

• 实验研究 •

# 骨桥蛋白在肝素结合表皮生长因子样生长因子介导的小鼠胚胎对子宫内膜黏附和扩展中的作用研究

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**【摘要】**目的: 探讨肝素结合表皮生长因子样生长因子(HB-EGF)对小鼠胚胎黏附和扩展中的作用机制。方法: 建立小鼠胚胎与小鼠子宫内膜细胞共培养模型, 分A、B、C、D、E共5组, 分别加入不同浓度的HB-EGF(0  $\mu\text{g/L}$ 、20  $\mu\text{g/L}$ 、50  $\mu\text{g/L}$ 、100  $\mu\text{g/L}$ 、200  $\mu\text{g/L}$ ), 于倒置显微镜下统计各组胚胎黏附率及扩展率; 用免疫组织化学法检测小鼠子宫内膜细胞骨桥蛋白(OPN)的表达及定位, Western blotting法测定各浓度HB-EGF对子宫内膜细胞OPN表达水平的影响, 并分析其与HB-EGF的关联。结果: OPN在小鼠子宫内膜细胞高表达, 主要分布于胞质中, 随HB-EGF浓度升高, 小鼠子宫内膜细胞中OPN的表达增强, 小鼠胚胎对子宫内膜的黏附和扩展率也逐渐增高。结论: HB-EGF可能通过上调小鼠子宫内膜细胞OPN的表达, 促进小鼠胚胎对子宫内膜的黏附和扩展。

**关键词:** 肝素结合表皮生长因子样生长因子(HB-EGF); 骨桥蛋白(OPN); 黏附率; 扩展率; 胚胎着床

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## Role of osteopontin in heparin binding epidermal growth factor like growth factor induced embryo attachment and outgrowth in mouse endometrial cells

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**【ABSTRACT】 Objective:** To investigate the mechanism of heparin binding epidermal growth factor like growth factor (HB-EGF) on the attachment and outgrowth of mouse embryos. **Methods:** An *in vitro* co-culture system of mouse embryos and mouse endometrial cells was established and then was divided into groups A, B, C, D, E with different concentrations of HB-EGF (0  $\mu\text{g/L}$ , 20  $\mu\text{g/L}$ , 50  $\mu\text{g/L}$ , 100  $\mu\text{g/L}$ , 200  $\mu\text{g/L}$ , respectively). Blastocyst attachment and outgrowth rates were then counted under the inverted microscope. Immunocytochemical staining was used to detect the expression and localization of osteopontin (OPN) in mouse endometrial cells. Western blotting was used to detect the expression of OPN in different concentrations of HB-EGF, and the connective relations between them were analyzed. **Results:** OPN was highly expressed in mouse endometrial cells, mainly in cytoplasm; the expression of OPN in mouse endometrial cells was enhanced with the increase of HB-EGF concentrations, the blastocyst attachment and outgrowth rates were also gradually increased. **Conclusion:** By upregulating the expression of OPN in mouse endometrial cells, HB-EGF might promote the mouse embryo implantation.

**Key words:** heparin binding epidermal growth factor like growth factor (HB-EGF); osteopontin (OPN); attachment rate; outgrowth rate; embryo implantation

# 食蟹猴体内自然成熟和体外培养成熟的 卵母细胞对卵胞质内单精子显微注射 (ICSI) 结局的影响

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**【摘要】目的:** 探讨食蟹猴体内自然成熟和体外培养成熟(IVM)的卵母细胞对卵胞质内单精子显微注射(ICSI)结局的影响。**方法:** 选取有正常月经周期和生育功能的13只健康成熟的雌性食蟹猴, 使用优化的促排卵方案进行促排卵后, B超下观察用药后的卵巢情况, 手术取卵后对已成熟的M<sub>II</sub>期卵母细胞进行ICSI, 未成熟的GV及M<sub>I</sub>期卵母细胞在IVM 16~38 h后发育为M<sub>II</sub>期卵母细胞, 再进行ICSI, 观察IVM及体内自然成熟的卵母细胞的受精情况和胚胎发育情况。**结果:** IVM为76.1% ± 14.9%, 受精率为56.79%, 卵裂率为73.91%, 优质胚胎率为44.12%; 体内自然成熟的卵母细胞受精率为68.52%, 卵裂率为94.59%, 优质胚胎率为58.57%。在受精率和卵裂率方面, 两者间均有统计学差异( $P < 0.05$ 和 $P < 0.01$ ), 而优质胚胎率无统计学差异( $P > 0.05$ )。**结论:** 食蟹猴体外培养成熟的卵母细胞对ICSI结局有较大影响。

**关键词:** 食蟹猴; 卵母细胞; 体内自然成熟; 体外培养成熟(IVM); 卵胞质内单精子显微注射(ICSI)

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## Impact of oocytes of *Macaca fascicularis* *in vivo* maturation and *in vitro* maturation on the outcome of intracytoplasmic sperm injection

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**【ABSTRACT】 Objective:** To investigate the impact of oocytes of *Macaca fascicularis* *in vivo* maturation and *in vitro* maturation (IVM) on the outcome of intracytoplasmic sperm injection (ICSI). **Methods:** Thirteen healthy and sexual mature female cynomolgus monkeys were selected, ovarian ultrasound image was observed under ultrasound after ovulation induction through optimal protocol, then oocytes were taken by surgery, all mature M<sub>II</sub> oocytes were performed with ICSI, immature oocytes (include GV and M<sub>I</sub>) were cultured *in vitro*, 16–38 h later, M<sub>II</sub> oocytes of IVM were performed with ICSI, the fertilization of oocytes and the embryonic development *in vitro* culture were then observed and recorded. **Results:** The IVM rate of oocytes was 76.1% ± 14.9%, the fertilization rate, the cleavage rate and the high-quality embryo rate of M<sub>II</sub> oocytes were respectively 56.79%, 73.91% and 44.12%. The fertilization rate, the cleavage rate and the high-quality embryo rate of IVM M<sub>II</sub> oocytes after *in vivo* maturation were respectively 68.52%, 94.59% and 58.57%. Compared between the two groups, there were obvious differences in the fertilization rate and the cleavage rate ( $P < 0.05$  or  $P < 0.01$ ), but there was no obvious difference in high-quality embryo rate ( $P > 0.05$ ). **Conclusion:** Impact of IVM oocytes on the outcome of ICSI was obvious.

**Key words:** cynomolgus monkey (*Macaca fascicularis*); oocytes; *in vivo* maturation; *in vitro* maturation (IVM); intracytoplasmic sperm injection (ICSI)

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· 临床研究 ·

## 配偶淋巴细胞体外诱生免疫及地屈孕酮治疗 不明原因反复自然流产的疗效比较 及对围产期母婴的影响

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**【摘要】**目的: 探讨配偶淋巴细胞体外诱生免疫联合地屈孕酮治疗对不明原因反复自然流产(URSA)患者再次妊娠结局及对孕妇围产期并发症的发生和新生儿发育的影响。方法: 随访分析254例URSA患者, 其中A组84例接受配偶淋巴细胞体外诱生免疫治疗; B组86例接受地屈孕酮治疗; C组84例接受体外诱生免疫联合地屈孕酮治疗; 比较3组患者接受治疗后的再次妊娠成功率, 以及围产期孕产妇的情况和新生儿的发育。结果: 3组患者再次妊娠成功率分别为89.3%、70.9%和92.8%。B组低于其他各组, 且差异有统计学意义( $P < 0.05$ )。3组患者新生儿的分娩孕周无统计学差异( $P > 0.05$ ); 足月新生儿出生体质量及身长组间无统计学差异( $P > 0.05$ ); 各组与正常参照标准比较差异无统计学意义( $P > 0.05$ )。3组间围产期妊娠并发症及新生儿畸形的发生率与流行病学调查数据比较无统计学差异( $P > 0.05$ )。结论: 与单用地屈孕酮治疗比较, 配偶淋巴细胞体外诱生免疫, 或诱生免疫联合地屈孕酮治疗显著增加URSA患者再次妊娠的成功率; 3种方法治疗均不影响新生儿生长发育; 与正常妊娠相比, 3种治疗均不增加孕妇围产期妊娠并发症与新生儿畸形率。

**关键词:** 不明原因反复自然流产(URSA); 地屈孕酮; 配偶淋巴细胞体外诱生免疫

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## **Evaluation of curative effect and safety of treatments for unexplained recurrent spontaneous abortion by paternal lymphocyte *in vitro* induced immunization and dydrogesterone**

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**【ABSTRACT】 Objective:** To evaluate the efficacy and safety of treatments of unexplained recurrent spontaneous abortion (URSA) by paternal lymphocyte *in vitro* induced immunization combined with dydrogesterone on the pregnant outcome as well as on the influence of perinatal complication for the pregnant woman and neonatal development. **Methods:** A total of 254 URSA patients were followed up and analyzed. Among them, 84 cases treated with paternal lymphocyte induced immunization were defined as group A; 86 cases treated orally with dydrogesterone were recruited as group B; 84 cases who accepted therapy by lymphocyte induced immunization combined with dydrogesterone were classified as group C. The pregnancy outcome after treatment as well as the maternal situation and neonatal development were recorded and compared among three groups. **Results:** The pregnancy success rate of groups A, B, C was 89.3%, 70.9% and 92.8%, respectively, which was significantly lower in group B than in other groups ( $P < 0.05$ ). There was no significant difference ( $P > 0.05$ ) of delivery gestational week of the newborns among the three groups. Full-term birth weight and body length among the three groups had no significant difference ( $P > 0.05$ ). Comparison of newborn birth weight and body length with normal reference standards showed no significant difference ( $P > 0.05$ ). **Conclusion:** Paternal lymphocyte induced immunization or induced immunization combined with dydrogesterone can significantly improve the pregnancy outcome of URSA compared with only given oral dydrogesterone alone. All the three methods had no adverse effect on the occurrence of both perinatal complication and growth of newborns.

**Key words:** unexplained recurrent spontaneous abortion (URSA); dydrogesterone; paternal lymphocyte *in vitro* induced immunization

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# 不同类型子宫畸形及手术治疗对生育能力及妊娠结局的影响

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**【摘要】**目的: 研究不同类型子宫畸形及纵隔子宫手术治疗对生育能力、妊娠并发症及妊娠分娩结局的影响。方法: 将361例子宫畸形分类进行对比分析, 并对58例纵隔子宫进行术前、术后对比研究。结果: 单角子宫组的不孕症发生率、早产率、胎位异常率、胎儿宫内发育受限率及围产儿死亡率均高于其它子宫畸形组( $P<0.05$ ), 纵隔子宫早期胎儿丢失率最高( $P<0.05$ )。纵隔子宫术后胎儿丢失率较术前下降( $P<0.05$ ), 而足月产率、出生体质量增高( $P<0.05$ )。结论: 单角子宫对妊娠及其结局影响较大, 纵隔子宫易导致早期胎儿丢失, 宫腔镜子宫纵隔电切术有助于改善妊娠与分娩结局。

**关键词:** 子宫畸形; 纵隔子宫; 单角子宫; 宫腔镜; 电切术

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## Effect of different types of uterine malformation and surgical therapy on fertility and pregnancy outcome

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**【ABSTRACT】 Objective:** To evaluate the effect of different types of uterine malformation and operation in hysteroscopy in woman on fertility and pregnancy outcome. **Methods:** A total of 361 women with congenital uterine malformation were compared according to different types. The pregnancy outcome of 58 women with septate uterus was compared between pre-operation and post-operation. **Results:** Uterine unicornis were associated with higher rates of the incidence of infertility, preterm delivery, abnormal fetal position, intrauterine growth retardation, and perinatal mortality ( $P<0.05$ ). The highest incidence of early spontaneous abortion was noted among women with septate uterus, and the fetal loss was significantly lower in women who conceived following hysteroscopic metroplasty, meanwhile the incidence of term delivery and birth weight were observed higher compared with women before treatment. **Conclusion:** Uterus unicornis was play a bad influence on the pregnancy outcome. Resection under hysteroscopy significantly improved pregnancy outcome in women of septate uterus with the fetal loss was easy to happen.

**Key words:** uterine malformation; septate uterus; uterus unicornis; hysteroscopy; resection



# 接受供精人工授精夫妇婚姻质量 及心理状况特征的研究

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**【摘要】**目的: 探讨接受供精人工授精(AID)夫妇婚姻质量及心理状况与夫精人工授精(AIH)夫妇及正常生育夫妇的差别。方法: 采用随机抽样病例对照研究, 对278对AID夫妇(AID组), 169对AIH夫妇(AIH组)及50对正常生育夫妇(对照组)进行问卷调查。调查内容包括: 一般情况, 抑郁自评量表(SDS)及焦虑自评量表(SAS)测量调查对象的心理状况, Olson-婚姻质量问卷(ENRICH)测量调查对象的婚姻质量。结果: ① AID组男方SAS评分及SDS评分显著高于对照组男方( $P<0.05$ ), 且AID组男方SDS评分显著高于AIH组男方; AID组女方SAS评分及SDS评分显著高于对照组女方( $P<0.05$ ), 且AID组女方SAS评分显著高于AIH组女方。② 在婚姻质量评分上, 婚姻满意度和夫妻交流的因子得分, AID组男女双方及AIH组男方均显著低于对照组( $P<0.05$ ), 而AIH组女方仅夫妻交流的因子得分低于对照组( $P<0.05$ ), 但AID组和AIH组间无统计学差异( $P>0.05$ )。③ 在抑郁发生率上, AID组男方(46.22%)显著高于AIH组男方(30.47%)及正常组男方(2.00%)( $P<0.05$ ), 但女方组无统计学差异( $P>0.05$ )。结论: AID夫妇和AIH夫妇与对照组相比, 存在较多的抑郁和焦虑情绪, 而且AID夫妇心理问题更为突出, 尤其是AID夫妇中的男方更多的处于抑郁状态; AID夫妇与AIH夫妇在婚姻质量上无差别, 但与正常夫妇相比存在一定程度婚姻质量的下降。

**关键词:** 供精人工授精(AID); 焦虑自评量表(SAS); 抑郁自评量表(SDS); 婚姻质量量表(ENRICH)

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## Research of marriage quality and mental status of couples received artificial insemination by donor

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**【ABSTRACT】 Objective:** To compare the marriage quality and mental status of couples treated by artificial insemination by donor (AID) with couples treated by artificial insemination by husband (AIH) and normal fertile couples (the control). **Methods:** This was a randomized controlled trial, in which 278 AID and 169 AIH couples as well as 50 normal fertile spouses were investigated by questionnaires. Participants completed the general condition questionnaires and self-administered questionnaires including self-rating depression scale (SDS) and self-rating anxiety scale (SAS) to access their mental status, and Olson marriage quality questionnaire (ENRICH) to access the quality of marital relationship. The investigation results were compared and analyzed in the experimental group and two control groups. **Results:** Infertile Chinese men in AID group scored significantly higher respectively on SAS and SDS than the fertile male controls ( $P<0.05$ ). AID males also scored significantly higher on SDS than the AIH male controls ( $P<0.05$ ). AID females scored significantly higher on SAS and SDS respectively than the fertile female controls ( $P<0.05$ ). It was found that the AID and AIH groups had no significant difference on marital quality, while both of them scored lower than the fertile controls on the marriage quality and communication factors. The depression incidence rate of AID males was 46.22%, which had a significant difference compared with that in AIH (30.47%) and normal fertile (2.00%) groups ( $P>0.05$ ). **Conclusion:** The infertile couples in AID and AIH groups had higher levels of anxiety and depression than those in couples of the control. The psychological problems are prominent in AID spouses, especially in the males. No significant differences were reported between AID and AIH couples for marital quality. Infertile couples show diminished marital quality in some respects compared with the normal fertile ones.

**Key words:** artificial insemination from donor (AID); self-rating anxiety scale (SAS); self-rating depression scale (SDS); Olson marriage quality questionnaire (ENRICH)

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• 循证医学 •

## 绝经激素治疗循证临床实践指南的系统评价

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**【摘要】**目的: 系统评价绝经激素治疗(MHT)循证临床实践指南。方法: 计算机检索PubMed、Web of Science、美国国家指南库(national guideline clearinghouse, NGC)、国际指南网(guideline international network, GIN)及新西兰指南组(New Zealand Guidelines Group, NZGG)、中国期刊全文数据库和万方数据库, 纳入MHT循证临床实践指南, 检索时限为2005~2015年, 采用指南研究与评价工具II (Appraisal of Guidelines for Research and Evaluation II, AGREE II)评价指南方法学质量。提取指南中MHT的主要药物雌激素(E)、孕激素(P)、E+P、替代药物替伯龙(Tibolone)和雷洛昔芬(Rolaxifene)对适用人群可能带来的利益、风险和使用方法, 并通过核对数据后制成清单。结果: 纳入的6篇指南整体质量较好, 其中5个指南的总体得分 $\geq 60\%$ , 仅北美绝经学会指南评分为58%。在范围和目的、参与人员、严谨性、清晰性、应用性、编辑独立性各领域的平均得分依次为81%、74%、67%、74%、53%、65%, 应用性领域平均得分最低(53%)。所有指南均强调MHT实践应注意个体化, 应充分考虑不同个体的生理情况, 评估MHT利益和风险, 同时需征求患者意愿。评估的内容包括对患者年龄、绝经类型及年限、绝经症状程度及MHT效用、MHT后心血管疾病及肿瘤风险、家族史等。5个指南推荐使用雌激素最低有效剂量缓解绝经期症状。结论: 纳入研究的6个MHT循证临床实践指南整体质量较好, 在MHT指南更新或制定新指南时应加强应用性领域的考虑。在MHT的临床实践中应体现个体化原则, 做好风险和利益评估工作。激素使用的剂量方面提倡个体化使用雌激素最低有效剂量缓解绝经期症状。

**关键词:** 绝经激素治疗(MHT); 循证临床实践指南; 指南评价工具II (AGREE II); 系统评价

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## System review of the evidence-based guidelines in menopause hormone therapy

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**【ABSTRACT】 Objective:** To systematically review the guidelines on menopause hormone therapy (MHT). **Methods:** PubMed, Web of Science, WanFang, CNKI, National Guideline Clearinghouse (NGC), Guidelines International (GIN) and New Zealand Guidelines Group Network (NZGG) were searched to collect evidence-based guidelines on MHT from May 2005 to May 2015. The quality of included guideline was assessed by the Appraisal of Guidelines for Research and Evaluation II (AGREE II) instrument. We extracted the benefits, risks and prescriptions of estrogen (E), progestogen (P), E+P, and alternative medicines such as Tibolone and Rolaxifene in guideline and made check-list for users by panel discussion. **Results:** The overall quality of included six guidelines was moderate. Among them, five scored  $\geq 60\%$ , only one scored 58%. “scope and purpose”, “stakeholder involvement”, “rigor of development”, “clarity and presentation”, “applicability” and “editorial independence” were scored 81%, 74%, 67%, 74%, 53%, 65%, respectively. The “applicability” domain got the lowest score (53%). All guidelines emphasize the individualization in MHT clinical practice. Individual physiological situation should be fully considered. It was essential to assess the MHT Benefits and risks, and ask for the willing of patients, including patient's age, type of menopause and the level of age, menopausal symptoms, the MHT utility after MHT and family history of cardiovascular disease and cancer risk, etc. Five guidelines recommend the lowest effective dose of E<sub>2</sub> to relieve menopausal symptoms. **Conclusion:** The quality of included guidelines is moderate. “Applicability” domain should be strengthened when update or development of new guidelines. MHT clinical practice should emphasize the individualization by assessment of risks and benefits. All guidelines recommend the lowest effective dose of E<sub>2</sub> to relieve menopausal symptoms.

**Key words:** menopause hormone therapy (MHT); evidence-based guideline; Appraisal of Guidelines for Research and Evaluation II (AGREE II); system review

• 综述 •

## 转录因子 C/EBP $\beta$ 在蜕膜化过程中的功能研究及进展

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**【摘要】** 转录因子 CCAAT 增强子结合蛋白  $\beta$  (CCAAT enhancer-binding protein $\beta$ , C/EBP $\beta$ ) 是一类与 DNA 增强子区域结合的反式作用因子。近年来研究表明 C/EBP $\beta$  在子宫中的表达参与了妊娠早期的胚胎发育和蜕膜化过程。C/EBP $\beta$  敲除小鼠表现为不孕和对蜕膜化刺激无反应, 说明 C/EBP $\beta$  是调节蜕膜化反应的一个重要调节因子。C/EBP $\beta$  调节蜕膜化过程中子宫内膜基质细胞的增殖和分化, 促进蜕膜化标志分子催乳素 (prolactin, PRL) 和胰岛素样生长因子结合蛋白 1 (insulin-like growth factor binding protein 1, IGFBP-1) 的表达。此外, C/EBP $\beta$  还可与蜕膜化相关的甾体激素、cAMP、FOXO1 等分子相互作用进而调节蜕膜化。本文综述了 C/EBP $\beta$  在调控蜕膜化过程的研究进展。

**关键词:** 蜕膜化; 转录因子 CCAAT 增强子结合蛋白  $\beta$  (C/EBP $\beta$ ); 基质细胞

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## Function and progression of CCAAT enhancer-binding protein $\beta$ during the process of decidualization

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**【ABSTRACT】** The transcription factor CCAAT enhancer binding protein beta (C/EBP $\beta$ ) is a transcription factor that combines with the DNA promoter region. Recent years, studies identified the expression of C/EBP $\beta$  in uterus as a novel mediator of embryonic development and decidualization. Female mice lacking C/EBP $\beta$  gene are infertile and their uteri displayed a complete lack of response to a decidualogenic stimulus, indicating a critical role of this transcription factor in regulating the decidualization program. C/EBP $\beta$  involves in endometrial stromal cell proliferation and differentiation during decidualization, and promotes the expression of insulin-like growth factor binding protein 1 (IGFBP-1) and prolactin (PRL). Besides, C/EBP $\beta$  regulates decidualization via interacting with many other molecules participating in decidualization, such as hormones, cAMP and forkhead transcription factors of the Oclass 1 (FOXO1). In this paper, the regulation of C/EBP $\beta$  in the uterine decidualization was reviewed.

**Key words:** decidualization; transcription factor CCAAT enhancer binding protein beta (C/EBP $\beta$ ); stromal cells

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# 瘦素-受体系统与多囊卵巢综合征 相关性的研究

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**【摘要】** 多囊卵巢综合征(polycystic ovary syndrome, PCOS)是一种发病呈多因性、临床表现呈多态性的内分泌紊乱综合征,其发病机制至今尚未阐明。瘦素(leptin, Lep)是由肥胖基因编码的一个重要的脂肪因子,可作为体内代谢信号参与下丘脑-垂体-卵巢轴的调节。Lep水平与肥胖密切相关,而PCOS患者又多伴有肥胖等代谢异常症状。目前文献综合表明,不同来源的临床资料反映的结果存在不协调之处,因而不能断定Lep与受体变化是否构成PCOS病因。不同Lep基因突变的PCOS动物模型可以反映某些特异PCOS症状,为今后人们阐明Lep系统在PCOS的病因学中的作用,以及探索其基因在诊断和治疗PCOS方面的临床价值提供参考。

**关键词:** 瘦素(Lep); 多囊卵巢综合征(PCOS); 临床调查; 动物模型

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## Review on the correlation of leptin/leptin receptor system and polycystic ovary syndrome

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**【ABSTRACT】** Polycystic ovary syndrome (PCOS) is an endocrine disorder with a variety of etiological factors and clinic manifestations, but its pathogenesis is still unclear. Leptin, an adipocyte-derived hormone encoded by *ob* gene, serves as a link relaying metabolic signals to the neuronal networks in the brain, to modulate hypothalamus-pituitary-ovarian axis. Circulating leptin correlates strongly with obesity, which is frequently associated with PCOS. Summarizing from current literatures, we found that inconsistent results were mainly due to different sources of clinical data, and so concluded that the changes in leptin and its receptor possibly constituted the etiology of PCOS. Then, leptin and leptin receptor gene related PCOS models were summarized, suggesting different animal models reflect some specific PCOS symptoms individually in aid to elucidation on the roles of leptin system in the etiology of PCOS, and providing a reference for the exploration to the clinical value for diagnosis and treatment of PCOS.

**Key words:** leptin (Lep); polycystic ovary syndrome (PCOS); clinical investigation; animal models

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# 子宫内膜容受性的超声评估方法研究进展

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**【摘要】**许多因素影响体外受精-胚胎移植(IVF-ET)结局, 重要因素在于胚胎质量和子宫内膜容受性。子宫内膜容受性的评价指标有很多。简便、可重复、无创伤的经阴道超声为评估子宫内膜容受性提供可能, 目前比较公认的观点是子宫内膜厚度 $<8$  mm时, 子宫内膜容受性明显下降, 且不存在子宫内膜厚度上限值, 子宫内膜容积 $<2.0\sim 2.5$  ml阴性预测价值较强, 子宫内膜血流灌注可在一定程度上预测子宫内膜容受性, 但现有的研究结果尚不能得到一个合适的评价标准, 有待于不断地探索总结。

**关键词:** 内膜容受性; 超声; 体外受精-胚胎移植(IVF-ET)

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## Recent study progress of endometrial receptivity by ultrasound

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**【ABSTRACT】** Many factors influence the results of *in vitro* fertilization-embryo transfer (IVF-ET), while the significant factors are embryo quality and endometrial receptivity. There are many evaluation indexes for endometrial receptivity. Transvaginal ultrasound examination is easy, repeatable and non-invasive, which can evaluate endometrial receptivity. It has been shown that the endometrium thickness <8 mm can't achieve a good endometrial receptivity. There is no threshold for endometrial thickness which a pregnancy is unlikely to occur. The use of minimal endometrial volume 2.0 ml to 2.5 ml mainly lies in the high negative predictive value. A good blood supply towards the endometrium is usually considered as an essential requirement for good endometrial receptivity. The existing researches still can't get a good evaluation standard, which need further studies.

**Key words:** endometrial receptivity; ultrasound; *in vitro* fertilization-embryo transfer (IVF-ET)

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• 临床报道 •

## 体外受精胚胎细胞数量和碎片比例 对囊胚形成的影响

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**【摘要】**目的: 探讨体外受精(IVF)周期中胚胎细胞数量和碎片比例对囊胚形成的影响。方法: 回顾性分析2404个IVF周期患者的13037个进行囊胚培养的胚胎。根据第3日细胞数量将胚胎分为2~3-细胞组(2C~3C)、4-细胞组(4C)、5-细胞组(5C)、6-细胞组(6C)、7-细胞组(7C)、8-细胞组(8C)、9-细胞组(9C)、10-细胞组(10C)、11-细胞组(11C)、12-细胞组(12C)、 $\geq 13$ -细胞组( $\geq 13$ C), 分析囊胚培养细胞数量和碎片比例与囊胚形成的关系。结果: 碎片为1~2级的胚胎, 8C组和 $\geq 13$ C组囊胚形成率明显高于其他各组( $P < 0.05$ ); 7C、9C~12C组之间囊胚形成率无统计学差异( $P > 0.05$ )。碎片为3级的胚胎, 8C组的囊胚形成率高于其他各组( $P < 0.05$ ), 且与碎片1~2级7C、9C~12C组的胚胎相比无统计学差异( $P > 0.05$ ); 9C组囊胚形成率高于7C组, 且差异显著( $P < 0.05$ )。结论: 第3日8C胚胎的发育潜能是最优的, 可适当放宽对8C碎片的评估; 随着碎片比例增大可减弱胚胎的发育潜能。

**关键词:** 辅助生殖技术(ART); 体外受精(IVF); 囊胚培养; 细胞数量; 碎片比例

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## Influence of cell number and fragment to blastula formation during *in vitro* fertilization-embryo transfer treatment

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**【ABSTRACT】 Objective:** To investigate the influence of cell number and fragment in day 3 embryo to blastula formation through blastocyst culture. **Methods:** Totally 13 037 embryos from 2 404 IVF treatment cycles were collected retrospectively. Blastocyst formation were observed till day 6 by blastocyst culture. According to the cell number in each embryo, the embryos were divided into 11 groups, which were 2-3-cell (2C-3C), 4-cell (4C), 5-cell (5C), 6-cell (6C), 7-cell (7C), 8-cell (8C), 9-cell (9C), 10-cell (10C), 11-cell (11C), 12-cell (12C),  $\geq 13$ -cell ( $\geq 13$ C) groups. The relationship of blastocyst formation and fragment ratio to cell number was analyzed. **Results:** When the fragment grade was below 2, the blastula formation rate in 8C group and  $\geq 13$ C group was significantly higher than that in other groups ( $P < 0.05$ ); there were no differences among 7C and 9C-12C groups ( $P > 0.05$ ). When the fragment grade was 3, the blastula formation rate in 8C group was significantly higher than that in other groups ( $P < 0.05$ ) and no significant differences were found among 7C and 9C-12C groups in fragment grade 2 ( $P > 0.05$ ); the blastula formation rate in 9C group was higher than that in 7C group ( $P < 0.05$ ). **Conclusion:** 8C embryo in day 3 had the best potentiality of development, and the fragment ratio can influence the development potential.

**Key words:** assisted reproductive technology (ART); *in vitro* fertilization (IVF); cell number; fragment ratio

# 子宫内膜异位症腹腔液IL-6及在位子宫内膜蛋白基因代谢产物9.5与疼痛的关系

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**【摘要】**目的: 探讨子宫内膜异位症(endometriosis, EMs)在位内膜中的神经纤维蛋白基因产物9.5(protein gene product 9.5, PGP9.5)及腹腔液白介素(IL)-6的表达及与EMs疼痛的关系。方法: 选取住院行腹腔镜手术的EMs患者60例, 分为无痛组27例[视觉模拟法(VAS)评分为0]和疼痛组33例(VAS评分>0), 其中疼痛组分为轻度疼痛9例, 中度疼痛10例, 重度疼痛14例。并与同期行腹腔镜手术的35例子宫肌瘤患者(子宫肌瘤组)进行对比研究。通过检测EMs组和子宫肌瘤组患者腹腔液IL-6及在位子宫内膜PGP9.5, 进行疼痛相关性分析。结果: 腹腔液IL-6含量EMs组显著高于子宫肌瘤组( $P<0.01$ ); 其中EMs患者中疼痛组高于无痛组( $P<0.01$ ), 重度疼痛组高于轻、中度疼痛组( $P<0.05$ ), PGP9.5阳性率表达EMs组显著高于子宫肌瘤组( $P<0.01$ ), 其中EMs患者中疼痛组高于无痛组( $P<0.01$ )。结论: EMs疼痛与腹腔液IL-6及子宫在位内膜PGP9.5的含量有一定的关联性, 两者可能是EMs患者的疼痛原因之一。

**关键词:** 子宫内膜异位症(EMs); 白介素(IL)-6; 神经纤维; 蛋白基因产物9.5(PGP9.5); 疼痛

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## Relationship between peritoneal fluid of IL-6 combined with the expression of protein gene product 9.5 in eutopic endometrium and the pain symptom in endometriosis

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**【ABSTRACT】 Objective:** To investigate the relationship of peritoneal fluid of interleukine (IL)-6 and the expression of protein gene product 9.5 (PGP9.5) in eutopic endometrium with the pain symptom of endometriosis (EMs) patients. **Methods:** Sixty EMs patients were divided into 33 cases with pain, which included 9 cases with mild pain, 10 cases with moderate pain and 14 cases with severe pain, 27 cases without pain according to the visual analogue scale method (VAS). Thirty-five patients with uterine fibroids were selected as control group. Peritoneal fluid was collected during the laparoscopy, all was stored for subsequent analysis of IL-6. Endometrial biopsy was obtained and immunohistochemistry was performed using the pan-neuronal marker PGP9.5. **Results:** The content of IL-6 in EMs patients was obviously higher than that of control cases with uterine fibroids ( $P<0.01$ ). The content of IL-6 in pain group was obviously higher than that in without pain patients ( $P<0.01$ ), and also in severe pain group it was significantly higher than that in mild pain group and moderate pain group ( $P<0.01$ ). The positive rate of PGP9.5 expression in EMs group was obviously higher than that in control cases with uterine fibroids ( $P<0.01$ ). The positive rate of PGP9.5 expression in pain group was obviously higher than that in without pain patients ( $P<0.01$ ). **Conclusion:** The pain symptom in EMs had some relationship with expression of PGP9.5 and peritoneal fluid of IL-6, which may be one of the reasons causing the pain in EMs, and it is needed further study.

**Key words:** endometriosis (EMs); interleukin (IL)-6; protein gene product 9.5 (PGP9.5); pain

# 精液分析区域性外部质量控制研究

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**【摘要】**目的: 探讨精液分析区域性外部质量控制实践中参评实验室检测结果的准确性和结果的可比性。方法: 制作2个水平的精子浓度、活动率和正常形态率的质控品发放给参评实验室进行外部质量控制测试, 分析质控结果。评价指标为均值和实验室间变异系数(CV)。结果: 精子浓度、前向运动精子百分率(PR)和正常形态精子百分率(NR)CV分别为34.09%、24.96%和62.01%; 各实验室精子浓度、PR结果差异均无统计学意义( $P>0.05$ ), NR差异有统计学意义( $P<0.05$ )。结论: 外部质控结果CV较大, 尤其正常形态精子的检测结果, 提示技术人员亟需进行规范培训, 开展标准化精液分析质量控制活动, 提高分析结果的重复性和准确性。

**关键词:** 精液分析; 区域性外部质量控制; 平均变异值; 变异系数(CV)

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## Regional external quality control for semen analysis

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**【ABSTRACT】 Objective:** To explore the accuracy and comparability of results of the participating laboratories during regional external quality control (QC) for semen analysis. **Methods:** The QC samples were prepared and distributed to the participating laboratories for the external quality control testing. The mean value and the average coefficient of variation (CV) of sperm concentration, progressive motility rate (PR), normal morphology rate (NR) were compared. **Results:** The average CV among laboratories for the sperm concentration, PR and NR were 34.09%, 24.96% and 62.01%, respectively. There was no significant difference for the sperm concentration, progressive motility among the laboratories ( $P>0.05$ ), except for the normal morphology ( $P<0.05$ ). **Conclusion:** The CVs for the three parameters were higher, especially for the normal morphology. There is an urgent need of regular standardized training for laboratory technicians to improve the results of semen analysis of repeatability and accuracy.

**Key words:** semen analysis; regional external quality control; mean variation; coefficient of variation (CV)

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· 个案报道 ·

## 超声检查在辅助生殖技术(ART)典型并发症中的研究应用

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**【摘要】**目的: 探讨超声检查在辅助生殖技术(assisted reproductive technology, ART)治疗后发生典型并发症诊疗中的应用价值。方法: 对经ART治疗后发生1例重度卵巢过度刺激综合征(ovarian hyperstimulation syndrome, OHSS)合并双侧卵巢破裂出血、1例单侧输卵管双胎妊娠和1例超促排卵妊娠五胞胎病例进行超声检查分析研究。结果: 1例重度OHSS卵巢破裂急性出血在超声图像上无特征性表现, 主要是呈多房性的卵巢出血处组织局部迅速膨大, 内部回声杂乱无章, 边界不清, 卵巢周围出现游离无回声。1例单侧输卵管双胎妊娠超声显示增粗的输卵管内2个孕囊。1例超促排卵妊娠五胞胎超声显示子宫内5个孕囊及胚芽。结论: ART时严格掌握促排卵尤其超促排卵助孕的合理应用, 控制胚胎移植的数量, 加强超声检查, 检测卵泡发育, 预测OHSS程度, 及早检出宫外孕和多胎妊娠, 以期母婴安全。

**关键词:** 超声; 辅助生殖技术(ART); 并发症

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## Application of ultrasound in the typical complications during assisted reproductive technology (ART)

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**【ABSTRACT】 Objective:** To explore the ultrasound value in diagnosis and treatment for the typical complications of assisted reproductive technology (ART). **Methods:** After treatment with ART, severe ovarian hyperstimulation syndrome (OHSS) combined bilateral ovarian rupture and hemorrhage, unilateral tubal twin pregnancies and quintuplet pregnancy after super-stimulate ovulation was analyzed and researched. **Results:** Severe OHSS combined bilateral ovarian rupture and hemorrhage had no distinguishing features in ultrasonic images. The main images were ovarian enlarging with multi-separate at bleeding sites, the hemorrhage mass had mess echo, boundary obscure, and there was free echoless around the ovarian, twin pregnancy in unilateral fallopian tube showed there were two gestation sacs in the tube, quintuplet pregnancy after super-stimulate ovulation showed 5 gestation sacs and embryos. **Conclusion:** In order to ensure the safety of maternal and child, ART should be strictly applied to stimulate ovulation, especially in super-stimulate ovulation and limit the number of embryos transferred. The ultrasound examination should be strengthened.

**Key words:** ultrasound; assisted reproductive technology (ART); complications