

• 实验研究 •

## βB2晶状体蛋白对小鼠卵巢发育 及动情周期的影响

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**【摘要】**目的: 初步探讨βB2晶状体蛋白(Crybb2)参与调节生殖过程的作用机制。方法: 选取11~13周龄βB2基因敲除(KO组, n=19)与野生型C57BL/C(WT组, n=23)雌性小鼠, 阴道涂片观察动情周期变化; HE染色观察卵巢病理变化; 光学显微镜下计数卵巢最大切面原始卵泡、初级卵泡、闭锁卵泡; Western blotting和免疫组织化学确定βB2晶状体蛋白在卵巢组织中的表达与定位。结果: βB2晶状体蛋白主要表达在WT组小鼠卵巢颗粒细胞内。与WT组小鼠相比, KO组小鼠卵巢相对重量减轻, 动情周期紊乱, 原始卵泡、初级卵泡减少, 闭锁卵泡增多。结论: βB2基因敲除小鼠的动情周期及卵巢发育异常, βB2晶状体蛋白对小鼠卵巢的发育有重要影响。

**关键词:** βB2晶状体蛋白(Crybb2); 动情周期; 卵巢发育

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## Effect of $\beta$ B2 Crystallin on Ovary Development and Estrous Cycle of Mouse

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**【ABSTRACT】 Objective:** To explore the effects and mechanism of  $\beta$ B2-crystallin (Crybb2) in mouse ovary development and estrous cycle. **Methods:** Adult (11–13 weeks)  $\beta$ B2 gene knockout (KO group,  $n=19$ ) and wild-type (WT group,  $n=23$ ) female C57BL/C mice were used. Estrous cycle was determined through vaginal smear. HE staining was used to examine the effects of  $\beta$ B2 crystallin on the ovary tissue. The number of primordial, primary and atresic follicles was counted by using paraffin sections under optical microscope in the largest ovarian cross-section. Expression of  $\beta$ B2 crystallin in mouse ovary was assayed by Western blotting and immunohistochemistry. **Results:** The ovary weight in  $\beta$ B2 gene knockout mice reduced and demonstrated an irregular estrous cycle compared with WT group. The follicular atresia was increased, while the number of primordial and primary follicles was reduced in  $\beta$ B2 gene knockout mouse ovary. Expression of  $\beta$ B2 crystallin was mainly expressed in granulosa cells of WT mice, not in  $\beta$ B2 gene knockout mice. **Conclusion:**  $\beta$ B2 gene knockout mice displayed ovarian dysplasia, suggesting that  $\beta$ B2 crystallin may play an important role in regulation of ovary development of mice.

**Key words:**  $\beta$ B2 crystallin (Crybb2); estrous cycle; ovary development

# 卵巢早衰患者外周血 CD4<sup>+</sup>CD25<sup>+</sup>Treg 细胞的变化及意义

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**【摘要】**目的: 探讨 CD4<sup>+</sup>CD25<sup>+</sup> 调节性 T 细胞(即 CD4<sup>+</sup>CD25<sup>+</sup>Treg 细胞)在卵巢早衰发病机制中的作用。方法: 流式细胞仪定量检测卵巢早衰(premature ovarian failure, POF)患者、卵巢储备功能下降(diminished ovarian reserve, DOR)患者及健康对照组外周血 CD4<sup>+</sup>T、CD8<sup>+</sup>T 细胞及 CD4<sup>+</sup>CD25<sup>+</sup>Treg 细胞数量, 应用 <sup>3</sup>H-thymidine 掺入法测定 POF 患者及对照组外周血 CD4<sup>+</sup>CD25<sup>+</sup>Treg 细胞对效应性 T 细胞的增殖抑制功能。结果: 与对照组相比, POF 患者及 DOR 患者 CD4<sup>+</sup>CD25<sup>+</sup>Treg 细胞比例降低( $P < 0.01$ )、POF 患者 CD4<sup>+</sup>T/CD8<sup>+</sup>T 细胞比值增高( $P < 0.05$ ), DOR 患者 CD4<sup>+</sup>T/CD8<sup>+</sup>T 细胞比值无明显变化( $P > 0.05$ ); POF 患者免疫抑制功能无明显降低( $P > 0.05$ )。结论: CD4<sup>+</sup>CD25<sup>+</sup>Treg 细胞比例降低与 T 细胞亚群失衡可能是 POF 的发病机制。

**关键词:** 卵巢早衰(POF); 卵巢储备功能下降; CD4<sup>+</sup>CD25<sup>+</sup> 调节性 T 细胞(CD4<sup>+</sup>CD25<sup>+</sup>Treg 细胞); T 淋巴细胞亚群

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## Changes and Significances of CD4<sup>+</sup>CD25<sup>+</sup>T Regulatory Cells in Patients with Premature Ovary Failure

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**【ABSTRACT】 Objective:** To explore the role of T lymphocyte subsets and CD4<sup>+</sup>CD25<sup>+</sup>T regulatory cells (CD4<sup>+</sup>CD25<sup>+</sup>Treg cells) in the pathogenesis of premature ovary failure (POF). **Methods:** Flow-cytometry analysis of CD4<sup>+</sup>T, CD8<sup>+</sup>T cells and CD4<sup>+</sup>CD25<sup>+</sup>Treg cells was performed on fresh peripheral blood in patients with POF ( $n=26$ ), diminished ovarian reserve (DOR,  $n=19$ ) and control group, the suppression function of CD4<sup>+</sup>CD25<sup>+</sup>Treg cells in POF group and the control were detected by <sup>3</sup>H-thymidine experiment. **Results:** Compared with the control, the percentages of CD4<sup>+</sup>CD25<sup>+</sup>Treg cells in POF group and DOR group were obviously reduced ( $P<0.01$ ), and the CD4<sup>+</sup>T/CD8<sup>+</sup>T ratio in POF group was significantly increased ( $P<0.05$ ); but in DOR group, there was no significant difference; however the suppression function of CD4<sup>+</sup>CD25<sup>+</sup>Treg cells in POF group was not significantly decreased ( $P>0.05$ ). **Conclusion:** The decreased CD4<sup>+</sup>CD25<sup>+</sup>Treg cells and the imbalance of T lymphocyte subsets may play an important role in the pathogenesis of POF.

**Key words:** premature ovary failure (POF); diminished ovarian reserve (DOR); CD4<sup>+</sup>CD25<sup>+</sup>Treg cells; T lymphocyte subsets

• 临床研究 •

## 梗阻性无精子症患者精子顶体完整性与 卵胞质单精子注射治疗结局之间的关系

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**【摘要】**目的:探讨梗阻性无精子症(OA)患者精子的顶体完整性(AI)及其与卵胞质单精子注射(ICSI)治疗临床结局之间的关系。方法:选取梗阻性无精子症患者共37例为试验组,同期进行体外受精治疗且精液常规参数正常的男性33例为对照组,应用荧光标记的豌豆凝集素法(PSA-FITC)检测精子顶体完整性,巴氏染色法分析精子形态,比较试验组与对照组的顶体完整率(AIR)、正常形态率(NFR)、受精率(FR)、卵裂率(CR)及优质胚胎率(OER),并将AIR与FR、NFR与FR进行相关性分析。结果:试验组的AIR、NFR、FR显著低于对照组( $P<0.01$ ),CR、OER试验组与对照组相比无统计学差异( $P>0.05$ )。试验组AIR与FR呈显著正相关( $r=0.595, P<0.01$ ),NFR与FR显著正相关( $r=0.463, P<0.01$ );对照组AIR与FR显著正相关( $r=0.683, P<0.01$ ),NFR与FR呈显著正相关( $r=0.205, P<0.01$ )。结论:梗阻性无精子症患者的精子AIR较低。行皮下附睾抽吸术(PESA)-ICSI的梗阻性无精子症患者精子其AIR高则受精率也会高。

**关键词:** 梗阻性无精子症(OA);精子顶体完整性(AI);皮下附睾抽吸术(PESA);卵胞质单精子注射(ICSI)

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## Evaluation of Sperm Acrosome Integrity with Clinical Outcome after Intracytoplasmic Sperm Injection in Patients with Obstructive Azoospermia

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**【ABSTRACT】 Objective:** To evaluate the correlation between sperm acrosome integrity (AI) and fertilization rate after intracytoplasmic sperm injection (ICSI) of samples from patients with obstructive azoospermia. **Methods:** Thirty-seven obstructive azoospermia patients who received percutaneous epididymal sperm aspiration (PESA) undergoing ICSI were enrolled as test group and 33 semen samples from age-matched normospermic males were set as the control. These samples were assessed by AI and normal forms (NF). Acrosome integrity was detected by fluorescein-labeled pisum sativum agglutinin (PSA-FITC). Clinical outcomes in terms of fertilization rate (FR), cleavage rate (CR) and optimal embryo rate (OER) were evaluated concomitantly. Correlation analysis was assessed between AI rate (AIR) and FR in obstructive azoospermia group and control group respectively. The same analysis was evaluated between NF rate (NFR) and FR. **Results:** AIR, NFR and FR of test group were significantly lower than those of the control ( $P<0.01$ ). However, CR and OER showed no difference between test group and the control ( $P>0.05$ ). In addition, a positive correlation was found between AIR and FR ( $r=0.595$ ,  $P<0.01$ ) in the obstructive azoospermia group. Furthermore, a similar result was achieved between NFR and FR ( $r=0.463$ ,  $P<0.01$ ). In the control, meanwhile, AIR was positively correlated with FR ( $r=0.683$ ,  $P<0.01$ ). Moreover, a positive correlation was expected between NFR and FR ( $r=0.205$ ,  $P<0.01$ ). **Conclusion:** Males with obstructive azoospermia have poor AIR. When undergoing PESA-ICSI, these patients would obtain low FR. Epididymal sperm samples with high AIR could result in high FR while going through ICSI.

**Key words:** obstructive azoospermia (OA); acrosome integrity (AI); percutaneous epididymal sperm aspiration (PESA); intracytoplasmic sperm injection (ICSI)

## 3 106 个不同来源精子 ICSI 周期 临床妊娠结局分析

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**【摘要】**目的: 分析精子的来源对卵胞质内单精子注射(ICSI)治疗结局的影响。方法: 回顾性分析因男性不育行 ICSI 的 3 106 个新鲜周期, 按精子来源分为: 射精组(A组)、附睾穿刺取精(PESA)组(B组)、睾丸精子抽吸(TESA)组(C组)、冻融 PESA 精子组(D组)及冻融 TESA 精子组(E组), 比较各组 ICSI 后胚胎发育及妊娠结局情况。结果: C组 2PN 受精率、卵裂率显著低于 A组及 B组; B组临床妊娠率、胚胎植入率显著高于 A组及 C组, A组、B组及 C组间分娩率、异位妊娠率、流产率及新生儿畸形率无统计学差异( $P>0.05$ ); E组 2PN 受精率显著低于 D组, 但 B组与 D组之间、C组与 E组间 2PN 受精率、优质胚胎率、多胎率、流产率及异位妊娠率均无统计学差异( $P>0.05$ )。结论: PESA/TESA-ICSI、冻融 PESA/TESA 精子技术是治疗梗阻性无精子症安全有效的方法, 建议首先选择附睾取精, 并可将剩余 PESA/TESA 精子冻存。

**关键词:** 卵胞质内单精子显微注射(ICSI); 经皮附睾穿刺取精术(PESA); 睾丸精子抽吸术(TESA); 冻融精子; 临床结局

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## Clinical Outcome Analysis of 3 106 Intracytoplasmic Sperm Injection Cycles Using Spermatozoa of Different Origin

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**【ABSTRACT】 Objective:** To analyze the effect of sperm origin on pregnancy outcome after intracytoplasmic sperm injection (ICSI). **Methods:** A retrospective study was carried out on 3 106 fresh cycles which had undergone ICSI treatment. Patients were divided into five groups according to the source of sperm: ejaculated sperm group (group A), percutaneous epididymal aspiration (PESA) group (group B), testicular sperm aspiration (TESA) group (group C), frozen-thawed epididymal sperm group (group D) and frozen-thawed testicular sperm group (group E). The embryonic development and pregnancy outcomes and other indicators were compared. **Results:** The rates of 2PN fertilization and cleavage were significantly higher in group A and group B than in group C. The rates of clinical pregnancy and embryo implantation were significantly higher in group B than in group A and group C. There was no significant difference among groups A, B, C in the rates of good-quality embryo, parturition, ectopic pregnancy, single fetal birth, multiple birth, miscarriage and neonatal malformation. The rate of 2PN fertilization was significantly higher in group D than in group E. There was no significant difference between groups D and E in the rates of 2PN fertilization, good-quality embryo, ectopic pregnancy and multiple birth and miscarriage. **Conclusion:** PESA/TESA-ICSI and ICSI using frozen-thawed sperm from PESA/TESA are effective methods to treat obstructive azoospermia, while PESA should be the first choice, and the rest of sperm from PESA/TESA should be cryopreserved.

**Key words:** intracytoplasmic sperm injection (ICSI); percutaneous epididymal sperm aspiration (PESA); testicular sperm aspiration (TESA); frozen-thawed sperm; clinical outcomes



# 微刺激促排卵在IVF/ICSI卵巢低反应患者中的应用

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**【摘要】**目的: 探讨微刺激促排卵在IVF/ICSI卵巢低反应患者中的应用。方法: 回顾性分析进行IVF/ICSI助孕的卵巢低反应患者共114个周期, 根据用药情况分为3组: A组(来曲唑组, 34个周期), B组(克罗米芬组, 41个周期), C组(短方案组, 39个周期)。比较3组患者的一般情况、Gn使用天数及总量、IVF相关指标及助孕结局。结果: ①年龄、体质量指数(BMI)、不孕年限、基础内分泌水平组间比较均无统计学差异( $P>0.05$ )。②A组Gn使用天数及总量、hCG注射日 $E_2$ 水平、优质胚胎率低于C组( $P<0.05$ ); hCG注射日LH水平、提前排卵率高于C组( $P<0.05$ ); 平均获卵数、受精率、卵裂率、着床率、临床妊娠率A组与C组间比较均无统计学差异( $P>0.05$ )。③B组Gn使用天数及总量、hCG注射日 $E_2$ 水平、平均获卵数、卵裂率均低于C组( $P<0.05$ ); hCG注射日LH水平高于C组( $P<0.05$ ); 提前排卵率、受精率、优质胚胎率、着床率、临床妊娠率B组与C组间均无统计学差异( $P>0.05$ )。④B组Gn使用天数及总量高于A组( $P<0.05$ ); 其余相关指标组间比较均无统计学差异( $P>0.05$ )。结论: 微刺激方案可以获得与GnRH-a短方案相近的临床效果, 同时降低Gn使用总量, 减轻患者单周期治疗费用, 是卵巢储备功能低下患者较理想的促排卵方案。

**关键词:** 体外受精-胚胎移植(IVF-ET); 微刺激; 卵巢低反应; 克罗米芬(CC); 来曲唑(LE)

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## Application of Mild-stimulation Ovulation in IVF/ISCI Patients with Poor Ovarian Response

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**【ABSTRACT】 Objective:** To explore the application of mild-stimulate ovulation in *in vitro* fertilization and embryo transfer (IVF-ET) among patients with poor ovarian response. **Methods:** Retrospective analysis of IVF/ICSI poor ovarian response patients with a total of 114 cycles was performed. According to the difference of the ovarian stimulation, patients were divided into 3 groups: group A (letrozole group, LE group, 34 cycles), group B (clomiphene citrate group, CC group, 41 cycles), group C (short protocol group, 39 cycles). The general situation of the patients, Gn dosage and period, indicators associated with IVF lab and clinical outcomes in the 3 groups were compared. **Results:** 1) Age, body mass index (BMI), infertility duration, the basis of endocrine were not statistically different ( $P>0.05$ ) in 3 groups. 2) Gn dosage and treatment period,  $E_2$  level on hCG injection day and excellent embryo rate in group A were lower than those in group C ( $P<0.05$ ); LH level on hCG injection day and ahead of ovulation rate in group A were higher than those in group C ( $P<0.05$ ); average number of oocyte retrieved, fertilization rate, cleavage rate, implantation rate, clinical pregnancy rate were not significantly different between the groups ( $P>0.05$ ). 3) Gn dosage and treatment period,  $E_2$  level on hCG injection day, the average number of oocyte retrieved and cleavage rate in group B were lower than those in group C ( $P<0.05$ ); LH level on hCG injection day in group B was higher than that in group C ( $P<0.05$ ); ahead of ovulation rate, fertilization rate, the rate of excellent embryos, implantation rate, clinical pregnancy rate were not significantly different between the two groups ( $P>0.05$ ). 4) Gn dosage and treatment period in group B were higher than those in group A ( $P<0.05$ ); other indicators between group A and group B were not significantly different ( $P>0.05$ ). **Conclusion:** The mild-stimulation ovulation protocol can be used to obtain similar clinical effects as GnRH-a short protocol, while it could reduce the Gn dosage and the cost of treatment. It may be the ideal protocol for poor ovarian response patients in IVF.

**Key words:** *in vitro* fertilization and embryo transfer (IVF-ET); mild-stimulation; poor ovarian response; clomiphene (CC); letrozole (LE)

# 中学生接触媒体性相关信息情况及其 对性与生殖健康知识的影响

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**【摘要】目的:**了解中学生接触不同类型媒体性相关信息的情况及其对性与生殖健康知识的影响。**方法:**在上海市某区6所中学随机抽取1403名中学生进行匿名电子问卷调查。**结果:**调查对象平均每日接触各类媒体的时间中位数和四分位数间距分别为190.2 min和107.1~342.9 min, 其中在网络上花费时间最多;对象从不同媒体获取过性相关信息的比例不同, 排在前3位的媒体是电视、电影、网络, 获取的性相关信息主要为生理卫生知识, 其次为处理恋爱/婚姻/家庭关系;19%左右的调查对象接触过色情信息。多因素分析结果显示, 从电视、电影或网络获取过性相关信息、接触过色情信息的调查对象, 其性与生殖健康知识得分较高;电视、电影或网络对中学生性与生殖健康知识的影响程度仅次于学校性教育;从小说/书/期刊/杂志、报纸获取过性相关信息与对象性与生殖健康知识之间无统计学关联。**结论:**电视、电影或网络是中学生获取性与生殖健康知识的重要途径, 也是中学生性与生殖健康知识水平的影响因素。

**关键词:**中学生; 媒体; 性相关信息; 生殖健康; 性知识

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## Exposure to Sex-related Information in Mass Media among Middle School Students and Its Impact on Their Sexual and Reproductive Health Knowledge

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**【ABSTRACT】 Objective:** To assess the sex-related information in different types of mass media among middle school students and its impact on their sexual and reproductive health knowledge. **Methods:** A total of 1 403 junior and senior high school students from 6 middle schools in one of Shanghai's districts were randomly sampled, and anonymous electronic questionnaire survey was conducted. **Results:** The median and interquartile of mass media exposure time among respondents were 190.2 min/d and 107.1–342.9 min/d, of which the internet accounted for the highest amount. Respondents had access to sex-related information from different media. The top three media were TV, movies and the internet, the main information from which respondents had access to was reproductive health knowledge, followed by dealing with love, marriage and family relationship. About 19% of the respondents had exposed to porn information. Multivariate analysis showed that respondents who had access to sex-related information from TV, movies, internet and exposed to porn information had a higher sexual and reproductive health knowledge score. Second to school's sex education, TV, movies or the internet had an important influence on middle school students' sexual and reproductive health knowledge. Respondents' exposure to sex-related information in novels, books, journals, magazines and newspapers was not significantly associated with their sexual and reproductive health knowledge. **Conclusion:** TV, movies or the internet were important ways for middle school students to get sexual and reproductive health knowledge, also were influential factors for their levels of sexual and reproductive health knowledge.

**Key words:** middle school students; mass media; sex-related information; reproductive health;  
sexual knowledge

# 南京城区宫颈疾病女性性功能障碍调查研究

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**【摘要】**目的: 了解宫颈疾病女性性功能障碍(female sexual dysfunction, FSD)患病率及危险因素。方法: 采用回顾性调查方法, 对在南京医科大学附属南京妇幼保健院宫颈科门诊就诊的18~55岁有正常性生活女性进行问卷调查。取宫颈脱落细胞, 采用PCR和膜杂交方法, 检测出21种常见人乳头瘤病毒(human papillomavirus, HPV)中任何一种HPV亚型即为HPV阳性。通过宫颈专科医生常规妇科检查获知女性所患宫颈疾病。应用女性性功能指数(female sexual function index, FSFI)问卷对受访者近1个月的性生活状况进行调查, 采用多因素非条件Logistic回归分析影响FSD的宫颈疾病。结果: 发放调查问卷共2 045份, 472例拒绝, 1 573例接受问卷调查, 去除不合格问卷458份, 有效问卷1 115份, 有效率71%。1 115例女性研究对象中宫颈疾病患者占43.6%(486/1 115)。486例宫颈疾病患者中, 性功能障碍者占52.3%(254/486)。在FSD组中, 患有宫颈疾病者显著多于宫颈正常者, 差异有统计学意义( $P<0.01$ )。宫颈疾病组的性欲、性唤起、阴道润滑、性高潮、性满意、性疼痛等各项性功能评分值均低于宫颈正常组( $P<0.05$ )。多因素非条件Logistic回归分析表明: 宫颈息肉( $OR=1.57$ , 95%CI=1.01~2.45)、宫颈糜烂( $OR=1.74$ , 95%CI=1.23~2.45)、宫颈肥大( $OR=2.26$ , 95%CI=1.33~3.84)、宫颈上皮内瘤变(cervical intraepithelial neoplasia, CIN)( $OR=2.95$ , 95%CI=2.13~4.08)是FSD的独立危险因素。危险度大小依次是: CIN>宫颈肥大>宫颈糜烂>宫颈息肉。结论: 南京城区FSD在宫颈疾病专科门诊中发病率颇高, 有必要加强性保健宣传, 促使有宫颈疾病者定期进行生殖系统健康体检, 形成良好的性生活方式, 从而降低FSD发病率。

**关键词:** 宫颈疾病; 女性性功能障碍(FSD); 女性性功能指数(FSFI); 调查研究

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## Investigation of Female Sexual Dysfunction in Patients of Cervical Disease in Nanjing City

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**【ABSTRACT】 Objective:** To investigate the incidence and risk factors of female sexual dysfunction (FSD) in patients of cervical disease. **Methods:** A retrospective survey on women aged 18–55 years old with normal coitus in the cervical out-patients of Maternity and Child Health Hospital Affiliated to Nanjing Medical University was conducted. Different HPV genotypes were detected in cervical exfoliated cells by the method of PCR and membrane of the hybrid. Any type of HPV which had been detected can be seen as HPV positive. The cervical specialists through conventional gynecological examination learned women who suffered from cervical disease. Female sexual function index (FSFI) questionnaire was applied to assess sex condition in nearly a month. Multiple Logistic regression analysis was used to analyze independent risk factors. **Results:** In the 2 045 copies of the questionnaires, 472 cases were refused, and 458 cases were removed. Totally, 1 573 subjects completed the questionnaires and 1 115 (71%) valid questionnaires that met the criteria were finally included for analysis. There were 486 (43.6%) women with cervical disease in 1 115 patients. There were 254 (52.3%) cases who have sexual dysfunction in patients with cervical disease. The results had a significant difference between cervical disease group and normal group. The score of patients reduced in sexual desire, sexual arousal, vaginal lubrication, orgasm, sexual satisfaction and sexual pain ( $P < 0.05$ ). Multivariate Logistic regression analysis showed that cervical polyp ( $OR = 1.57$ , 95%CI = 1.01–2.45), cervical erosion ( $OR = 1.74$ , 95%CI = 1.23–2.45), cervical hypertrophy ( $OR = 2.26$ , 95%CI = 1.33–3.84), cervical intraepithelial neoplasia ( $OR = 2.95$ , 95%CI = 2.13–4.08) were independent risk factors of FSD. Risk factors in order were as follows: CIN > cervical hypertrophy > cervical erosion > cervical polyp. **Conclusion:** In Nanjing city, the FSD incidence is high in out-patients of cervical disease. It is necessary to strengthen promotion of sexual health, implement regular physical examination of reproductive system and form a good sexual life to reduce the FSD incidence.

**Key words:** cervical disease; female sexual dysfunction (FSD); female sexual function index (FSFI); investigation

· 综述 ·

## 卵子线粒体老化——辅助生殖技术面临的瓶颈

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**【摘要】** 卵子老化是辅助生殖失败的一个重要原因。目前, 许多妇女生育年龄不断推迟, 导致卵子老化问题日益严重。线粒体是细胞中提供能量的重要细胞器, 体细胞衰老与线粒体功能异常密切相关。由于线粒体是卵子/胚胎中数量最多的细胞器, 推测线粒体功能的损伤可能在卵子老化、受精成功率和体外胚胎发育方面, 也起到重要作用。本文根据前人的研究成果, 阐述了线粒体在卵子成熟、受精以及胚胎发育过程中的作用, 分析了线粒体老化对卵子质量和受精胚胎发育的影响, 证明提高卵母细胞中线粒体功能, 对提高卵母细胞/体外受精胚胎的质量具有重要的意义。

**关键词:** 线粒体; 卵子老化; 辅助生殖

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## **Oocyte Mitochondrial Aging —— Bottleneck of Assisted Reproductive Technology (ART)**

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**【ABSTRACT】** “Oocyte aging” is an important cause for IVF failure and poor embryo quality. At present, many women delay their pregnancy to the later part of their childbearing years which makes “oocyte aging” a more important etiology for infertility. Mitochondrial dysfunction is associated with somatic cells senescence. Because mitochondria are the most abundant organelles in oocytes/embryos, we speculate that mitochondrial dysfunction may have an important role in oocyte maturation, fertilization and embryo development too. In this article, we have reviewed the function of mitochondria during oocyte maturation, fertilization and the following embryo development. Techniques improving mitochondrial function in the oocytes could not only prevent the oocyte aging process, but also improve the quality of embryos from assisted reproductive technology (ART).

**Key words:** mitochondria; oocyte aging; assisted reproductive technology (ART)



# 控制性超促排卵中卵巢低反应诊断标准研究进展

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**【摘要】** 控制性超促排卵中卵巢低反应是困扰临床医生的一个难题, 目前国内外对卵巢低反应的诊断标准尚未达成共识。本文将从年龄、生殖发育调节因子、促性腺激素(Gn)用量、hCG注射日优势卵泡数、窦卵泡数及获卵数等方面对控制性超促排卵中卵巢低反应诊断标准进行综述。

**关键词:** 卵巢低反应; 超排卵; 诊断标准

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## Research and Development for the Diagnostic Criteria of Poor Ovarian Response to Controlled Ovarian Hyperstimulation (COH) for *in Vitro* Fertilization

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**【ABSTRACT】** Poor ovarian response (POR) to controlled ovarian hyperstimulation is a problem that plagued clinicians. Currently, it has not yet reached a consensus on the diagnostic criteria of POR. In the present article, the scientific background of the issue is summarized the criteria of POR to COH in the following outline: the age, the reproductive and developmental regulatory factors, the dose of gonadotrophins (Gn), the number of dominant follicle on hCG injection day, the number of antral follicles and retrieved oocytes, and so on.

**Key words:** poor ovarian response (POR); controlled ovarian hyperstimulation (COH); diagnostic criteria

# β2糖蛋白 I 在生殖过程中的作用 及机制研究进展

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**【摘要】** β2糖蛋白 I(β2GP I)系血浆中富含的一种由 326 个氨基酸残基组成的高度糖基化蛋白, 包含 5 个结构域, 具有优先结合带负电荷磷脂类的特性。β2糖蛋白 I 参与脂代谢, 是多种脂蛋白的组成成分; 参与血液凝固过程, 具有抗凝和促凝双重活性。近年研究表明, β2糖蛋白 I 作为一种生理性蛋白在生物生殖发育中发挥着重要的作用, 能够提高精子活力、清除凋亡小体, 对精子的生成和颗粒细胞增殖具有调节作用, 与妊娠结局密切相关。

**关键词:** β2糖蛋白 I(β2GP I); 生殖; 发育; 研究进展

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## Research Advances in the Roles and Mechanisms of $\beta$ 2-glycoprotein I in Reproduction and Development

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**【ABSTRACT】** Beta 2-glycoprotein I ( $\beta$ 2GP I) is a highly glycosylated plasma protein comprised of 326 amino acids, contains 5 structural domains, with the ability to preferentially bind negatively charged phospholipids.  $\beta$ 2GP I is involved in lipoprotein metabolism, it is the component of various lipoproteins. In addition, it is also involved in blood coagulation processes, with the dual activity of anticoagulation and pro-coagulation. Recent studies have suggested that  $\beta$ 2GP I as a physiological protein plays an important role in reproduction and development. It has the ability to stimulate sperm motility, clear apoptotic bodies, regulate the spermatogenesis and mitotic proliferation of granulosa cells, thus it is related with pregnancy outcomes closely.

**Key words:** beta 2-glycoprotein I ( $\beta$ 2GP I); reproduction; development; research advances

• 临床报道 •

## 手术剥除子宫内膜异位囊肿 对IVF-ET结局的影响

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**【摘要】**目的: 探讨子宫内膜异位囊肿手术剥除与否对IVF-ET结局的影响。方法: 回顾性分析接受IVF-ET第1周期治疗的305例患者, 分成子宫内膜异位囊肿手术组(A组)、子宫内膜异位囊肿未手术组(B组)和管性不孕对照组(C组), 采用长、短方案进行超促排卵, 比较3组的IVF结局。结果: 无论刺激方案如何, A组平均获卵数低于B组与C组( $P \leq 0.001$ ), 而FSH用量高于C组( $P < 0.001$ ), A组妊娠率低于B组, B组妊娠率低于C组( $P < 0.05$ )。B组与C组相比, 除FSH用量较高( $P < 0.001$ )外, 获卵数、总胚胎数、优质胚胎率、可利用胚胎数3组间比较无统计学差异。此外, 在A组中, 手术侧卵巢平均获卵数低于健侧卵巢( $P < 0.01$ ), 且术侧卵巢未获卵的比例达24%。结论: 子宫内膜异位囊肿患者IVF结局不良; 手术剥除子宫内膜异位囊肿并不能改善IVF结局, 反而降低了卵巢反应性。

**关键词:** 子宫内膜异位症(EMs); 子宫内膜异位囊肿; 体外受精-胚胎移植(IVF-ET); 囊肿剥除术

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## Effect of Surgical Treatment for Endometrioma on *In Vitro* Fertilization-Embryo Transfer Outcomes

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**【ABSTRACT】 Objective:** To investigate the effect of endometrioma and stripping endometrioma on IVF-ET outcomes. **Methods:** A total of 305 cases receiving the first IVF cycle in our center were included in this retrospective study. They were divided into three groups, endometrioma-operated group, endometrioma group, tubal infertility group as the control. All these patients were divided into 2 subgroups according to different ovarian hyperstimulation protocols (long protocol and short protocol). The outcomes of IVF were compared among the three groups. **Results:** In both protocols, the average number of retrieved oocytes in endometrioma-operated group was lower than that of endometrioma group and tubal infertility group ( $P \leq 0.001$ ). The endometrioma-operated group was also consuming significantly higher doses of FSH than that of the control ( $P < 0.001$ ). Meanwhile, the pregnancy rate of endometrioma-operated group was lower than that of endometrioma group, the pregnancy rate of both the two groups was lower than that of the control ( $P < 0.05$ ). Compared with the control, the endometrioma group consumed higher FSH dosage ( $P < 0.001$ ), but the average number of retrieved oocytes and total number of embryos were comparable between the two groups. The three groups had no significant difference in the rate of good-quality embryos. In addition, in the endometrioma-operated group, the average number of retrieved oocytes from the operated ovaries was lower than that from the contralateral ovaries ( $P < 0.01$ ), 24% of these patients did not retrieve eggs. **Conclusion:** Patients with endometrioma have poorer IVF outcomes, and surgical treatment for endometrioma cannot improve the IVF outcome, but to aggravate the damage to ovarian response.

**Key words:** endometriosis; endometrial cyst; IVF-ET; enucleation

# 多囊卵巢综合征(PCOS)患者在IVF-ET中发生严重卵巢过度刺激综合征(OHSS)的特点分析

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**【摘要】**目的: 通过总结 IVF-ET 中多囊卵巢综合征 (PCOS) 患者应用控制性超促排卵 (COH) 后发生卵巢过度刺激综合征 (OHSS) 的特点, 提出防止中、重度 OHSS 发生的有效措施。方法: 将 IVF/ICSI 治疗时出现中、重度 OHSS 的患者根据有无 PCOS 史分成 PCOS 组和对照组。比较分析 PCOS 组和对照组在 COH 中的雌激素水平、卵泡数、取卵数及发生中、重度 OHSS 的时间等临床资料; 分析妊娠对 OHSS 的影响。结果: PCOS 组的 Gn 用药总量及 hCG 注射日的血清 E<sub>2</sub> 水平比对照组低, 其总卵泡数、中小卵泡数明显高于对照组, 发生中、重度 OHSS 的时间早, 妊娠可能加重 OHSS 病情发展。结论: 卵泡总数、中小卵泡数可作为 PCOS 患者预测中、重度 OHSS 独立的重要指标, 建议即使取卵前 E<sub>2</sub> 水平不高、获卵数不多也考虑行全胚冷冻, 以阻止严重的 OHSS 发生。

**关键词:** 多囊卵巢综合征 (PCOS); 控制性超促排卵 (COH); 中小卵泡数; 全胚冷冻

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## Analysis of Serious OHSS in PCOS Patients during IVF-ET

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**【ABSTRACT】 Objective:** To retrospectively analyze the characteristics of ovarian hyperstimulation syndrome (OHSS) in polycystic ovarian syndrome (PCOS) patients undergoing hormonal stimulation during IVF/ICSI in order to provide measurement to prevent serious OHSS. **Methods:** The patients with medium and serious OHSS undergoing IVF/ICSI were collected and divided into PCOS group and the control. Serum E<sub>2</sub>, follicular number, oocyte number, OHSS time, and the effect of pregnancy on OHSS were compared between the two groups. **Results:** The total dosage of Gn used and serum E<sub>2</sub> level on hCG injection day were lower in PCOS group than in the control, and the follicle number was higher in PCOS group than in the control, the OHSS occurred much earlier in PCOS group and pregnancy can aggravate it. **Conclusion:** The follicle number, medium and small follicle number can prognose medium and serious OHSS in PCOS patients, suggesting that even no high E<sub>2</sub> level and high oocyte number, freezing all embryos may be still associated with the prevention of serious OHSS.

**Key words:** polycystic ovarian syndrome (PCOS); IVF; controlled ovarian hyperstimulation (COH); medium and small follicles; freeze all embryo



• 现场调查 •

## 北流市已婚育龄夫妇不孕症调查分析

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**【摘要】**目的: 了解北流市育龄妇女人群不孕的发病情况、病因及高危因素。方法: 采用整群抽样方法, 在北流市随机抽取44个行政村, 以其中18~49岁的已婚育龄妇女为调查对象, 对已婚育龄夫妇作不孕症筛查、不孕症危险因素调查、体检和妇科检查。结果: 在发放的21 824份问卷中, 共收到21 239份调查问卷, 有效率为97.32%。不孕症患病率为1.28%, 其中原发性不孕率为0.71%(115/21 239), 继发性不孕率为0.57%(121/21 239); 输卵管梗阻、精液异常是不孕的主要因素。结论: 要加强对育龄夫妇的生殖健康教育, 提倡适龄结婚生育, 不宜过多吸烟、饮酒, 在接触有毒有害物质时要采取防护措施, 注意防治盆腔感染等。

**关键词:** 不孕; 育龄妇女; 患病率; 危险因素

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## Investigation on Infertility Rate among Couples at Reproductive Age in Beiliu City

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**【ABSTRACT】 Objective:** To explore the prevalence rate of infertility and related risk factors in women at reproductive age. **Methods:** Forty-four villages from Beiliu city were randomly selected using cluster sampling method. All women aged 18–49 years old were investigated and examined. **Results:** A total of 21 239 questionnaires were obtained, the usable rate was 97.32%. The prevalence rate of infertility was 1.28%. The primary infertility rate was 0.71% (115/21 239) and the secondary infertility rate was 0.57% (121/21 239). Obstruction of fallopian tube and abnormal sperm quality were the main reasons for infertility. **Conclusion:** Reproductive health education should be implemented to couples at reproductive age. Conception at appropriate age, no drinking and smoking, and taking protective measures to prevent from exposing to toxic and harmful substances should be advocated.

**Key words:** infertility; women at reproductive age; prevalence rate; risk factors

· 个案报道 ·

## 卵子发育障碍原发性不孕姐妹2例

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**【摘要】**目的: 报道2例IVF治疗中卵子发育障碍原发性不孕姐妹患者。方法: 对本院收治的2例卵子发育障碍原发性不孕患者姐妹进行回顾性总结与分析。结果: 均采用常规GnRHa长方案促排卵, 取卵日卵泡穿刺镜检仅见卵丘颗粒细胞团, 均未见到卵子, 补救性hCG治疗亦未取得卵子, 诊断为卵子发育异常。追问病史得知其祖父母为表兄妹近亲婚配。患者(妹妹)行受卵治疗, 宫内单胎成功妊娠。结论: 门诊IVF治疗建病历时应详细询问患者家族史, 供卵方案是目前IVF治疗卵子发育障碍原发性不孕较常用且有效的方法。

**关键词:** 原发性不孕; 卵子发育障碍; 辅助生殖; 胚胎

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## Primary Infertility for Oocyte Developmental Disorders of Two Sister-cases

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**【ABSTRACT】 Objective:** To report two sister-cases of primary infertility for oocyte developmental disorders. **Methods:** A retrospective clinical study was performed to analyze two sister-cases of oocyte developmental disorders. **Results:** Two sister-cases underwent outpatient ovulation induction by conventional GnRHa protocol. There were only cumulus granulosa cell clusters without oocytes through microscopic examination on retrieval day. Oocytes were also not obtained by remedial hCG treatment. Thus oocyte dysplasia could be diagnosed. Subsequently it was acquired that their grandparents were cousin consanguineous marriages. Younger sister-patient with donor oocyte cycle surgery got successful pregnancy of intrauterine single fetal. **Conclusion:** The family and medical history should be asked in detail for IVF treatment. Donor scheme for oocyte developmental disorders is a feasible and effective option.

**Key words:** primary infertility; oocyte developmental disorders; assisted reproductive technology (ART); embryo