

· 实验研究 ·

## 环孢素 A 通过活化 Src 信号通路促进 人绒毛膜癌细胞株 JEG-3 侵袭

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**【摘要】**目的: 探讨 Src 信号通路在环孢素 A(cyclosporin A, CsA)促进人滋养细胞侵袭中的作用。方法: 应用 Transwell 侵袭实验观察 CsA 对人绒毛膜癌细胞株 JEG-3 侵袭能力的影响, 应用 Western blotting 检测 CsA 作用于 JEG-3 细胞后 Src 的活化水平, 并观察 Src 特异性抑制剂 PP2 对 CsA 作用后 JEG-3 细胞侵袭能力及 E-钙粘蛋白表达水平的变化。结果: CsA 可明显促进 JEG-3 细胞的侵袭 ( $P<0.05$ ), 并可提高 JEG-3 细胞 Src 的活化水平 ( $P<0.05$ ), 降低 E-钙粘素蛋白的表达。PP2 可明显抑制 JEG-3 细胞 CsA 诱导的 Src 活化 ( $P<0.05$ ), 阻抑 CsA 对细胞侵袭的促进作用 ( $P<0.05$ ) 和恢复 CsA 下调的 E-钙粘蛋白表达水平 ( $P<0.05$ )。结论: CsA 可通过增强 Src 信号通路活化促进 JEG-3 细胞侵袭, 并下调 E-钙粘蛋白的表达, 提示 Src 信号通路可能参与 CsA 对人滋养细胞生物学行为的良性调节作用。

**关键词:** 环孢素 A(CsA); 侵袭; Src; E-钙粘蛋白; 滋养细胞

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## **Cyclosporin A Enhances the Invasion of Human Choriocarcinoma JEG-3 Cells via Src Signaling Pathway**

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**【ABSTRACT】Objective:** To investigate the role of Src signaling pathway on the cyclosporin A (CsA)-induced invasion of human trophoblast cells. **Methods:** The effects of CsA on the invasion of human choriocarcinoma JEG-3 cells, like extra villous trophoblast, were examined by Transwell matrigel invasion assay. The phosphorylation of Src and the expression of E-cadherin of JEG-3 cells influenced by CsA were evaluated by Western blotting. **Results:** CsA increased the invasion index of JEG-3 cells. In addition, CsA improved the Src activation of JEG-3 cells in a time-dependent manner. PP2, a specific inhibitor of Src, inhibited the CsA-enhanced invasion and restored the E-cadherin expression which was down-regulated by CsA of JEG-3 cells. **Conclusion:** CsA enhances the invasion and down-regulates the E-cadherin expression of JEG-3 cells through activation of Src signaling pathway, which suggests Src signaling pathway may be involved in the favorable modulation by CsA in human trophoblast cells.

**Key words:** cyclosporin A (CsA); invasion; E-cadherin; Src; trophoblast cell

# 巴弗洛霉素 A1 抑制卵巢癌细胞 SKOV3 自噬 并增强化疗敏感性的作用机制

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**【摘要】**目的: 研究巴弗洛霉素 A1(bafilomycin A1)对 5- 氟尿嘧啶(5-FU)作用下的卵巢癌细胞 SKOV3 自噬的抑制作用及其增强化疗敏感性的可能机制。方法: 将 SKOV3 细胞随机分为 3 组, A 组: 50  $\mu\text{mol/L}$  5- 氟尿嘧啶(5-FU)处理 48 h; B 组: 100 nmol/L 巴弗洛霉素 A1 给药 1 h 后加入 50  $\mu\text{mol/L}$  5-FU 处理 48 h; C 组(阴性对照): 不作任何处理。3 组细胞均应用吖啶橙染色、间接免疫荧光技术检测卵巢癌细胞 SKOV3 自噬形态学变化; 并通过 Western blotting 检测巴弗洛霉素 A1 对 SKOV3 细胞中微管相关蛋白轻链 3(LC3)及自噬相关蛋白 Beclin1 表达的影响。结果: B 组产生的红色酸性区域明显减少, LC3 定位的荧光亮度减弱, 细胞内 LC3、Beclin1 蛋白表达量显著降低。结论: 巴弗洛霉素 A1 可能通过减少 SKOV3 细胞酸性区域的数量, 抑制 LC3 产生从而抑制 SKOV3 细胞的自噬。

**关键词:** 巴弗洛霉素 A1(bafilomycin A1); 5- 氟尿嘧啶(5-FU); 卵巢癌细胞; 细胞自噬;  
微管相关蛋白轻链 3(LC3); 自噬相关蛋白(Beclin1)

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## **Bafilomycin A1 Enhanced Effects of Ovarian Cancer Cell SKOV3 Chemotherapy Sensitivity by Inhibiting Autophagy**

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**【ABSTRACT】 Objective:** To explore the inhibition effects of bafilomycin A1 on the autophagy of ovarian cancer cells SKOV3 handled by 5-fluorouracil (5-FU) and the possible mechanism of enhancing chemotherapy sensitivity. **Methods:** SKOV3 cells were divided into 3 groups, group A were treated with 5-FU (50  $\mu\text{mol/L}$ ) for 48 h, group B were treated with 100 nmol/L bafilomycin A1 for 1 h, then treated for 48 h with 50  $\mu\text{mol/L}$  5-FU, group C were cultured without any treatment as the negative control group. The morphologic changes of ovarian cancer cells SKOV3 with autophagy were observed by acridine orange staining and indirect immunofluorescent assay. The expression of LC3 and Beclin1 proteins in SKOV3 cells were also detected by Western blotting. **Results:** Acidine orange staining showed that the acid areas were markedly decreased in group B. And the immunofluorescent assay showed the treatment of bafilomycin A1 weakened the formation of autophagy. Furthermore, the expression levels of LC3 and Beclin1 proteins in SKOV3 cells were significantly reduced after the treatment of bafilomycin A1. **Conclusion:** Bafilomycin A1 might inhibit the autophagy of SKOV3 cells by reducing the number of acid areas in SKOV3 cells and inhibiting the expression of LC3 and Beclin1 proteins in SKOV3 cells.

**Key words:** bafilomycin A1; 5-fluorouracil (5-FU); ovarian cancer cells; autophagy; LC3; Beclin1

# 鞘脂激活蛋白原(PSAP)在多囊卵巢综合征模型大鼠卵巢中的表达及意义

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**【摘要】**目的: 探讨鞘脂激活蛋白原(PSAP)在多囊卵巢中的表达。方法: 用免疫组织化学、RT-PCR和Western blotting方法检测来曲唑(LE)诱导的多囊卵巢综合征(PCOS)大鼠模型卵巢组织的PSAP表达。结果: LE诱导的PCOS大鼠模型内分泌紊乱, 代谢特点和形态特征均与人的PCOS相似。在PCOS大鼠卵巢中, PSAP mRNA和蛋白表达均增高。结论: PSAP在LE诱导的PCOS大鼠模型卵巢组织中过表达, 并在PCOS发生、发展过程中起到重要的作用。

**关键词:** 多囊卵巢综合征(PCOS); 雄激素受体(AR); 鞘脂激活蛋白原(PSAP); 大鼠; 模型

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## **Expression and Significance of Prosaposin (PSAP) in A Rat Model of Polycystic Ovary Syndrome**

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**【ABSTRACT】 Objective:** To investigate the prosaposin (PSAP) expression in polycystic ovaries. **Methods:** The expression of PSAP was examined using immunohistochemistry, quantitative RT-PCR and Western blotting in a rat model with letrozole-induced polycystic ovary syndrome (PCOS). **Results:** Letrozole-induced PCOS rat models were similar to those in human PCOS in endocrine disturbances, metabolic characteristics and morphology features. And in ovaries of PCOS rat models both mRNA and protein levels of PSAP were increased significantly. **Conclusion:** PSAP was overexpressed in the letrozole-induced PCOS rat model and might play important roles in occurrence and development of PCOS.

**Key words:** PCOS; androgen receptor (AR); prosaposin (PSAP); PCOS rat model

# 整合素 $\alpha_v$ 、 $\alpha_4$ 、 $\beta_3$ 、 $\beta_1$ 在不同发育时期 小鼠胚卵中的表达

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**【摘要】**目的: 观察小鼠受精后 1~4 d 胚卵(原核期、2-细胞期、4~8-细胞期、胚泡期)整合素  $\alpha_v$ 、 $\alpha_4$ 、 $\beta_3$ 、 $\beta_1$  的表达。方法: 用免疫组织化学 ABC 法检测妊娠 1~4 d 小鼠胚卵整合素  $\alpha_v$ 、 $\alpha_4$ 、 $\beta_3$ 、 $\beta_1$  的表达。结果: 整合素  $\alpha_v$ 、 $\alpha_4$ 、 $\beta_3$ 、 $\beta_1$  在小鼠妊娠 1~4 d 的胚卵上均有表达, 表达强弱不等。整合素  $\alpha_v$ 、 $\alpha_4$ 、 $\beta_3$  在受精后第 2 日表达最强, 整合素  $\beta_1$  在受精后第 3 日表达最强; 整合素  $\alpha_v$  在受精后第 4 日和  $\alpha_4$ 、 $\beta_3$ 、 $\beta_1$  在受精后第 1 日表达最弱。结论: 妊娠 1~4 d 小鼠胚卵持续表达整合素  $\alpha_v$ 、 $\alpha_4$ 、 $\beta_3$ 、 $\beta_1$ , 提示它们可能与小鼠胚卵在输卵管中的运输有关。

**关键词:** 整合素; 胚卵; 小鼠; 免疫组织化学

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## Expression of Integrin $\alpha_v$ , $\alpha_4$ , $\beta_3$ , $\beta_1$ in Mouse Zygote/Embryo during the Different Developing Periods

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**【ABSTRACT】Objective:** To investigate the expression of integrin  $\alpha_v$ ,  $\alpha_4$ ,  $\beta_3$  and  $\beta_1$  in the mouse embryo including zygote, 2-cell stage, morula and blastocyst. **Methods:** Immunohistochemistry ABC was used to detect the expression of integrin  $\alpha_v$ ,  $\alpha_4$ ,  $\beta_3$  and  $\beta_1$  on the mouse embryo. **Results:** Integrin  $\alpha_v$ ,  $\alpha_4$ ,  $\beta_3$  and  $\beta_1$  were expressed on the embryos from 1 d to 4 d after mice were pregnancy and the expression strength was different. The expressions of integrin  $\alpha_v$ ,  $\alpha_4$  and  $\beta_1$  were strongest on day 2 and the expression of integrin  $\beta_3$  was strongest on day 3. The weakest expressions of integrin  $\alpha_v$  and  $\alpha_4$  were on day 4 and the weakest expression of integrin  $\beta_1$  and  $\beta_3$  were on day 1. **Conclusion:** The integrin  $\alpha_v$ ,  $\alpha_4$ ,  $\beta_3$  and  $\beta_1$  were expressed continuously on the embryo from 1 d to 4 d after mice were pregnancy. It was suggested that integrins might be related to the embryo implantation in mice.

**Key words:** integrin; ovigerms; mice; immunohistochemistry



# 人 *HoxA10* 基因真核表达载体构建 和表达产物的鉴定

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**【摘要】**目的: 克隆人子宫内膜容受性标志分子 *HoxA10* 基因的 cDNA, 转入真核细胞载体, 并在 293T 细胞中进行表达和鉴定。方法: 应用 RT-PCR 法从人子宫内膜组织中扩增 *HoxA10* 基因的 cDNA 编码区序列, 将 PCR 产物克隆至 pCMV-HA 真核表达载体中, 测序鉴定该载体。以 Lipofectamine™ 2000 将该载体转染入 293T 细胞中, Western blotting 检测 *HoxA10* 蛋白的表达。结果: PCR 扩增出的人 *HoxA10* 基因 cDNA 正确克隆到了 pCMV-HA 载体, 成功构建了 pCMV-HA-*HoxA10* 重组载体; 将其转染入 293T 细胞, 用 *HoxA10* 和 HA 抗体进行 Western blotting, 均检测到了融合蛋白的表达。结论: 携带有 HA 蛋白标签的人 *HoxA10* 基因的真核表达载体 pCMV-HA-*HoxA10* 克隆及表达成功, 为进一步研究 *HoxA10* 与其它蛋白质的相互作用以及建立 *HoxA10* 的荧光素酶报告基因分析系统奠定了基础。

**关键词:** *HoxA10* 基因; 真核表达载体; 293T 细胞; HA 标签; 基因表达

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## Construction and Identification of Eukaryotic Expression Vector Bearing Human *HoxA10* Gene

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**【ABSTRACT】 Objective:** To clone the cDNA of human *HoxA10* gene, and to construct eukaryotic expression vector of *HoxA10* for expression and identification in 293T cell line. **Methods:** cDNA fragment of *HoxA10* was amplified from human endometrium by RT-PCR and cloned into eukaryotic expression vector pCMV-HA. The positive clone was confirmed by sequencing. The recombinant plasmid was transiently transfected into 293T cell line with Lipofectamine<sup>TM</sup>2000. The protein expression of *HoxA10* was detected by Western blotting. **Results:** Eukaryotic expression vector pCMV-HA-*HoxA10* containing coding region of human *HoxA10* gene was successfully constructed. 293T cells transfected with the recombinant plasmid expressed high level of recombinant *HoxA10* protein detected by Western blotting using *HoxA10* and HA antibodies. **Conclusion:** The construction and the expression of pCMV-HA-*HoxA10* were achieved successfully, which has prepared for the experimental ground for further studies of *HoxA10* interacting proteins and establishment of *HoxA10* luciferase reporter assay system.

**Key words:** *HoxA10* gene; eukaryotic expression vector; 293T cell line; HA tag; gene expression

· 临床研究 ·

## 卵泡液和卵裂期胚胎培养液可溶性人类 白细胞抗原G(sHLA-G)的表达 与IVF-ET结局的相关性研究

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**【摘要】**目的: 探讨卵泡液和卵裂期胚胎培养液中可溶性人类白细胞抗原 G(sHLA-G)与卵裂期胚胎发育以及IVF-ET后临床妊娠率的关系, 为临床优选卵母细胞及移植胚胎提供一种有效的非侵入性检测途径。方法: 采用酶联免疫吸附试验(ELISA)检测取卵日卵泡液及第3日移植胚胎培养液中sHLA-G的表达及表达量, 将40例患者分为sHLA-G表达阳性组( $n=15$ )和sHLA-G表达阴性组( $n=25$ )进行比较分析。结果: 40份患者卵泡液sHLA-G阳性率为37.5%(15/40), 87份第3日移植胚胎培养液中sHLA-G阳性率为56.32%(49/87), 卵泡液和胚胎培养液sHLA-G阳性组与阴性组的获卵数和受精率均无差异( $P>0.05$ ), sHLA-G阳性组的卵裂率、第3日胚胎卵裂球数、优质胚胎率、临床妊娠率均明显高于阴性组( $P<0.05$ ), 其中胚胎培养液sHLA-G阳性组的临床妊娠率显著高于阴性组( $P<0.01$ )。结论: sHLA-G在部分卵泡液及早期胚胎培养液中均有表达, 反映了胚胎良好的发育和种植潜能, 预示着较好的IVF-ET结局, 是一种优选卵母细胞和移植胚胎的有效非侵入性途径。

**关键词:** 可溶性人类白细胞抗原 G(sHLA-G); 体外受精 - 胚胎移植(IVF-ET); 卵泡液; 胚胎

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## Relationship between the Expression of sHLA-G in Follicular Fluid and Embryo Culture Fluid and the IVF-ET Outcome

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**【ABSTRACT】 Objective:** To investigate the relationship between expression of soluble human leukocyte antigen G (sHLA-G) in follicular fluid and embryo culture fluid and development of cleavage stage embryos and clinical pregnancy rate of IVF-ET and further to provide an effective non-invasive detection method in optimization of oocytes and embryos for implantation. **Methods:** sHLA-G molecules expression in follicular fluid and embryo culture fluid cultured on the third day was detected by ELISA. Then all 40 patients were divided into sHLA-G molecule positive expression group and sHLA-G molecule negative expression group. **Results:** sHLA-G positive rate was 37.5% (15/40) in follicular fluid and 56.32% (49/87) in embryo culture fluid. In follicular fluid and culture medium which cultured the third day of embryo, there was no significant difference in the number of oocytes retrieved and the fertilization rate ( $P>0.05$ ) between sHLA-G expression of positive and negative groups. The number of cells, the cleavage rate, the good-quality embryo rate, the clinical pregnancy rate were significantly higher in sHLA-G positive group than those in the negative group ( $P<0.05$ ), in the positive group of embryo culture fluid sHLA-G expression, the clinical pregnancy rate was significantly higher than that of sHLA-G negative group ( $P<0.01$ ). **Conclusion:** sHLA-G molecules were expressed in the part of the follicular fluid and early embryo culture medium, reflected the embryonic development and cultivation potential, and indicated the better outcome of IVF-ET. It is an effective non-invasive way for selecting preferred oocytes and embryos.

**Key words:** soluble human leukocyte antigen G (sHLA-G); *in vitro* fertilization-embryo transfer (IVF-ET); follicular fluid; embryo

# 左炔诺孕酮紧急避孕失败后继续妊娠者 胎盘微观形态和性激素受体及增殖核抗原 Ki67 和凋亡相关分子 caspase-3/8/9 的表达

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**【摘要】**目的: 明确左炔诺孕酮紧急避孕(LNG-EC)暴露是否对妊娠晚期胎盘产生相关影响。方法: 选择21例末次月经后使用过LNG-EC药孕妇计划剖宫产的产后胎盘为研究组, 21例正常妊娠孕产妇计划剖宫产的产后胎盘为对照组。采用电子显微镜观察胎盘绒毛和细胞器超微结构; 采用免疫组织化学方法检测孕妇胎盘中雌激素受体(ER)、孕激素受体(PR)、雄激素受体(AR)和增殖核抗原Ki67、凋亡相关分子caspase-3/8/9的表达情况。结果: 光学显微镜和电子显微镜下胎盘形态学组间无统计学差异( $P>0.05$ ); 胎盘中ER、PR、AR、Ki67和caspase-3/8/9的表达组间无显著统计学差异( $P>0.05$ )。结论: 左炔诺孕酮用于紧急避孕不影响其失败后妊娠晚期胎盘的形态结构、性激素受体表达和胎盘增殖及老化。

**关键词:** 紧急避孕(EC); 左炔诺孕酮(LNG); 胎盘; 性激素受体

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## **Placenta Micromorphology and Expressions of Steroid Receptors, Proliferating Cell Nuclear Antigen Ki67, Apoptosis Related Molecules caspase-3/8/9, Exposed to Levonorgestrel Used for Emergency Contraception**

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**【ABSTRACT】 Objective:** To evaluate the impact of exposure to levonorgestrel-only emergency contraception (LNG-EC) on late pregnancy placenta. **Methods:** Twenty-one samples of placenta tissues were collected from women who used the LNG-EC after last menstrual period (study group), 21 cases of normal pregnant placenta were collected as control group. Electron microscope was used to investigate the micromorphology configuration, immunohistochemistry was used to investigate the function of the LNG-EC exposed placentas with PR, ER, AR, Ki67 and caspase-3/8/9. **Results:** There was no significant difference between study group and control group in placenta morphologic examination. The expressions of ER, PR, AR, Ki67 and caspase-3/8/9 in placenta between the two groups were not statistically different. **Conclusion:** There was no association between the use of levonorgestrel emergency contraception pills and the morphologic configuration in their later pregnancy placenta, LNG-EC does not interfere the main steroid hormone receptors and the aging of placenta.

**Key words:** emergency contraception (EC); levonorgestrel (LNG); placenta; steroid hormone receptors

# 黄体期改良超长方案在子宫内膜异位症患者IVF中的应用

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**【摘要】** 目的: 探讨改良后的黄体期超长方案降调节在子宫内膜异位症(EMs)和卵巢储备功能稍低患者行IVF治疗中的临床效果。方法: 选取行IVF并确诊为EMs的患者112例, 其中58例患者给予传统黄体期长效方案降调节作为对照组, 54例患者第1次降调节不理想后再次给予降调节者作为研究组, 对比分析研究组和对照组患者的周期取消率、促性腺激素(Gn)使用量、Gn使用天数、获卵数、受精率、临床妊娠率、早期流产率及重度卵巢过度刺激综合征(OHSS)发生率。结果: 研究组患者的临床妊娠率和受精率提高, 周期取消率、流产率和重度OHSS发生率都有所降低。结论: 改良黄体期长方案能够提高EMs患者的临床妊娠率和受精率, 同时减少了周期取消率, 是一种经济有效的降调节方案。

**关键词:** 改良黄体期超长方案; 降调节; 促排卵; 子宫内膜异位症(EMs); IVF

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## **Application of Luteal Phase Modified Super-long Protocol in IVF for Patients with Endometriosis**

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**【ABSTRACT】 Objective:** To explore the clinical effect of modified super-long protocol of down-regulation in IVF treatment for patients with endometriosis (EMs) and low ovarian reserve. **Methods:** Confirmed 112 cases with EMs were collected, 58 patients received traditional super-long program and acted as the control, 54 patients had a non-ideal falling tone for the first time, then recieved the second demotion and attributed to the study group. The cancelled cycle rate, Gn dosage, days of Gn used, the number of oocytes retrieved, the fertilization rate, the clinical pregnancy rate, the early abortion rate and the number of severe OHSS occurred were compared between the two groups. **Results:** In the study group, the fertilization rate and the clinical pregnancy rate were increased, the cancelled cycle rate, the abortion rate and the severe OHSS incidence were reduced. **Conclusion:** The modified long program can improve the clinical pregnancy rate of patients with EMs, while reducing the cycle cancelled rate, and is a cost-effective protocol of down-regulation.

**Key words:** modified super-long protocol; down-regulation; ovulation; endometriosis (EMs); IVF



# 人工流产术前、术后应用缩宫素鼻喷雾剂 对减少出血的临床研究

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**【摘要】**目的: 评价人工流产术前、术后应用缩宫素鼻喷雾剂对减少术中和术后出血的临床效果。方法: 试验组 200 例在手术开始前给予缩宫素鼻喷雾剂, 左、右侧鼻腔各 1 喷(共 8 U), 术后每日 4 次直至阴道出血结束。对照组 200 例不使用缩宫素鼻喷雾剂。观察患者术中出血量、手术时间和术后阴道出血天数。结果: 术中出血量试验组为  $5.6 \pm 2.2$  ml, 对照组为  $10.9 \pm 8.1$  ml( $t=8.87$ ,  $P<0.01$ ); 手术时间试验组为  $7.2 \pm 2.0$  min, 对照组为  $7.6 \pm 1.8$  min( $t=1.264$ ,  $P>0.05$ ); 术后平均阴道出血天数试验组为  $5.0 \pm 1.9$  d, 对照组为  $6.2 \pm 1.7$  d( $t=6.474$ ,  $P<0.01$ )。结论: 人工流产术前、后给予缩宫素鼻喷雾剂能显著减少手术中和手术后出血。

**关键词:** 缩宫素鼻喷雾剂; 人工流产; 出血

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## Clinical Effect of Oxytocin Nasal Spray on Post-abortion Bleeding

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**【ABSTRACT】 Objective:** To evaluate the clinical effect of oxytocin nasal spray administered before surgical termination of first-trimester pregnancy on postoperative bleeding. **Methods:** A randomized controlled trial was conducted. Four hundred women undergoing surgical termination of first-trimester pregnancy were recruited and randomized to 2 groups: oxytocin group (test group,  $n=200$ ) which was sprayed oxytocin nasal spray 8 U before procedure and control group which received no oxtocic agent. The amount of blood loss, operative time and the days of vaginal bleeding were observed. **Results:** The amount of blood loss was  $5.6 \pm 2.2$  ml in oxytocin group vs  $10.9 \pm 8.1$  ml in the control ( $t=8.87$ ,  $P<0.01$ ). There was no significant difference in the duration of the procedure between oxytocin group ( $7.3 \pm 2.0$  min) and the control ( $7.6 \pm 1.8$  min) ( $t=1.264$ ,  $P>0.05$ ). The days of vaginal bleeding were  $5.0 \pm 1.9$  d in oxytocin group and  $6.2 \pm 1.7$  d in the control ( $t=6.474$ ,  $P<0.01$ ). **Conclusion:** Oxytocin nasal spray is a new dosage form for nasal administration. Spraying 8 U oxytocin nasal before operation can effectively reduce the blood loss and postoperative bleeding.

**Key words:** oxytocin nasal spray; induced abortion; hemorrhage

· 综述 ·

## β-连环素在子宫内膜异位症发生发展中的作用

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**【摘要】** β-连环素(β-catenin)为一种胞内糖蛋白, 可与E-钙粘素(E-cadherin)结合形成E-钙粘素/β-连环素复合体参与细胞连接, 或介导Wnt信号转导通路。子宫内膜异位症(EMs)发生、发展的基本病理过程为: 细胞黏附、侵袭及新生血管的形成, 另外EMs的发生发展亦与雌激素有关。β-连环素可能通过E-钙粘素/β-连环素复合体参与EMs细胞的黏附, 通过Wnt/β-连环素参与异位内膜细胞的侵袭及新生血管的形成和雌激素的异常调控。

**关键词:** β-连环素(β-catenin); E-钙粘素(E-cadherin); Wnt信号通路; 子宫内膜异位症(EMs)

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## Role of $\beta$ -catenin in the Occurrence and Development of Endometriosis

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**【ABSTRACT】** As a cytosolic protein,  $\beta$ -catenin not only functions in cell-cell adhesion with E-cadherin but also serves as an important component of the canonical Wnt pathway. The basic pathogenesis of endometriosis (EMs) development includes cell adhesion, invasion and angiogenesis. In addition, the occurrence of EMs associates with estrogen.  $\beta$ -catenin may involve in cell adhesion through E-cadherin/ $\beta$ -catenin complex, as well as participate in the invasion of ectopic endometrial cells, neovascularization and abnormal estrogen regulation by Wnt/ $\beta$ -catenin.

**Key words:**  $\beta$ -catenin; E-cadherin; Wnt pathway; endometriosis (EMs)

# 胰岛素、雄激素、胰岛素样生长因子、血管内皮生长因子对多囊卵巢综合征患者卵泡发育的影响

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**【摘要】**多囊卵巢综合征(polycystic ovary syndrome, PCOS)是一种极为复杂的代谢异常病理状态,它与多基因相关。胰岛素对PCOS患者卵泡的影响很复杂,可能主要与糖代谢和卵泡对FSH的敏感性有关。高雄激素血症在PCOS患者中非常常见,高雄激素会抑制优势卵泡形成,造成闭锁。PCOS的卵巢间质血管内皮生长因子(VEGF)呈高表达,VEGF可能增加卵巢血管化,使更多因子渗透,引起多囊卵巢。胰岛素样生长因子(IGF)系统与PCOS患者亦有很密切的关系,IGF-I具有促进有丝分裂、参与新陈代谢等胰岛素样生物学效应。当IGF-I受体下调时,糖吸收障碍,会导致卵泡发育障碍。影响卵泡发育的因素众多,这些因素之间也存在相互影响的关系,高胰岛素和FSH联合作用会促进卵泡膜细胞产生大量雄激素,高胰岛素又增高IGF-I,胰岛素与LH联合还会增加VEGF的表达,这一切都将影响卵泡生长。

**关键词:** 多囊卵巢综合征(PCOS); 胰岛素; 雄激素; 胰岛素样生长因子(IGF);  
血管内皮生长因子(VEGF)

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## **Effect of Insulin, Androgen, Insulin-like Growth Factor, Vascular Endothelial Growth Factor on the Follicular Development of the PCOS Patients**

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**【ABSTRACT】** Polycystic ovary syndrome (PCOS) is a complex metabolic dysfunction and heterogeneous endocrine disorder, and also a polygenic disease. Insulin has a complex influence on follicles of PCOS patients which may be related to sugar metabolism and the sensitivity of the follicle to FSH. Hyperandrogenism exists commonly in PCOS patients, and can inhibit the formation of dominant follicles and lead to follicular atresia. Vascular endothelial growth factor (VEGF) is highly expressed in ovarian stroma of PCOS patients, and can increase ovarian vascularization, make more cellular factors penetrate into the ovary, and induce polycystic ovary. Insulin-like growth factor (IGF) system also has a very close relationship with PCOS patients. IGF-I has insulin-like biological effects, e.g., it can promote mitosis and participate metabolism. If the expression level of IGF-I receptors is decreased, sugar malabsorption will occur which results in follicular growth disorders. There is a dynamic interaction among the factors which influence follicular development. High level of insulin and FSH can promote theca cells to produce a large number of androgens. High level of insulin can increase IGF-I level. Insulin combined with LH can increase the expression of VEGF. All these combined effects can influence follicular development.

**Key words:** polycystic ovarian syndrome (PCOS); insulin; androgen; insulin-like growth factor (IGF); vascular endothelial growth factor (VEGF)

• 临床报道 •

## 卵巢血流与获卵情况相关性研究

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**【摘要】**目的: 探讨卵巢血流变化与卵子质量、胚胎质量的关系。方法: 在体外受精-胚胎移植(IVF-ET)过程中应用阴道彩色多普勒超声成像技术(TV-CDS)监测人绒毛膜促性腺激素(hCG)注射日双侧卵巢动脉血流的收缩期与舒张末期流速比值(S/D)、阻力指数(RI)、搏动指数(PI)的变化, 分析行IVF-ET治疗的82例患者, 获得159组血流指数数据(因为有5例患者只有一侧卵巢有成熟卵泡)。根据S/D、RI、PI不同值分组, A组:  $S/D \leq 2.0$ , B组:  $S/D=2.1\sim 2.9$ , C组:  $S/D \geq 3.0$ ; D组:  $RI \leq 0.50$ , E组:  $RI=0.51\sim 0.69$ , F组:  $RI \geq 0.70$ ; G组:  $PI \leq 1.00$ , H组:  $PI=1.01\sim 1.49$ , I组:  $PI \geq 1.50$ 。分别比较各组间获卵数、获卵率、M<sub>II</sub>卵数、受精率、卵裂率及优质胚胎数。结果: C组的获卵数、获卵率、M<sub>II</sub>卵数、受精率均高于A组和B组, 但无统计学差异( $P>0.05$ ); B组的卵裂率及优质胚胎数均高于A组和C组, 但无统计学差异( $P>0.05$ )。F组的获卵数、获卵率、M<sub>II</sub>卵数均高于D组和E组, 但无统计学差异( $P>0.05$ )。E组的受精率、卵裂率及优质胚胎数均高于D组和F组, 差异无统计学意义( $P>0.05$ )。I组的获卵率高于G组和H组, 与G组相比, 有统计学差异( $P<0.05$ )。H组的优质胚胎数明显高于G组和I组, 差异有统计学意义( $P<0.05$ ); H组的获卵数、M<sub>II</sub>卵数及受精率均高于G组和I组, 但无统计学差异( $P>0.05$ )。G组的卵裂率高于H组和I组, 但无统计学差异( $P>0.05$ )。结论: hCG注射日卵巢血流PI与获卵率及优质胚胎数有密切关系。

**关键词:** 体外受精-胚胎移植(IVF-ET); 经阴道彩色多普勒; 搏动指数(PI); 阻力指数(RI)

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## Impact of Ovarian Stroma Blood Flow on the Quality of Oocytes and Embryos

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**【ABSTRACT】 Objective:** To explore the relationship between the change of ovarian stroma blood flow and the quality of oocytes and embryos. **Methods:** A total of 82 IVF infertile couples were retrospectively analyzed. The systole/diastole ratio (S/D), resistance index (RI) and pulsation index (PI) of ovarian stroma blood flow on the day of human chorionic gonadotropin (hCG) injection in *in vitro* fertilization and embryo transfer (IVF-ET) were monitored by vaginal color doppler ultrasonic imaging technology (TV-CDS). There were 159 ovarian blood flow index data (only on one side of ovary had mature follicle in 5 patients). All patients were grouped according to the S/D, RI, PI, group A:  $S/D \leq 2.0$ , group B:  $S/D=2.1-2.9$ , group C:  $S/D \geq 3.0$ ; group D:  $RI \leq 0.50$ , Group E:  $RI=0.51-0.69$ , group F:  $RI \geq 0.70$ ; group G:  $PI \leq 1.00$ , group H:  $PI=1.01-1.49$ , group I:  $PI \geq 1.50$ . The number of retrieved oocytes and  $M_{II}$  oocytes, the rate of retrieved oocytes, fertilization and cleavage, the number of good-quality embryos in each group were compared. **Results:** The number of retrieved oocytes and  $M_{II}$  oocytes, the rates of retrieved oocytes, fertilization of group C were higher than those of groups A and B, but there were no significant differences ( $P > 0.05$ ). The rate of cleavage and the number of good-quality embryos of group B were higher than those of groups A and C, but there were no significant differences ( $P > 0.05$ ). The number of retrieved oocytes and  $M_{II}$  oocytes, the rate of retrieved oocytes of group F were higher than those of groups D and E, but there were no significant differences ( $P > 0.05$ ). The rates of fertilization and cleavage, the number of good-quality embryos in group E were obviously higher than those of groups D and F, but there were no significant differences ( $P > 0.05$ ). The rate of retrieved oocytes of group I was obviously higher than that of groups G and H, and there were significant differences when compared with that of group G ( $P < 0.05$ ). The number of good-quality embryos of group H was significantly higher than that of groups G and I ( $P < 0.05$ ). The number of retrieved oocytes and  $M_{II}$  oocytes, the rate of fertilization of group H were higher than those of groups G and I, but there were no significant differences ( $P > 0.05$ ). The rate of cleavage of group G was higher than that of groups H and I, but there were no significant differences ( $P > 0.05$ ). **Conclusion:** The PI of ovarian stroma blood flow on the day of hCG injection has close relation to the rate of retrieved oocytes and the number of good-quality embryos.

**Key words:** IVF-ET; transvaginal color Doppler; pulsatility index (PI); resistive index (RI)



# 行IVF/ICSI各年龄段妇女早期单、双胎妊娠丢失的回顾性研究

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**【摘要】**目的: 分析行IVF/ICSI的各年龄段妊娠妇女早期单、双胎妊娠胚胎丢失的影响因素。方法: 回顾性分析行IVF/ICSI治疗, 授精后第2日或第3日移植2~3个胚胎后单、双胎妊娠周期中早期妊娠囊丢失情况。结果: 共收集到1 674个IVF/ICSI周期, 孕6周单胚胎着床1 077例, 双胚胎着床597例。孕12周时单胎和双胎的继续妊娠数分别为901例(83.66%)和548例(91.79%)( $P<0.001$ )。双胎妊娠中, 21例(3.52%)自然减胎成单胎, 28例(4.69%)自然流产。单胎和双胎妊娠中, 每个着床妊娠囊的丢失率分别为16.34%(176/1 077), 6.45%(741/1 194)( $P<0.001$ )。妊娠妇女早期妊娠囊丢失率单胎者高于同年龄段双胎妊娠者, 26~37岁各年龄段妇女单胎与双胎妊娠丢失率间差异均有统计学意义( $P<0.05$ ),  $\geq 38$ 岁妇女双胎妊娠丢失率显著增加。单胎妊娠组Gn每日用量显著高于双胎妊娠组( $P<0.05$ ), 而受精率及优质胚胎率单胎妊娠组显著低于双胎妊娠组( $P<0.001$ ), Gn每日用量、受精率及优质胚胎率在妊娠丢失组和继续妊娠组间无统计学差异( $P>0.05$ )。结论: 双胎妊娠早期能获得更好的继续妊娠机会, 随年龄增加尤其是 $\geq 38$ 岁妇女, 妊娠丢失显著上升。胚胎形态学质量好则有助于双胚胎着床, 但是对继续妊娠没有直接明显的影响。

**关键词:** 妊娠; 双胎; 妊娠丢失; IVF; 着床

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## Analysis of Early Pregnancy Loss between Single and Twin Pregnant Women with Different Age

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**【ABSTRACT】 Objective:** To analyze influencing factors of early pregnancy loss between pregnant women of single and twin gestations with different age. **Methods:** Analysis of the outcomes of 1 674 pregnancies after double or three embryos transfer on day 2 or 3 after IVF or ICSI treatment was performed retrospectively. **Results:** Of 1 077 single implantations at 6 gestation weeks, 901 cases (83.66%) were ongoing pregnancies. Of 597 multiple implantations at 6 gestation weeks, 548 cases (91.79%) were ongoing multiple pregnancies, at 12 gestation weeks, 21 cases (3.52%) were ongoing singleton pregnancies and 28 cases (4.69%) ended in a spontaneous abortion. Loss rate per gestational sac was 16.34% (176/1 077) and 6.45% (241/1 194) ( $P<0.001$ ) in singleton and twin gestations groups, respectively. Loss per gestational sac in singleton gestation group was significantly higher than that in twin gestations group with the same age, especially between 26–37 year-old ( $P<0.05$ ). Loss per gestational sac in twin gestations group was significantly increased above 38 years old. The dose of Gn used per day was significantly higher ( $P<0.05$ ), but the fertilization rate and the good-quality embryo rate were lower in singleton gestation group than those in twin gestations group ( $P<0.001$ ). The dose of Gn used per day, the fertilization rate and the good-quality embryo rate had no significant differences between ongoing pregnancy group and pregnancy loss group ( $P<0.05$ ). **Conclusion:** The chances of continuation of pregnancy was better in twin pregnancies, but decreased fast with increasing maternal age especially above 38 years old. Although multiple implantations at 6 gestation weeks was predominantly determined by morphological embryo quality, the continuation of pregnancy beyond 6 gestation weeks was independent on morphological embryo quality.

**Key words:** pregnancy; twin; pregnancy loss; IVF; implantation

# 剖宫产后早孕药物流产加服米非司酮的临床观察

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**【摘要】**目的: 探讨剖宫产后早孕药物流产加服米非司酮是否能提高完全流产率。方法: 剖宫产后再次妊娠(停经 $\leq 49$  d)行药物流产的孕妇240例, 随机分为研究组和对照组。对照组120例, 米非司酮75 mg/d(早50 mg, 晚25 mg)连用2 d, 第3日口服米索前列醇600  $\mu$ g; 研究组120例, 在对照组的基础上, 服用米索前列醇后加服米非司酮25 mg, bid  $\times 3$  d。结果: 研究组和对照组的完全流产率分别为92.50%和73.33%, 差异有统计学意义( $P < 0.01$ ), 阴道流血时间分别为 $11.0 \pm 4.0$  d和 $14.7 \pm 5.4$  d, 差异有统计学意义( $P < 0.01$ )。结论: 剖宫产后早孕药物流产加服米非司酮25 mg, bid  $\times 3$  d, 可提高完全流产率, 缩短阴道流血时间。

**关键词:** 米非司酮; 剖宫产; 早孕; 药物流产

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## Clinical Observation on Medical Termination of Early Pregnancy after Cesarean Section by Plus Oral Mifepristone

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**【ABSTRACT】 Objective:** To investigate whether the medical termination plus oral mifepristone can increase the complete abortion rate of early pregnancy after cesarean section. **Methods:** A total of 240 cases of early pregnancy (amenorrhea  $\leq$  49 d) after cesarean section were randomly divided into study group and control group, 120 cases of the control received the oral dose of 75 mg mifepristone for 2 d (50 mg in the morning, 25 mg in the evening), followed by misoprostol of 600  $\mu$ g orally in the morning of the 3rd day. Another 120 cases of the study group took the mifepristone and misoprostol just like the control, after that, 150 mg mifepristone was given in separate doses (25 mg, bid  $\times$  3 d). **Results:** The complete abortion rates in the study group and the control were 92.50% and 73.33% ( $P < 0.01$ ), respectively. The duration of bleeding days in the study group and the control were  $11.0 \pm 4.0$  d and  $14.7 \pm 5.4$  d ( $P < 0.01$ ), respectively. **Conclusion:** Medical termination of early pregnancy after cesarean section by plus oral mifepristone 25 mg, bid  $\times$  3 d can increase the complete abortion rate, shorten the duration of bleeding days, suggesting that it's an effective and safe method.

**Key words:** mifepristone; cesarean section; early pregnancy; medical abortion