

# 中华生殖与避孕杂志

原刊名《生殖与避孕》



CHINESE JOURNAL OF REPRODUCTION AND CONTRACEPTION

月刊 1980年12月创刊 第37卷 第3期 2017年3月25日出版

## 主 管

中国科学技术协会

## 主 办

中华医学会  
上海市计划生育科学研究所  
复旦大学附属妇产科医院

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## 出 版

《中华医学杂志》社有限责任公司  
100710,北京市东直门大街42号  
电话(传真): 010-85158180  
Email: office@cma.org.cn

## 广告经营许可证

3100420100002

## 印 刷

上海出版印刷有限公司

## 发 行

范围: 公开  
国内: 中国邮政集团公司  
上海分公司  
国外: 中国国际图书贸易集团  
责任有限公司  
(北京399信箱, 100044)  
代号: M389

## 订 购

全国各地邮政局  
邮发代号: 4-928

## 邮 购

中华生殖与避孕杂志编辑部  
200237, 上海市老沪闵路779号  
电话: 021-64438168, 64438975  
Email: randc@sippr.org.cn

## 定 价

每期20.00元, 全年240.00元

## 中国标准连续出版物号

ISSN 2096-2916  
CN 10-1441/R

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本期责任编辑 乔杰

本期责任编辑 王李艳

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# CHINESE JOURNAL OF REPRODUCTION AND CONTRACEPTION

(Original title: *Reproduction and Contraception*)



Monthly Established in December 1980 Volume 37, Number 3 March 25, 2017

## Responsible Institution

China Association for Science and Technology

## Sponsor

Chinese Medical Association, Shanghai  
Institute of Planned Parenthood Research,  
Gynecological and Obstetrical Hospital  
of Fudan University

## Editing

Editorial Board of Chinese Journal of  
Reproduction and Contraception

779 Laohumin Road, Shanghai 200237, China  
Tel: 0086-21-64438169  
Fax: 0086-21-64438975  
<http://zhshzybyzz.yiigle.com>  
<http://www.medline.org.cn>

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## Publishing

Chinese Medical Journal  
Publishing House Co., Ltd

42 Dongsi Xidajie, Beijing 100710, China  
Tel(Fax):0086-10-85158180  
Email: [office@ema.org.cn](mailto:office@ema.org.cn)

## Printing

Shanghai Publishing Printing Co., Ltd.

## Overseas Distributor

China International Book  
Trading Corporation  
P.O.Box 339, Beijing 100044  
China code No. M389

## Mail-Order

Editorial Board of Chinese Journal of  
Reproduction and Contraception

779 Laohumin Road, Shanghai 200237, China  
Tel: 0086-21-64438169  
Fax: 0086-21-64438975  
Email: [randc@sippr.org.cn](mailto:randc@sippr.org.cn)

## CSSN

ISSN 2096-2916  
CN 10-1441/R

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· 临床研究 ·

# 获卵数目对有效胚胎形成率的影响: 2 578 个体外受精周期分析

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DOI: 10.3760/cma.j.issn.2096-2916.2017.03.001

**【摘要】目的** 探讨体外受精 / 卵胞质内单精子注射 - 胚胎移植(IVF/ICSI-ET)中影响可用胚胎率的主要因素。**方法** 回顾性分析行 IVF/ICSI-ET 治疗的 2 578 个周期共 24 772 枚卵母细胞。按获卵数将其分为 A 组(1~5)、B 组(6~10)、C 组(11~15)、D 组(16~20)、E 组(>20), 比较各组的受精率、卵裂率、M<sub>II</sub> 卵率、有效胚胎形成数(率)、妊娠率及胚胎种植率等。采用多因素线性回归分析筛选出影响受精率、卵裂率、卵子成熟率以及可用胚胎数(率)的独立相关因素, 同时排除单因素分析中出现的混杂。**结果** 单因素分析各组卵子成熟卵率有差异, 但没有看到趋势性变化; IVF 受精率在各组间有统计学差异, 而 ICSI 受精率各组间无统计学差异。卵裂率各组间无统计学差异, 可用胚胎数以及冷冻胚胎数 A~E 组依次增加, 而可用胚胎率随着获卵数的增加却逐渐降低(44.6%、36.0%、33.5%、29.4%、28.8%,  $P=0.00$ )。多因素分析提示取卵数的标准化回归系数的绝对值最大( $B=-0.205$ ,  $P=0.00$ ),  $t$  的绝对值也最大( $t=-8.299$ ), 表明取卵数对可用胚胎率的影响最大, 提示取卵数越多, 可用胚胎率越低。而卵子数目对卵子成熟率、受精率以及卵裂率没有影响。**结论** 随着取卵数的增多, 虽然可用胚胎数是增加的, 但可用胚胎的转化率却降低了。今后的促排卵目标不是产生的卵子越多越好, 而是采用合适的方案尽量减少对卵巢的过度刺激, 获得一定数量的正常卵子并形成优质的可供移植的胚胎。

**【关键词】** 获卵数; 有效胚胎形成率; 控制性超促排卵(COH); 卵子利用率

**基金项目:** 卫生计生委公益项目(201402004)

## · 临床研究 ·

### Effect of the number of oocyte retrieved on the formation rate of transferable embryos in *in vitro* fertilization treatment: an analysis of 2 578 treatment cycles

Pan Jiaping, Teng Xiaoming, Wang Yu, Wu Haixia, Liang Shanshan, Wu Ye, Ruan Jingling, Huang Meiyuan, Chen Zhiqin

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**【Abstract】 Objective** To identify the the major impact factor on the transferable embryos formation in *in vitro* fertilization/intracytoplasmic sperm injection-embryo transfer (IVF/ICSI-ET) cycles. **Methods** A large retrospective cohort study ( $n=2\,578$ ) was performed. Patients performing IVF/ICSI-ET were reviewed, and were categorized into five groups according to the number of oocytes retrieved (1–5 oocytes in group A, 6–10 oocytes in group B, 11–15 oocytes in group C, 16–20 oocytes in group D, >20 oocytes in group E). Oocyte maturity, fertilization rate as well as embryo cleavage rate and transferable embryos formation rate were compared among the five groups. Multivariate liner regression analysis was performed to assess the association between oocyte number and transferable embryos formation rate after adjusting for confounding factors that were identified in the univariate analysis. **Results** There were significant differences in the oocyte maturity rate, fertilization rate after IVF, no difference was found in fertilization rate after ICSI and embryo cleavage rate among the groups. Transferable embryo formation rate gradually decreased with the increasing number of retrieved oocytes (44.6%, 36.0%, 33.5%, 29.4%, 28.8%,  $P=0.00$ ). Both univariate and multivariate analysis found that oocyte number was positively associated with number of transferable embryos, but were negatively associated with transferable embryos formation rate. Oocyte number was the dominant factor affect on transferable embryos formation ( $B=-0.205$ ,  $t=-8.299$ ,  $P=0.00$ ). **Conclusion** The number of transferable embryos increases with oocyte yield, but the proportion of transferable embryos formation declines. Future ovarian stimulation should not focus on obtaining as many oocytes as possible. Strategies should aim at less interference with ovarian physiology, and facilitating selection of the best quality embryo for transfer.

**【Key words】** Oocyte number; Transferable embryo formation rate; Oocyte maturity; Fertilization rate; Controlled ovarian hyperstimulation (COH)

**Fund program:** Public Welfare Project of National Health and Family Planning Commission (201402004)

· 临床研究 ·

# 薄型子宫内膜新鲜胚胎和冻融胚胎移植妊娠结局比较

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DOI: 10.3760/cma.j.issn.2096-2916.2017.03.002

**【摘要】目的** 探讨在薄型子宫内膜患者中新鲜胚胎移植与冻融胚胎移植(FET)妊娠结局的差异。**方法** 回顾性分析接受体外受精/卵胞质内单精子显微注射-胚胎移植(IVF/ICSI-ET)治疗采用长方案胚胎移植hCG注射日与冻融周期胚胎移植内膜转化日的内膜厚度 $\leq 7$  mm的患者共592个周期的临床资料。将移植周期按胚胎是否冻融分为新鲜胚胎移植组( $n=173$ )和FET组( $n=419$ )。比较组间的胚胎种植率、临床妊娠率、流产率、多胎率和异位妊娠率有无差异。**结果** 新鲜胚胎移植组患者平均移植胚胎( $2.1 \pm 0.4$ )枚,与FET组患者平均移植胚胎( $2.1 \pm 0.5$ )枚比较,组间有统计学差异( $P<0.05$ );按照移植胚胎数分为3个亚组,新鲜胚胎移植组1枚胚胎者,妊娠率为7.7%,2枚者为30.2%,3枚者为23.8%;FET组1枚胚胎者15.6%,2枚者为34.9%,3枚者为41.6%,新鲜胚胎移植组与FET组间差异均无统计学意义( $P>0.05$ )。组间着床率、流产率、异位妊娠率等结果也均无统计学差异( $P>0.05$ )。移植3枚胚胎新鲜组多胎率(80.0%)高于FET组(29.7%)( $P<0.05$ )。新鲜胚胎移植组多胎率3个亚组间有统计学差异( $P<0.05$ ),FET组妊娠率和流产率3个亚组间均有统计学差异( $P<0.05$ )。将移植胚胎数作为协变量,纳入Logistics回归模型对结果变量进行分析,说明周期类型与临床妊娠率间无显著相关性( $OR=0.726$ , 95%  $CI=0.504\sim 1.104$ )。**结论** 子宫内膜厚度 $\leq 7$  mm的薄型内膜患者新鲜胚胎移植和FET妊娠结局相似,选择新鲜周期移植不影响妊娠结局并可缩短治疗周期,降低总费用。

**【关键词】** 薄型子宫内膜; 新鲜胚胎移植; 移植胚胎数; 妊娠率

· 临床研究 ·

**Comparison of pregnancy outcome in patients with thin endometrium undergoing fresh embryos and frozen thawed embryo transfer** Zhang Qihua, Xing Jingjing, Sun Jing, Su Yingchun

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**【Abstract】Objective** To study the differences of pregnancy outcome in patients with thin endometrium undergoing fresh embryo transfer and frozen-thawed embryo transfer (FET). **Methods** Retrospective analysis was performed in patients with the endometrial thickness  $\leq 7$  mm on hCG injection day and FET endometrial transformation day who received *in vitro* fertilization/intracytoplasmic sperm injection-embryo transfer (IVF/ICSI-ET) treatment, including 592 cycles of clinical data. According to transplanted embryos whether or not be frozen-thawed, all patients were divided into two groups: fresh embryo transfer group (173 cases), FET group (419 cases). The rates of embryo implantation, clinical pregnancy rate, spontaneous abortion rate, multiple birth rate and ectopic pregnancy rate were compared between the two groups. **Results** The number of embryos transferred in fresh embryo transfer group was  $2.1 \pm 0.4$  and FET group was  $2.1 \pm 0.5$  ( $P < 0.05$ ). According to the number of embryos transferred 1, 2, 3 were divided into 3 subgroups, the pregnancy rate between the three groups (one embryo: 7.7% and 15.6%, two embryos: 30.2% and 34.9%, three embryos: 23.8% and 41.6%), the difference was not statistically significant. There were no significant differences in spontaneous abortion rate and ectopic pregnancy rates among the two groups ( $P > 0.05$ ). The rate of multiple births in the fresh group of 3 embryos (80.0%) was higher than that in the FET group (29.7%,  $P < 0.05$ ). In the transplantation group, fresh embryos of different multiple fetal rate differences ( $P < 0.05$ ), FET group of different number of transferred embryos on pregnancy rate and abortion rate differed ( $P < 0.05$ ). The number of transplanted embryos were used as covariates, and the results were analyzed by Logistics regression model. There was no significant correlation between cycle type and clinical pregnancy rate ( $OR = 0.726$ , 95%  $CI = 0.504 - 1.104$ ). **Conclusion** The pregnancy outcomes are similar in patients with endometrial thickness  $\leq 7$  mm between fresh embryo transfer group and FET group. Choosing fresh embryo transfer cycles does not affect the outcome of pregnancy, can shorten the treatment cycle, and reduce the total cost.

**【Key words】** Thin endometrium; Fresh embryo transplantation; Embryo transfer number; Number of transferred embryos; Pregnancy rate

· 临床研究 ·

# 高龄患者冻融胚胎移植中不同黄体支持方案对妊娠结局的影响

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DOI: 10.3760/cma.j.issn.2096-2916.2017.03.003

**【摘要】目的** 探讨不同黄体支持方案对高龄助孕患者行激素替代周期冻融胚胎移植(hormone replacement therapy-frozen-thawed embryo transfer, HRT-FET)时妊娠结局的影响。**方法** 收集 2011.01–2015.12 期间行 HRT-FET 移植且年龄  $\geq 35$  岁患者的临床资料进行回顾性分析。依据内膜转化日不同黄体支持方案, 分为黄体酮针组(A组,  $n=588$ ), 雪诺同组(B组,  $n=224$ ), 所有患者均口服地屈孕酮片(20 mg/d)。比较组间临床妊娠率、着床率、流产率、宫外孕率及活产率之间的差异。**结果** 临床及实验室一般资料组间无统计学差异( $P>0.05$ ), A 组临床妊娠率(36.6%)及着床率(20.3%)较 B 组(27.2% 和 15.1%)高, 差异有统计学意义( $P<0.05$ )。单因素及多因素 Logistic 回归分析显示, 早期流产率组间差异有统计学意义( $P<0.05$ )。**结论** 在高龄患者 HRT-FET 中, 2 种黄体支持方案妊娠结局相似, 患者可根据个人经济情况选择。

**【关键词】** 黄体支持; 冻融胚胎移植(FET); 高龄; 妊娠结局

· 临床研究 ·

**Effect of different luteal support schemes on pregnancy outcome during frozen-thawed embryo transfer in elderly patients**

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**【Abstract】 Objective** To compare the difference of pregnancy outcome between the intramuscular progesterone (IMP) and vaginal gel (Crinone 8%) in advanced maternal age with hormone replacement therapy-frozen-thawed embryo transfer (HRT-FET). **Methods** A retrospective cohort study was performed in the patients aged 35 years or older with HRT-FET during January 2011 to December 2015. Based on the different luteal support schemes on the endometrium transformation day, they were divided into two groups, group A with IMP ( $n=588$ ) and group B with Crinone 8% ( $n=224$ ), and all the patients in the two groups were given 20 mg dydrogesterone tablets daily. The basic characteristics were compared and the difference of the thawing recovery success rate, clinical pregnancy rate, embryo implantation rate, abortion rate, ectopic pregnancy rate and live birth rate were analyzed between the two groups. **Results** Clinical and laboratory data between the two groups had no significant difference ( $P>0.05$ ). Group A had higher clinical pregnancy rate (36.6%) and embryo implantation rate (20.3%) than group B (27.2% and 15.1%) ( $P<0.05$ ). Single factor and multiple factors Logistic regression analysis showed that early abortion rate had significant difference between the two groups ( $P<0.05$ ). **Conclusion** In elderly patients with HRT-FET, the two groups had the similar pregnancy outcome. People could select any one based on their personal.

**【Key words】** Luteal phase support; Frozen-thawed embryo transfer (FET); Advanced maternal age; Pregnancy outcome



· 临床研究 ·

# 血管内皮生长因子与抑制素 B 和促排卵结局的相关研究

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DOI: 10.3760/cma.j.issn.2096-2916.2017.03.004

**【摘要】目的** 探讨不同控制性超促排卵(controlled ovarian hyperstimulation, COH)方案中血清及卵泡液(follicular fluid, FF)中血管内皮生长因子(vascular endothelial growth factor, VEGF)与抑制素 B(inhibin B, INHB)及 COH 结局的相关性。**方法** 应用酶联免疫吸附方法分别检测长方案组(A 组,  $n=38$ )及非降调节方案组(B 组,  $n=38$ )患者血清及 FF 中 VEGF 和 INHB 水平并行相关性分析。**结果** ①降调节足够长时间( $\geq 18$  d)时, 血清 VEGF 水平显著下降, 且促性腺激素(Gn)启动日 A 组 VEGF 水平 $[(81.50 \pm 32.59) \text{ ng/L}]$ 明显低于 B 组 $[(123.64 \pm 53.90) \text{ ng/L}]$ ( $P<0.01$ )。② Gn 启动后 A、B 组血清 VEGF 水平呈上升趋势, hCG 注射日后 A 组继续上升, 而 B 组先下降后上升; 且 hCG 注射次日 A 组 VEGF 水平 $[(165.69 \pm 38.25) \text{ ng/L}]$ 明显高于 B 组 $[(136.49 \pm 39.19) \text{ ng/L}]$ ( $P=0.002$ ); A、B 组其它时间血清 VEGF 水平无统计学差异( $P>0.05$ )。③ Gn 第 5 日血清 VEGF 水平与 COH 结局相关性最好( $P<0.01$ )。④ A、B 组 FF 中 VEGF 水平随卵泡直径增大而升高, 大、中卵泡 VEGF 水平无统计学差异( $P>0.05$ ), 但 B 组小卵泡 VEGF 水平 $[(889.86 \pm 268.95) \text{ ng/L}]$ 明显高于 A 组 $[(728.45 \pm 291.88) \text{ ng/L}]$ ( $P=0.014$ ); 且大卵泡 VEGF 水平与 COH 结局显著呈负相关。⑤ A、B 组血清及 FF 中 VEGF 水平与 INHB 呈显著负相关。**结论** COH 过程中, 血清及大、中卵泡 VEGF 水平与卵巢反应性及 COH 结局负相关, 并且可能对 INHB 分泌起抑制作用。

**【关键词】** 血管内皮生长因子(VEGF); 抑制素 B(INHB); 控制性超促排卵(COH)

**基金项目:** 2013 年全军后勤科研项目(BBJ13C001)

· 临床研究 ·

**Effects of vascular endothelial growth factor in serum and follicular fluid on inhibin B and controlled ovarian hyperstimulation outcomes** Wu Xiaohua, Liu Xiaohui, Yang Shuai

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**【Abstract】 Objective** To explore the effects of vascular endothelial growth factor (VEGF) in serum and follicular fluid (FF) during different controlled ovarian hyperstimulation (COH) protocols on inhibin B (INHB) and COH outcomes. **Methods** The expression of VEGF and INHB in the serum and FF were detected by the enzyme-linked immunosorbent assay (ELISA) in 38 patients in down-regulation protocol (group A) and 38 patients in non-pituitary down-regulation protocol (group B). Meanwhile, the correlations of VEGF with INHB and COH outcomes were analyzed. **Results** 1) The level of VEGF in serum after down-regulation for 18 d was significantly decreased, and VEGF in group A [ $(81.50 \pm 32.59)$  ng/L] on gonadotrophins (Gn) starting day was significantly lower than that in group B [ $(123.64 \pm 53.90)$  ng/L] ( $P < 0.01$ ). 2) After exogenous stimulation, VEGF levels in the two protocols were beginning to increase, and after hCG injection day, VEGF expression in group A continued to rise, but in group B, VEGF level began to decline, and then ascended. Moreover, VEGF level in group A [ $(165.69 \pm 38.25)$  ng/L] was remarkably higher on the first day after hCG injection day ( $P = 0.002$ ) than that in group B [ $(136.49 \pm 39.19)$  ng/L]. And there was no statistical difference of VEGF expression level between the two protocols on other times ( $P > 0.05$ ). 3) VEGF level on the fifth day of Gn stimulation had the strongest relationship with COH outcomes ( $P < 0.01$ ). 4) VEGF in FF was positively correlated with follicular sizes and there was no statistical difference of VEGF level in big and middle follicles ( $P > 0.05$ ). However, statistical difference was found in small follicles ( $P = 0.014$ ). What's more, VEGF level in big follicles presented strongly negative correlation with COH outcomes. 5) VEGF levels in serum and FF were dramatically negatively correlated with INHB in COH. **Conclusions** The levels of VEGF in serum, big and middle follicles are negative with ovarian response and COH outcomes, and VEGF may inhibit the secretion of INHB in COH.

**【Key words】** Vascular endothelial growth factor (VEGF); Inhibin B (INHB); Controlled ovarian hyperstimulation (COH)

**Fund program:** The program of Army Logistics Research in 2013 (BBJ13C001)

· 临床研究 ·

## 复发性流产外周 IL-10<sup>+</sup>Tim-3<sup>+</sup> T 细胞降调节

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DOI: 10.3760/cma.j.issn.2096-2916.2017.03.005

**【摘要】目的** 探讨外周血 CD3<sup>+</sup>T 细胞中 T 细胞免疫球蛋白黏蛋白-3(Tim-3)及程序性死亡因子-1(PD-1)联合细胞因子在复发性流产(RSA)中的诊断价值。**方法** 用流式细胞术检测 19 例 RSA 患者及 17 例正常早孕者外周血 CD3<sup>+</sup>T 细胞表面 Tim-3 及 PD-1 含量, 以及破细胞膜后细胞内因子干扰素(IFN)- $\gamma$ 和白介素(IL)-10 在 Tim-3<sup>+</sup>PD-1<sup>+</sup>、Tim-3<sup>-</sup>PD-1<sup>-</sup>、Tim-3<sup>-</sup>PD-1<sup>+</sup> 和 Tim-3<sup>+</sup>PD-1<sup>-</sup> 4 群细胞内的表达情况。**结果** RSA 患者 Tim-3<sup>+</sup>PD-1<sup>+</sup>T 细胞比例(0.57%  $\pm$  0.26%)明显低于早孕组(1.24%  $\pm$  0.77%)( $P < 0.001$ )。RSA 组 4 群 T 细胞中 IL-10 阳性细胞所占比例分别为 33.55%  $\pm$  16.27%、0.92%  $\pm$  0.88%、1.61%  $\pm$  1.35%、16.36%  $\pm$  13.98%; 早孕组 4 群 T 细胞中 IL-10 阳性细胞占比分别为 45.92%  $\pm$  17.89%、0.49%  $\pm$  0.27%、0.92%  $\pm$  0.68%、33.43%  $\pm$  16.98%。RSA 组和正常组 Tim-3<sup>+</sup>PD-1<sup>+</sup>T 细胞群中 IL-10 的含量均显著高于其他 3 群( $P < 0.05$ ); RSA 组 Tim-3<sup>+</sup>PD-1<sup>+</sup> 和 Tim-3<sup>+</sup>PD-1<sup>-</sup> T 细胞中 IL-10 阳性细胞含量(33.55%  $\pm$  16.27%, 16.36%  $\pm$  13.98%)显著低于正常早孕组(45.92%  $\pm$  17.89%, 33.43%  $\pm$  16.98%)( $P < 0.05$ ,  $P < 0.01$ )。而 IFN- $\gamma$  在 RSA 组和正常组 4 群细胞中的表达无统计学差异。**结论** RSA 患者 IL-10<sup>+</sup>Tim-3<sup>+</sup>T 细胞显著降低, 可作为判断 RSA 的新的参考指标。

**【关键词】** 复发性自然流产(RSA); Tim-3<sup>+</sup>PD-1<sup>+</sup>T 细胞; IL-10<sup>+</sup>Tim-3<sup>+</sup>T 细胞

**基金项目:** 上海市卫计委青年科研项目(20164Y0105)

· 临床研究 ·

**Down regulatory effect of peripheral IL-10<sup>+</sup>Tim-3<sup>+</sup>T cells in recurrent spontaneous abortion**

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**【Abstract】 Objective** To evaluate the diagnosis value of T cell immunoglobulin and mucin-3 (Tim-3) and programmed death-1 (PD-1) combined with cytokines on peripheral CD3<sup>+</sup>T cells in the patients of recurrent spontaneous abortion (RSA). **Methods** Flow cytometry was used to detect the proportion of Tim-3<sup>+</sup>PD-1<sup>+</sup>, Tim-3<sup>+</sup>PD-1<sup>-</sup>, Tim-3<sup>-</sup>PD-1<sup>+</sup> and Tim-3<sup>-</sup>PD-1<sup>-</sup> in CD3<sup>+</sup>T cells, and the expression of interferon (IFN)- $\gamma$  and interleukin (IL)-10 produced by the four parts of T cells, from 17 normal pregnant women and 19 RSA patients. **Results** Compared with normal pregnant women group ( $1.24\% \pm 0.77\%$ ), the proportion of Tim-3<sup>+</sup>PD-1<sup>+</sup>T cells in RSA group were lower significantly ( $0.57\% \pm 0.26\%$ ) ( $P < 0.001$ ). The proportions of IL-10 in four parts of T cells in RSA group were  $33.55\% \pm 16.27\%$ ,  $0.92\% \pm 0.88\%$ ,  $1.61\% \pm 1.35\%$  and  $16.36\% \pm 13.98\%$ . The proportions of IL-10 in four parts of T cells in normal pregnant group were  $45.92\% \pm 17.89\%$ ,  $0.49\% \pm 0.27\%$ ,  $0.92\% \pm 0.68\%$  and  $33.43\% \pm 16.98\%$ . The proportion of IL-10 produced by Tim-3<sup>+</sup>PD-1<sup>+</sup>T cells in two groups was higher than that in other three parts ( $P < 0.05$ ); and the proportions of IL-10 produced by Tim-3<sup>+</sup>PD-1<sup>+</sup> and Tim-3<sup>+</sup>PD-1<sup>-</sup>T cells in RSA group ( $33.55\% \pm 16.27\%$ ,  $16.36\% \pm 13.98\%$ ) were lower than those in normal pregnant group ( $45.92\% \pm 17.89\%$ ,  $33.43\% \pm 16.98\%$ ) ( $P < 0.05$ ,  $P < 0.01$ ), while the expression of IFN- $\gamma$  in four parts of two groups had no difference. **Conclusion** IL-10<sup>+</sup>Tim-3<sup>+</sup>T cells are significantly lower in RSA, which may be a new observation index for judging the RSA.

**【Key words】** Recurrent spontaneous abortion (RSA); Tim-3<sup>+</sup>PD-1<sup>+</sup>T cells; IL-10<sup>+</sup>Tim-3<sup>+</sup>T cells

**Fund program:** Research Program of Shanghai Health Bureau (20164Y0105)

· 临床研究 ·

# 缩宫素受体在子宫内膜异位症 子宫结合带中的表达

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DOI: 10.3760/cma.j.issn.2096-2916.2017.03.006

**【摘要】目的** 探讨缩宫素受体(OTR)在子宫内膜异位症(EMS)子宫结合带中的表达水平及临床意义。**方法** 收集因 EMS 行子宫切除术的子宫结合带蜡块组织 43 例为 EMS 组, 其中增生期 25 例, 分泌期 18 例。收集同期因宫颈癌、卵巢癌或宫颈上皮内瘤变 III 级行子宫切除术的患者子宫结合带蜡块组织 54 例为对照组, 其中增生期 28 例, 分泌期 26 例。采用免疫组织化学方法检测各组子宫结合带组织中 OTR 的表达水平。**结果** 对照组增生期子宫结合带 OTR( $0.156 \pm 0.056$ )表达高于分泌期子宫结合带 OTR( $0.126 \pm 0.030$ ), 差异有统计学意义( $P=0.017$ )。EMS 组增生期( $0.205 \pm 0.106$ )和分泌期( $0.187 \pm 0.070$ )子宫结合带 OTR 含量表达无统计学差异( $P=0.523$ ), 且含量分别高于对照组( $0.156 \pm 0.056$ ,  $0.126 \pm 0.030$ )相应月经周期子宫结合带 OTR 的表达, 差异均有统计学意义( $P=0.043$ ,  $P=0.002$ )。EMS 组子宫结合带中 OTR 的表达水平与痛经程度呈正相关( $r=0.836$ ,  $P<0.05$ )。**结论** EMS 子宫结合带缩宫素受体异常高表达, 表明其可能和 EMS 的发病及引起的相关症状有关。

**【关键词】** 子宫内膜异位症(EMS); 缩宫素受体(OTR); 子宫结合带

**基金项目:** 安徽高校自然科学研究任务项目(KJ2015A056)

· 临床研究 ·

**The expression of oxytocin receptor in uterine junctional zone of women with endometriosis**

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**【Abstract】 Objective** To explore the expression and clinical significance of oxytocin receptor (OTR) in the junctional zone (JZ) in women with endometriosis (EMS). **Methods** Forty-three patients with EMS (including 25 cases in proliferative phase and 18 cases in secretory phase) undergoing hysterectomy were selected as EMS group. The tissues of uterine JZ were obtained. In the meantime, 54 patients (including 28 cases in proliferative phase and 26 cases in secretory phase) with cervical carcinoma, ovarian cancer or cervical intraepithelial neoplasia were selected as control group. Immunohistochemistry technique was used to detect the protein expression of OTR in the uterine JZ with and without EMS. **Results** In control group, the OTR expression of the uterine junctional in proliferative group was  $0.156 \pm 0.056$ , which was significantly higher than that of secretory phase ( $0.126 \pm 0.030$ ) ( $P=0.017$ ). In EMS group, the difference of the OTR expression of the uterine JZ between the proliferative phase ( $0.205 \pm 0.106$ ) and secretory phase ( $0.187 \pm 0.070$ ) had no statistical significance ( $P=0.523$ ). The expressions of OTR in the uterine JZ of proliferative phase of EMS group and control group ( $0.156 \pm 0.056$ ) showed a significant difference ( $P=0.043$ ). Similarly, the OTR expression in the uterine JZ of secretory phase was significantly higher than that ( $0.126 \pm 0.030$ ) of control group ( $P=0.002$ ). The expression level of OTR in the uterine JZ of women with EMS is positively correlated with the degree of dysmenorrhea ( $r=0.836$ ,  $P<0.05$ ). **Conclusion** The higher expression of OTR in the uterine JZ of EMS might be associated with pathogenesis and related symptoms of EMS.

**【Key words】** Endometriosis (EMS); Oxytocin receptor (OTR); Uterine junctional zone

**Fund program:** Natural Science Research Program of Anhui Province (KJ2015A056)

· 流行病学研究 ·

# 中国中小学女生月经初潮年龄和月经模式调查分析

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DOI: 10.3760/cma.j.issn.2096-2916.2017.03.007

**【摘要】目的** 调查我国青春期在校女生月经初潮情况及初潮后月经模式的变化规律。**方法** 采用分阶段整群抽样, 对全国 8 个省城市和农村的 5 981 例小学五年级到高中三年级的女生进行计算机辅助的自填问卷调查, 总结我国在校青春期女生月经初潮情况及初潮后月经模式的变化规律。**结果** 共调查 5 981 例女生, 平均月经初潮年龄为 $(12.7 \pm 0.0)$ 岁, 城市及农村女生初潮年龄分别为 $(12.4 \pm 0.0)$ 岁和 $(13.0 \pm 0.0)$ 岁( $P < 0.01$ )。月经初潮到月经规律平均间隔时间为 $(1.2 \pm 0.0)$ 年。按月经初潮后不同时间分层分析显示初潮后随时间推移规律周期比例无明显变化( $P = 0.33$ ); 经期 4~7 d、经量适中的女生比例逐渐增加( $P < 0.01$ ); 痛经发生率逐渐增加( $P < 0.01$ ), 痛经程度逐渐加重( $P < 0.01$ )。**结论** 城市女生月经初潮年龄较农村女生提前 0.6 年; 初潮 1 年后规律月经周期比例随时间推移无明显变化, 经期及经量逐渐转变为性成熟女性模式; 痛经比例及中重度痛经比例逐年增加。

**【关键词】** 月经初潮; 青春期发育; 女生; 痛经

**基金项目:** 国家“十二五”科技支撑计划(2012BAI32B02)

· 流行病学研究 ·

**Age at menarche and menstrual cycle pattern among school adolescent girls in China** Luo Shan,

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**【Abstract】 Objective** To determine the age at menarche and patterns of menstruation among school girls in China. **Methods** With multi-stage sampling, 5 981 primary and middle school students from both urban and rural areas in eight provinces were investigated anonymously with the method of computer assisted self-interview (CASI). **Results** Menarche was attained at the age of ( $12.7 \pm 0.0$ ) years, ( $12.4 \pm 0.0$ ) years and ( $13.0 \pm 0.0$ ) years for urban and rural respectively ( $P < 0.01$ ). The mean interval between menarche and regular cycle was ( $1.2 \pm 0.0$ ) years. Analysis on the menstrual cycle pattern according to the time post menarche showed that the proportion of participants with regular cycle were similar in different time post menarche ( $P = 0.33$ ); the proportion of participants with blood flow duration between 4–7 d and moderate blood flow were increased with time ( $P < 0.01$ ); the incidence of dysmenorrhoea and degree of pain were increased with time ( $P < 0.01$ ). **Conclusion** The age of menarche of urban was 0.6 year earlier than that of rural. The proportion of participants with regular cycle was similar after 1 year postmenarche. The duration and amount of menstrual blood flow become the pattern of adult women with time. The incidence of dysmenorrhoea and severe pain increased with time.

**【Key words】** Menarche; Puberty development; Girls; Dysmenorrhoea

**Fund program:** the National Key Technology R&D Program of China (2012BAI32B02)



# 中国妇女流产后计划生育服务与实施效果的系统评价与 Meta 分析

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DOI: 10.3760/cma.j.issn.2096-2916.2017.03.008

**【摘要】目的** 系统评价中国妇女流产后计划生育服务与重复流产和意外妊娠等的相关性, 为提高中国妇女的避孕率和降低流产率提供参考依据。**方法** 计算机系统检索了 PubMed、Cochrane Library、CNKI、万方数据库(Wanfang Data)、中国生物医学文献数据库(CBM), 查找与中国妇女流产后计划生育服务相关的随机对照试验(RCT)。严格按照纳入和排除标准筛选文献并提取相关数据。质量评价后, 用 RevMan5.3 和 Stata12.1 软件进行 Meta 分析。**结果** 最终纳入 17 项研究, 共涉及 15 436 名人工流产妇女, 并且纳入的文献不存在发表偏倚。研究结果表明, 人工流产的主要原因是未采取避孕措施和避孕失败, 并且中国目前存在相对较高的重复流产率。与未实施流产后计划生育服务的妇女相比, 流产后计划生育服务可以提高避孕率, 降低意外妊娠率( $OR=0.27$ , 95%  $CI=0.20\sim0.35$ ,  $P<0.000\ 01$ )和重复流产率( $OR=0.21$ , 95%  $CI=0.18\sim0.24$ ,  $P<0.000\ 01$ )。**结论** 合理的流产后计划生育服务可以提高无生育要求女性的避孕率, 降低意外妊娠的发生率和重复流产率。

**【关键词】** 人工流产; 计划生育; 流产后服务; Meta 分析; 随机对照试验(RCT)

# Intervention effect of post abortion family planning care in China: a systematic review and Meta-analysis

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**【Abstract】 Objective** To explore the correlation between post abortion family planning care and repeat abortion, unintentional pregnancy, in order to provide a reference to increase contraception and reduce the repeat abortion. **Methods** The electronic databases, such as PubMed, the Cochrane Library, CNKI, Wanfang Data and China Biology Medicine disc (CBM) were systematically searched to find the randomized control trails (RCTs) related to post abortion family planning care in China. The studies were selected strictly according to the inclusion and exclusion criteria, followed by extracting data. After quality assessment, the Meta-analysis was performed using RevMan5.3 and Stata12.0 software. **Results** A total of 17 articles were reviewed and the 15 426 participants were involved. Besides, there is no public bias in the reviewed studies. The results showed that the main induced abortion reasons were not using contraceptive methods and contraceptive failure and the rate of repeated abortions was higher in China. Compared with no PAC group, post abortion family planning care can increase the contraception rate, reduce the unintentional pregnancies ( $OR=0.27$ , 95%  $CI=0.20-0.35$ ),  $P<0.000\ 01$ ) and repeat abortions ( $OR=0.21$ , 95%  $CI=0.18-0.24$ ,  $P<0.000\ 01$ ). **Conclusion** Post abortion family planning care in China can increase the rate of using contraception measures. In addition, it can reduce the unwanted pregnancy rate and occurrence of repeated abortion.

**【Key words】** Induced abortion; Family planning; Post-abortion care (PAC); Meta-analysis; Randomized control trials (RCT)

· 临床报道 ·

## 子宫内膜异位症合并不孕患者经体外受精 / 卵胞质内单精子注射 - 胚胎移植治疗后妊娠结局及相关因素的分析

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DOI: 10.3760/cma.j.issn.2096-2916.2017.03.009

**【摘要】目的** 探讨子宫内膜异位症(EMS)对不孕患者经体外受精 / 卵胞质内单精子注射 - 胚胎移植(IVF/ICSI-ET)治疗后妊娠结局的影响及其与妊娠结局相关的因素。**方法** 选择行 IVF/ICSI-ET 治疗的 46 例 EMS 合并不孕患者的 55 个取卵周期作为 EMS 组; 选择同期行 IVF/ICSI-ET 治疗的 126 例非 EMS 患者的 156 个周期作为对照组。回顾性分析患者的临床资料, 并进一步分析与妊娠结局相关的因素。**结果** EMS 组 CA-125 水平、周期取消率显著高于对照组( $P<0.05$ ); 基础窦卵泡数(AFC)、hCG 注射日成熟卵泡数、获卵数、MII 卵数、双原核(2PN)数、卵裂数、优质胚胎数、优质胚胎率显著低于对照组( $P<0.05$ ); hCG 注射日成熟卵泡数与 EMS 患者未妊娠的相关回归系数 $<0$ 。**结论** EMS 合并不孕患者卵巢储备功能下降, 卵子和胚胎质量下降, 更易取消周期。但其卵子成熟率、正常受精率及临床结局与非 EMS 对照组不孕患者相比无统计学差异; hCG 注射日成熟卵泡数是 EMS 患者妊娠的保护因素。

**【关键词】** 子宫内膜异位症(EMS); 体外受精 - 胚胎移植(IVF-ET); 临床妊娠率; 活产率

• 临床报道 •

**Analysis of pregnancy outcome and related factors after *in vitro* fertilization/intracytoplasmic sperm injection and embryo transfer treatment in infertility patients with endometriosis**

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**【Abstract】 Objective** To investigate the effects of endometriosis (EMS) on the outcome of pregnancy and the factors associated with pregnancy outcome after *in vitro* fertilization/intracytoplasmic sperm injection and embryo transfer (IVF/ICSI-ET) treatment in infertile patients. **Methods** Totally 55 oocyte retrieval cycles of 46 cases of EMS associated with infertility patients were selected as EMS group. And 156 oocyte retrieval cycles of 126 cases of non EMS patients during the same period were selected as control group. The clinical data were analyzed between the two groups retrospectively, and a further analysis of the factors associated with pregnancy outcome in the two groups was performed. **Results** The levels of CA-125 and the canceling rate of the cycle in EMS group was significantly higher than the control ( $P<0.05$ ); basic antral follicle count (AFC), number of mature follicles on the hCG injection day, retrieved oocytes, M<sub>II</sub> oocytes, pronuclear (2PN), normal cleavage, high-quality embryo and high-quality embryo rate in EMS group were significantly lower than those in the control ( $P<0.05$ ). The correlation regression coefficient between number of mature follicles on hCG injection day and infertility outcomes in patients with EMS was less than 0. **Conclusion** Ovarian reserve function in infertility patients with EMS is decreased, and the quality of eggs and embryos are decreased, which is more likely to cancel cycles. But the egg maturation rate, normal fertilization rate and clinical outcome in infertile patients with EMS have no significant difference when compared with infertility patients without EMS. The number of mature follicles on hCG injection day is the protective factor of pregnancy in EMS patients.

**【Key words】** Endometriosis (EMS); *In vitro* fertilization and embryo transfer (IVF-ET); Clinical pregnancy rate; Live birth rate

· 现场调查 ·

## 深圳坪山新区外来女工生殖道感染就医状况 及其相关因素分析

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DOI: 10.7669/j.issn.2096-2916X.2017.03.010

**【摘要】目的** 了解深圳坪山新区外来女工生殖道感染(RTI)就医状况并分析其影响因素。**方法** 采用整群随机抽样方法确定研究对象, 使用统一的问卷调查其基本人口学特征和 RTI 就医状况以及相关因素, 利用 SPSS19.0 和 SAS9.1 软件进行数据分析。**结果** 1 480 名外来女工中, 467 人(31.6%)报告近 3 个月至少有一种 RTI 症状。68.6% 出现症状后去过医院就诊; 未就诊的 144 人中, 有 12.6% 选择自己到药店买药吃, 30.7% 选择自己处理(用洗液冲洗), 而 56.7% 的女工对疾病不理睬。多水平模型分析显示: 相比单独居住的女工, 与丈夫或男友居住的女工患病后不去就诊的可能性低( $OR=0.311$ ); 没有获得过 RTI 宣教服务的女工患病后不去就诊的可能性比获得过 RTI 宣教服务的女工高( $OR=0.838$ )。**结论** 深圳坪山新区女工自我报告 RTI 比例较高且就医状况并不乐观。应加强生殖健康知识的宣传, 提高女工就医意识。

**【关键词】** 外来女工; 生殖道感染(RTI); 就医行为

**基金项目:** 深圳市坪山新区卫生系统科研孵化资金资助项目(201232)

· 现场调查 ·

**Health care seeking behavior for reproductive tract infection and its associated factors among female migrants in Pingshan New District, Shenzhen** Amina ·Humaer, Yan Hong, Wang Zhaohui, Shi Lishuo, Yang Juan, Yu Liping

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**【Abstract】 Objective** To understand health care seeking behavior for reproductive tract infections (RTIs) and its influence factors among female migrants in Pingshan New District, Shenzhen. **Methods** Totally 1 480 female migrants were recruited by cluster random sampling and completed questionnaire involved the basic demographic characteristics, RTI treatment status and related factors. SPSS19.0 and SAS9.1 were performed to analyze data. **Results** Of 1 480 female migrants, 467 (31.6%) women had at least one RTI symptoms in the past three months, and 68.6% of them had sought health care after medical symptoms. Among 144 women who didn't seek treatment, 12.6% bought some medicine themselves, 30.7% rinsed with lotion and 56.7% didn't take any measure. Multilevel model analysis showed that after illness, women who lived with husbands or boyfriends informants were more likely to go to the hospital ( $OR=0.311$ ), and women who did not obtain the RTI knowledge were less likely to seek treatment to hospital. **Conclusion** RTI symptoms were prevalent among female migrants and quite a few women still didn't seek health care. Health education for RTI needs to be strengthened targeting female migrants.

**【Key words】** Female migrants; Reproductive tract infection (RCT); Health care seeking behavior

**Fund program:** Shenzhen Pingsha New District Healthy system Incubation Funding for Scientific Research Projects (201232)

· 综述 ·

## 低剂量阿司匹林对子宫内膜容受性的影响

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DOI: 10.3760/cma.j.issn.2096-2916.2017.03.011

**【摘要】** 子宫内膜容受性(ER)是胚胎能否成功种植的关键因素之一。近年来, 阿司匹林已广泛应用于辅助生殖技术中来改善 ER 和提高临床妊娠率。本文就小剂量阿司匹林对子宫内膜容受性的影响进行综述。

**【关键词】** 子宫内膜容受性; 阿司匹林; 辅助生殖技术(ART); 临床妊娠率

• 综述 •

**Effects of low-dose aspirin on endometrial receptivity** Wang Xue, He Xiaojin, Cao Yunxia

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**【Abstract】** Endometrial receptivity is one of the key factors in the successful implantation. In recent years, aspirin has been widely used in assisted reproductive technology to improve the endometrial receptivity and clinical pregnancy rate. This paper summarized the effects of low-dose aspirin on the endometrial receptivity.

**【Key words】** Endometrial receptivity (ER); Aspirin; Assisted reproductive technology (ART); Clinical pregnancy rate



## 植入前遗传学诊断 / 筛查技术指征进展

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DOI: 10.3760/cma.j.issn.2096-2916.2017.03.012

**【摘要】** 植入前遗传学诊断 / 筛查(PGD/PGS)技术发展多年, 其指征始终存在争议。PGD 指征较为明确, 单基因遗传病、染色体异常人群、人类白细胞抗原(HLA)配型为其适用人群。PGS 的指征争议较多, 主要面向反复流产、反复植入失败、高龄人群, 目的是提高妊娠率及活产率。然而第一代 PGS 技术[PGS#1, 卵裂球活检及荧光原位杂交(FISH)-PGS]技术未显示明显效果, 甚至降低了妊娠率及活产率。第二代 PGS 技术(PGS2.0)增加了严重男性因素不育为指征, 其核心为囊胚活检及全染色体筛查(CCS), 对上述人群的临床效果较为明显, 降低了流产风险并提高了成功率及活产率。PGS2.0 已极大地改变了辅助生殖技术(ART)面貌, 可能成为未来生殖中心对所有患者的一个常规项目。目前仍然需要多中心前瞻性随机病例对照研究重新评估 PGS。

**【关键词】** 植入前遗传学诊断(PGD); 植入前遗传学筛查(PGS); 辅助生殖技术(ART); 荧光原位杂交(FISH); 全染色体筛查(CCS)

**基金项目:** 上海市卫生和计划生育委员会科研课题资助项目(201640365)

· 综述 ·

**Advances in indications of preimplantation genetic diagnosis/screening**    *Lei Caixia, Zhang Yueping,*

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**【Abstract】** Controversies in indications of preimplantation genetic diagnosis (PGD)/preimplantation genetic screening (PGS) are developing with the rapid improvement of the technology for years. PGD is clearly indicated for monogenetic diseases, chromosome abnormalities and HLA typing, while PGS is ambiguous in indications, with the purpose to improve fertility rate and take-home baby rate for patients suffered from recurrent spontaneous abortion (RSA), recurrent implantation failure and advanced maternal age. However, the first generation PGS technology [PGS#1, biopsy of blastomere plus fluorescent *in situ* hybridization (FISH)-PGS] has failed to provide promising clinical effect, and to the contrary decreased the fertility and take-home baby rate. The second generation PGS technology (PGS2.0), which is focused on biopsy of blastocyst plus comprehensive chromosome screening (CCS) and adds severe male infertility factor as an indicator, has shown promising clinical effect of decreased abortion rate and increased fertility and take-home baby rate. PGS2.0 has dramatically changed features of assisted reproductive technology, and may probably become a routine item for all patients in reproductive centers in the future. Multicenter prospective random case control study is still needed for reevaluate effect of PGS.

**【Key words】** Preimplantation genetic diagnosis (PGD); Preimplantation genetic screening (PGS); Assisted reproductive technology (ART); Fluorescent *in situ* hybridization (FISH); Comprehensive chromosome screening (CCS)

**Fund program:** Shanghai Municipal Commission of Health and Family Planning Project (201640365)

## 胚胎围植入期的内膜血管新生相关研究进展

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DOI: 10.3760/cma.j.issn.2096-2916.2017.03.013

**【摘要】** 胚胎在具有容受性的内膜中充分植入是成功妊娠的前提, 胚胎植入是一个受到精确调控的生理过程, 可概括为胚胎的定位、黏附和侵入 3 个阶段。血管新生贯穿于子宫内膜周期性变化和胚胎植入过程, 并为胚胎的发育提供了重要的物质基础。本文就血管内皮生长因子(VEGF)、成纤维细胞生长因子(FGF)、转化生长因子(TGF)、血管生成素(Ang)、整合素(integrin)等血管新生相关因子, 在胚胎植入前内膜准备和胚胎植入过程中的表达规律及子宫内膜血流灌注超声评价 2 个方面进行综述, 为进一步干预血管新生过程, 改善子宫内膜容受性和提高胚胎种植成功率奠定基础。

**【关键词】** 胚胎植入; 血管新生; 内膜容受性; 超声

**基金项目:** 江苏省卫生厅项目(H201311); 苏州市卫生局科技项目(LCXZ201302); 苏州市医学重点学科(生殖医学)资助

• 综述 •

**Advances in vasculogenesis and angiogenesis of endometrium during the peri-implantation period**

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**【Abstract】** Successful pregnancy is dependent upon the adequate implantation of a competent embryo into receptive endometrium. Embryo implantation is regulated by a complicated physiological process, involving apposition, adhesion and invasion. Vasculogenesis occur in menstrual cycle and implantation process supplying important substance for the development of embryo. This paper will review the expression regularity of angiogenesis related factors, such as vascular endothelial growth factor (VEGF), fibroblast growth factor (FGF), transforming growth factor (TGF), angiogenin (Ang) and integrin, in the process of membrane preparation and embryo implantation, and uterine blood flow perfusion ultrasound evaluation, which further lay the foundation for improving endometrial receptivity and increasing embryo implantation rate.

**【Key words】** Embryo implantation; Angiogenesis; Endometrial receptivity; Ultrasound

**Fund program:** Jiangsu Province Health Department (H201311); Science and Technology Project of Suzhou Municipal Health Bureau (LCXZ201302); Suzhou's Key Discipline of Medicine

## 多胎妊娠减胎术发展现状

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DOI: 10.3760/cma.j.issn.2096-2916.2017.03.014

**【摘要】**近 30 年多胎妊娠的发生率显著增加, 对于母婴的围产期结局产生了极大的影响。多胎妊娠减胎术通过在妊娠中减去一个或多个胎儿, 避免多胎分娩, 可改善妊娠结局。影响减胎术后结局的临床因素主要为减胎孕周、手术方式、起始及最终胚胎的数量以及是否合并单绒毛膜多胎。此外, 减胎术前的产前诊断对于选择减胎对象有着准确的指导。本文就多胎妊娠减胎术现状及影响其妊娠结局的相关临床因素做一综述。

**【关键词】** 妊娠; 多胎; 妊娠减少; 妊娠结局; 双生; 单卵; 双胎输血综合征

**基金项目:** 云南省卫生科技计划项目(2014NS253, 2014NS254)

• 综述 •

**Current status of multifetal pregnancy reduction** Bai Yun, Ma Yanping

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**【Abstract】** In recent 30 years, the incidence of multiple pregnancy has increased significantly, which has a great impact on maternal and infant outcomes. Multifetal pregnancy reduction (MFPR) is an ethically acceptable procedure aimed to avoid multiple births and improve pregnancy outcome. The clinical factors that affect the pregnancy outcome of MFPR mainly include the gestational age of reduction, the operation mode, the number of initial and final embryos and whether is multi-pregnancy accompany monochorionic twins. In addition, prenatal diagnosis has an accurate guidance for the selection of the object for MFPR. In this paper, the current status of MFPR and its related clinical factors influencing the outcome of pregnancy were reviewed.

**【Key words】** Pregnancy; Multiple; Pregnancy reduction; Pregnancy outcome; Twins; Monozygotic; Fetofetal transfusion

**Fund program:** Yunan Health Science and Technology Planning Project (2014NS253, 2014NS254)

· 综述 ·

# 流动人口生殖道感染 / 性病 / 艾滋病患病率及危险因素和防治策略

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DOI: 10.3760/cma.j.issn.2096-2916.2017.03.015

**【摘要】** 生殖健康是一个全球性的健康问题, 生殖道感染、性病、艾滋病在全球范围内的患病率和发病率依然较高。除了病原微生物的致病因素外, 人口学(年龄、文化程度、收入等)、知识、态度、行为等因素都会影响人群患病状况。我国的流动人口大多处于性活跃期, 同时存在文化程度不高、月收入水平低、保健意识差等问题, 他们的生殖道感染、性病、艾滋病状况不容乐观。相关防治工作开展多年来, 我国的专家学者从政策、技术服务及个人行为的角度提出了一系列建议, 为改善流动人口生殖健康做出了不懈努力。

**【关键词】** 流动人口; 生殖健康; 患病; 危险因素; 防治

**基金项目:** 国家十二五科技支撑计划(2012BAI32B08)

· 综述 ·

**Prevalence, risk factors and control strategies of reproductive tract infection, sex transmitted disease and acquired immune deficiency syndrome among floating people** Xu Shuangfei, Li Yuyan, Wu Junqing

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**【ABSTRACT】**Reproductive health is a global health problem, and the prevalence and incidence of reproductive tract infections (RTI), sexual transmitted disease (STD) and acquired immune deficiency syndrome(AIDS) was still high. According to current studies, besides pathogenic microorganisms, demography factors (age, education level, income, and so on), knowledge, attitude, behavior and other factors also affected the epidemiologic state. As most floating people in China at sexually active stage, poor education background, low income and poor health-care conscious, the status of their sex and reproductive health is at stake. During recent decades, experts make great contributions to the improvement of the status of RTI, STD and AIDS for floating people from public policy, technical services and individual behaviors.

**【Key words】** Floating people; Reproductive health; Prevalence; Risk factors; Control

**Fund program:** Twelfth Five-Year plan supported by National Science and Technology (2012BAI32B08)



## siRNA 沉默乳腺癌靶基因及递送治疗的研究进展

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DOI: 10.3760/cma.j.issn.2096-2916.2017.03.016

**【摘要】**乳腺癌是最常见的女性恶性肿瘤之一, 其治疗仍然存在多药耐药、复发和转移等问题。近年来, 小干扰 RNA(small interfering RNA, siRNA)在乳腺癌的研究中应用广泛, 并有望成为新型的靶向性基因药物。本文检索近十年来 siRNA 在乳腺癌治疗研究方面的相关文献, 着重从 siRNA 沉默乳腺癌相关的靶基因, siRNA 的递送载体以及 siRNA 联合化疗药物治疗乳腺癌的研究 3 个方面进行综述, 以期为乳腺癌的研究提供新方法和新思路。

**【关键词】**siRNA; 乳腺癌; 靶基因; 递送载体; 联合给药

**基金项目:**上海市科学技术委员会科研计划项目(14JC1492300); 上海市卫生和计划生育委员会科研课题 (20144Y0049); 上海市科学技术委员会科研计划项目(14431902000)

• 综述 •

**Targets and delivery systems of small interfering RNA in breast cancer therapy** Xue Man, Pu Tianlei,

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**【Abstract】** Breast cancer is the most common invasive malignancy among females. In the treatment of breast cancer, multidrug resistance, recurrence and metastasis are still major obstacles leading to the failure of therapy. Small interfering RNA (siRNA), a novel and promising targeted gene drug, is applied widely for breast cancer research. This paper reviews and summarizes the targets of siRNA in breast cancer research, delivery systems of siRNA and the concomitant strategies by combining with chemotherapies agents, to provide references and strategies for the further breast cancer treatment.

**【Key words】** small interfering RNA (siRNA); Breast cancer; Target genes; Delivery systems; Combined administration

**Fund program:** Science Research Program of Shanghai Science and Technology Committee (14JC1492300); Science Research Project of Shanghai Municipal Commission of Health and Family Planning (20144Y0049); Science Research Program of Shanghai Science and Technology Committee (14431902000)