angiogenesis factors in the development of EMS are reviewed.

**【Key words】** Endometriosis (EMS); Adipose tissue; Adipokines

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