

中华生殖与避孕杂志[®]



原刊名《生殖与避孕》

CHINESE JOURNAL OF REPRODUCTION AND CONTRACEPTION

月刊 1980年12月创刊 第40卷 第6期 2020年6月25日出版

主 管

中国科学技术协会

主 办

中华医学会
上海市计划生育科学研究所
复旦大学附属妇产科医院

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《中华医学杂志》社有限责任公司
100710,北京市东四西大街42号
电话(传真):(010)51322059
Email:office@cmaph.org

广告发布登记号

京东市监广登字20170015号

印 刷

上海商务联西印刷有限公司

发 行

范围:公开
国内:中国邮政集团公司
上海分公司
国外:中国国际图书贸易集团
责任有限公司
(北京399信箱,100044)
代号 BM 389

订 购

全国各地邮政局
邮发代号4-928

邮 购

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

定 价

每期20.00元,全年240.00元

中国标准连续出版物号

ISSN 2096-2916

CN 10-1441/R

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本期责任编辑 乔杰

本期责任编辑 王李艳

本期责任排版 张蔚森

CHINESE JOURNAL OF REPRODUCTION AND CONTRACEPTION

(Original title: *Reproduction and Contraception*)

Monthly

Established in December 1980

Volume 40, Number 6

June 25, 2020



Responsible Institution

China Association for Science and Technology

Sponsor

Chinese Medical Association, Shanghai Institute of Planned Parenthood Research, Obstetrics and Gynecology Hospital of Fudan University

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http://zhshzybyzz.yiigle.com
http://www.medline.org.cn

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Chinese Medical Journals Publishing House Co., Ltd.
42 Dongsi Xidajie, Beijing 100710, China
Tel(Fax):0086-10-51322059
Email:office@cmaph.org

Printing

Business Book Printing Shop Shanghai Printing Co., LTD

Overseas Distributor

China International Book Trading Corporation
P.O. Box 399, Beijing 100044, China
Code No.M389

Mail-Order

Editorial Board of Chinese Journal of Reproduction and Contraception
779 Laohumin Road, Shanghai 200237, China
Tel: 0086-21-64438169
Fax: 0086-21-64438975
Email: randc@sippr.org.cn

CSSN

ISSN 2096-2916
CN 10-1441/R

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DOI : 10.3760/cma.j.cn101441-20190506-00183

收稿日期 2019-05-30 本文编辑 李天琦

引用本文 : 王琳琳, 郭薇, 杨蕊, 等. 促性腺激素释放激素激动剂联合重组人绒毛膜促性腺激素双扳机在体外受精卵母细胞低成熟率患者中的应用[J]. 中华生殖与避孕杂志, 2020, 40(6): 439-446. DOI: 10.3760/cma.j.cn101441-20190506-00183.

·临床研究·

促性腺激素释放激素激动剂联合重组人绒毛膜促性腺激素双扳机在体外受精卵母细胞低成熟率患者中的应用

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【摘要】 目的 探讨体外受精-胚胎移植 (*in vitro* fertilization and embryo transfer, IVF-ET) 拮抗剂方案中促性腺激素释放激素激动剂(GnRH-a)联合重组人绒毛膜促性腺激素(r-hCG)双扳机在改善卵巢正常反应但低卵母细胞成熟率患者临床结局的有效性。方法 回顾性分析 2016 年 3 月至 2017 年 8 月期间在北京大学第三医院妇产科生殖医学中心进行控制性超促排卵 (COH) 实施 IVF/卵母细胞内单精子显微注射(ICSI)的 366 例卵巢正常反应患者的临床资料, 并分为 3 组: A 组为卵巢正常反应患者在周期单独使用 r-hCG 扳机后卵母细胞成熟率低并且助孕失败者($n=123$); B 组为 A 组患者再次 COH 助孕采用拮抗剂方案并且使用 r-hCG(250 μ g)联合 GnRH-a(0.2 mg)扳机的周期($n=123$); C 组为 B 组患者同期的卵巢正常反应患者使用拮抗剂方案并单独使用 r-hCG 扳机的 COH 周期($n=120$)。结果 患者一般情况、基础激素水平、促性腺激素(Gn)使用总量及使用时间各组间差异均无统计学意义($P>0.05$)。B 组较 A 组的 ICSI 受精率(90.4% 比 83.8%, $P<0.001$)、MII 卵率 (77.6% 比 44.7%, $P<0.001$)、优质胚胎数 [(1.6 \pm 0.6)枚比 (0.3 \pm 0.3) 枚, $P=0.01$]、移植胚胎数[(1.8 \pm 0.8)枚比 (0.6 \pm 0.4) 枚, $P=0.02$]、新鲜周期的临床妊娠率(35.5% 比 0%, $P<0.001$)及活产率(31.8% 比 0%, $P<0.001$)、解冻周期的临床妊娠率(32.1% 比 0%, $P<0.001$)及活产率(28.0% 比 0%, $P<0.001$)均显著升高, 并且其周期取消率明显降低(10.6% 比 27.6%, $P<0.001$)。B 组与 C 组相比, 其获卵数差异无统计学意义, 双原核(2PN)胚胎数[(5.0 \pm 2.8)枚比 (6.3 \pm 3.8)枚, $P=0.03$]、优质胚胎数[(1.6 \pm 0.6)枚比 (4.0 \pm 2.6) 枚, $P=0.02$]、新鲜周期的临床妊娠率(35.5% 比 58.0%, $P<0.001$)及活产率(31.8% 比 46.8%, $P=0.02$)、解冻周期的临床妊娠率(32.1% 比 51.3%, $P=0.01$)及活产率(28.0% 比 44.4%, $P=0.03$)均显著降低。结论 对于卵巢正常反应但低卵母细胞成熟率患者使用拮抗剂方案同时使用 GnRH-a 联合 r-hCG 双扳机可提高卵母细胞质量及胚胎质量, 增加优质胚胎数、胚胎移植数及临床妊娠率, 改善临床妊娠结局。

【关键词】 联合扳机; 促性腺激素释放激素拮抗剂; 卵母细胞成熟; 卵巢正常反应; 促性腺激素释放激素激动剂

基金项目 : 国家自然科学基金 (81873833、81550022)

Co-administration of gonadotropin-releasing hormone agonist and recombinant-human chorionic gonadotropin in patients with low proportion of mature oocytes during *in vitro* fertilization treatment

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【Abstract】 Objective To evaluate the effectiveness of gonadotropin-releasing hormone agonist (GnRH-a) combined with recombinant-human chorionic gonadotropin (r-hCG) trigger (dual trigger) in improving the low proportion of mature oocytes in ovarian normal responders in GnRH antagonist cycles. **Methods** Retrospective study was performed to compare the stimulation characteristics of 366 *in vitro* fertilization/intracytoplasmic sperm injection (IVF/ICSI) cycles between March 2016 and August 2017 in Reproductive Medical Science Center of Obstetrics & Gynecology Department, Peking University Third Hospital. Patients were divided into group A (normal ovarian responders who were triggered with r-hCG only during IVF treatment resulted in low proportion of mature oocytes and failure IVF attempt, n=123), group B (dual trigger group, n=123), and group C (different patients of the corresponding period from group B, triggered with r-hCG only, n=120). The general characteristics and treatment outcomes were compared among these three groups. **Results** The basic characteristic data including age, assisted reproductive technology (ART) indications, duration of infertility, basal hormonal level among the three groups were not statistically significant ($P>0.05$). The ICSI fertilization rate (90.4% vs. 83.8% , $P<0.001$), and the rate of metaphase-II (MII) oocyte in group B was significantly higher than that in group A (77.6% vs. 44.7% , $P<0.001$). In addition, patients in group B had a significantly higher number of high-quality embryos (1.6 ± 0.6 vs. 0.3 ± 0.3 , $P=0.01$) , the number of embryos transferred (1.8 ± 0.8 vs. 0.6 ± 0.4 , $P=0.02$), the clinical pregnancy rate (35.5% vs. 0% , $P<0.001$) and the live birth rate (31.8% vs. 0% , $P<0.001$) in the fresh embryo transfer cycle , the clinical pregnancy rate (32.1% vs. 0% , $P<0.001$) and the live birth rate (28.0% vs. 0% , $P<0.001$) in the frozen-thawed embryo transfer cycle while lower rate of cycle cancellation (10.6% vs. 27.6% , $P<0.001$) than group A. As compared with group C, the number of oocytes retrieved was not statistically significant, while the number of high-quality embryos (1.6 ± 0.6 vs. 4.0 ± 2.6 , $P=0.02$), the number of two pronucleus (2PN) embryos (5.0 ± 2.8 vs. 6.3 ± 3.8 , $P=0.03$) and the clinical pregnancy rate (35.5% vs. 58.0% , $P<0.001$) and the live birth rate (31.8% vs. 46.8% , $P=0.02$) in the fresh embryo transfer cycle , the clinical pregnancy rate (32.1% vs. 51.3% , $P=0.01$) and the live birth rate (28.0% vs. 44.4% , $P=0.03$) in the frozen-thawed embryo transfer cycle were significantly lower. **Conclusion** For patients who have normal ovarian response but low proportion of mature oocytes, co-administration of GnRH-a and standard-dose r-hCG (dual trigger) for final oocyte maturation can improve their IVF outcome.

【 Key words 】 Dual trigger ; Gonadotropin-releasing hormone antagonist ; Oocyte maturation ; Normal ovarian responders ; Gonadotropin-releasing hormone agonist

Fund program : National Natural Science Foundation of China (81873833, 81550022)

DOI : 10.3760/cma.j.cn101441-20200421-00231

收稿日期 2020-04-21 本文编辑 宋培培

引用本文 : 陈华, 鲁南, 杨岳州, 等. 剖宫产切口瘢痕以及憩室对体外受精-胚胎移植后妊娠结局的影响[J]. 中华生殖与避孕杂志, 2020, 40(6): 447-453. DOI: 10.3760/cma.j.cn101441-20200421-00231.

·临床研究·

剖宫产切口瘢痕以及憩室对体外受精-胚胎移植后妊娠结局的影响

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【摘要】 目的 探讨前次剖宫产后子宫切口瘢痕以及憩室对体外受精-胚胎移植 (*in vitro* fertilization-embryo transfer, IVF-ET) 妊娠结局的影响。方法 回顾性分析 2014 年 1 月至 2018 年 1 月期间在复旦大学附属妇产科医院上海集爱遗传与不育诊疗中心接受单囊胚冻融胚胎移植 (frozen-thawed embryo transfer, FET) 且有一次分娩史的患者临床资料。按照分娩方式分为经阴道分娩的顺产组(267 个周期)和剖宫产组(256 个周期)，并根据 B 超测量到的剖宫产组子宫切口不同愈合情况，进一步分为 3 个亚组，分别为瘢痕不显著亚组、瘢痕亚组和瘢痕憩室亚组。分析有无剖宫产史以及剖宫产子宫瘢痕切口愈合不良程度对 FET 周期的妊娠结局的影响。结果 单囊胚 FET 周期中顺产组和剖宫产组患者的年龄、体质指数(BMI)、子宫内膜厚度差异均无统计学意义 (P 均 >0.05)。剖宫产组的胚胎种植率、临床妊娠率和活产率分别为 48.05%、46.48%和 38.28%，显著低于顺产组 (58.05%， $P=0.023$ ；56.93%， $P=0.014$ ；51.31%， $P=0.022$)；早产率在剖宫产组是 13.26%，显著高于顺产组 (1.46%， $P<0.001$)；分娩孕周亦提示剖宫产组[(38.12 \pm 1.76)周]显著低于顺产组[(39.02 \pm 1.37)周， $P<0.001$]；新生儿体质量在剖宫产组[(3 372.14 \pm 374.25) g]也显著低于顺产组[(3 438.82 \pm 337.30) g， $P=0.023$]；另外，根据剖宫产后瘢痕严重程度将剖宫产组进一步分组后显示：与顺产组相比，子宫瘢痕亚组的胚胎种植率、临床妊娠率、活产率和分娩孕周均有显著降低 ($P=0.021$ 、 $P=0.026$ 、 $P=0.005$ 和 $P=0.009$)；而瘢痕憩室亚组则显示更受影响($P=0.004$ 、 $P=0.003$ 、 $P=0.004$ 和 $P<0.001$)，差异均有统计学意义。结论 有剖宫产史特别是剖宫产后子宫切口愈合不良显著影响胚胎种植率和临床妊娠率，影响 IVF-ET 的成功率，并且增加早产和低体质量新生儿出生的风险。

【关键词】 受精，体外； 单胚胎移植； 妊娠结局； 冻融胚胎移植周期； 剖宫产切口瘢痕憩室

Impact of post-cesarean scar defects and scar diverticulum on the clinical outcomes of *in vitro* fertilization-embryo transfer

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【Abstract】 Objective To investigate the impact of post-cesarean scar defects and scar diverticulum on the clinical outcomes of *in vitro* fertilization-embryo transfer (IVF-ET). **Methods** A total of 523 cases, who had a previous delivery, underwent frozen-thawed single blastocyst transfer cycles during January 1st, 2014 to January 31st, 2018 in Shanghai Ji Ai Genetics and IVF Institute. Of which, 256 patients who had undergone cesarean section (C-S) surgery prior, along with 267 patients with a history of one vaginal delivery as control group, were admitted into this study. In addition, C-S group was further divided into 3 subgroups according to the different healing conditions of the uterine incision detected by ultrasound, namely, no severe defect subgroup, scar defects subgroup and diverticulum subgroup. The impact of patients with or without C-S history, patients with or without scar defects and diverticulum on the clinical outcomes of FET cycle was analyzed. **Results**

There was no difference in age, body mass index (BMI) and thickness of endometrium at the day of progesterone conversion between patients with one vaginal delivery (VD group) and patients with C-S history (C-S group). C-S group showed a significant decrease in implantation rate (48.05%), clinical pregnancy rate (46.48%) and live birth rate (38.28%) compared with VD group (58.05%, $P=0.023$; 56.93%, $P=0.014$; 51.31%, $P=0.022$). There was a significant rise in preterm delivery rate (13.26% vs. 1.46%, $P<0.001$), and average gestational age at the time of delivery was decreased [(38.12±1.76) weeks vs. (39.02±1.37) weeks, $P<0.001$], and neonatal birth weight was also significantly lower in C-S group [(3 372.14±374.25) g vs. (3 438.82±337.30) g, $P=0.023$]. Further analysis was done to address whether C-S severe defects with diverticulum had an impact on the clinical outcomes. Compared with the vaginal delivery group, the implantation rate, the clinical pregnancy rate, the live birth rate, and the gestational age at the time of delivery in severe scar defects subgroup were significantly reduced ($P=0.021$, $P=0.026$, $P=0.005$ and $P=0.009$); and in the scar diverticulum subgroup they were more affected ($P=0.004$, $P=0.003$, $P=0.004$ and $P<0.001$), the differences were statistically significant.

Conclusion A history of C-S, particularly a poor healing of incision with scar defects and diverticulum, has a significantly negative impact on the clinical outcomes of IVF-ET as well as a negative impact on gestational age at delivery, and increases the risk of premature birth and lower birth weight newborns.

【Key words】 Fertilization *in vitro* ; Single embryo transfer ; Pregnancy outcome ; Frozen-thawed embryo transfer; Cesarean scar defects

DOI : 10.3760/cma.j.cn101441-20190508-00185

收稿日期 2019-05-23 本文编辑 王李艳

引用本文 : 刘景, 孔红娇, 管一春, 等. 冷冻胚胎复苏周期胚胎移植策略的选择[J]. 中华生殖与避孕杂志, 2020, 40(6): 454-460.

DOI: 10.3760/cma.j.cn101441-20190508-00185.

·临床研究·

冷冻胚胎复苏周期胚胎移植策略的选择

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【摘要】 目的 初步探讨冷冻胚胎复苏周期中已冻存的低质量囊胚与高质量卵裂期胚胎的优先移植顺序。方法 回顾性分析了郑州大学第三附属医院生殖医学中心 2015 年 11 月至 2018 年 5 月期间 3677 个冻融胚胎移植(FET)周期的临床资料。根据移植胚胎发育时期、质量及移植胚胎数的不同分为 5 组 : 单非优质囊胚组(A 组)、单优质囊胚组(B 组)、第 3 日(D3)双优质胚胎组(C 组)、D3 优+非优质胚胎组(D 组)、D3 双非优质胚胎组(E 组)。每组再根据患者的年龄分为 3 个亚组 : <35 岁、35~37 岁和>37 岁。主要观察指标为活产率, 次要观察指标为临床妊娠率、植入率和多胎率。结果 D3 双胚胎移植组(C~E 组)植入率均显著低于单囊胚组(A、B 组)(P 均<0.05), 而多胎妊娠率均显著高于单囊胚组(P 均<0.01)。C 组与 A 组相比, 临床妊娠率差异无统计学意义($P>0.05$); 患者年龄<35 岁时, 活产率显著升高($P=0.003$), 35~37 岁组及>37 岁组活产率的差异无统计学意义。D 组与 A 组相比, 患者年龄<35 岁组及 35~37 岁组, 临床妊娠率及活产率差异均无统计学意义($P>0.05$); 患者年龄>37 岁时, 临床妊娠率显著降低($P=0.018$), 活产率降低, 但差异无统计学意义($P>0.05$)。E 组与 A 组相比, 所有年龄段的临床妊娠率、活产率均降低; 当患者年龄<35 岁及>37 岁时差异均有统计学意义($P<0.05$), 患者年龄为 35~37 岁时, 差异无统计学意义($P>0.05$)。

年龄和移植胚胎的种类均是活产的独立影响因素。调整年龄对活产的影响后,与 A 组相比, B 组 ($OR=1.311$, 95% $CI=1.083\sim 1.586$, $P=0.005$)、C 组 ($OR=1.322$, 95% $CI=1.092\sim 1.601$, $P=0.004$)、E 组 ($OR=0.616$, 95% $CI=0.468\sim 0.809$, $P=0.001$)对活产率的影响差异均有统计学意义,而 D 组 ($OR=1.139$, 95% $CI=0.914\sim 1.420$, $P=0.247$)对活产的影响程度与 A 组相比,差异无统计学意义。结论 综合考虑多胎妊娠及活产等因素,冷冻胚胎复苏周期最优的移植顺序可能是单优质囊胚>单非优质囊胚>D3 双优质胚胎>D3 优+非优质胚胎>D3 双非优质胚胎。

【关键词】 冻融胚胎移植; 移植策略; 活产; 临床妊娠

基金项目:河南省医学科技攻关计划项目(201602133)

Selection of embryo transfer strategies in frozen embryo transfer cycle

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【Abstract】 Objective To preliminarily explore the priority order of transfer of frozen low-quality blastocyst and high-quality cleavage embryos in the recovery frozen-thawed embryo transfer (FET) cycle of frozen embryos. **Methods** In this retrospective study, 3677 *in vitro* fertilization-embryo transfer (IVF-ET) cycles were reviewed in Reproductive Medicine Center of the Third Affiliated Hospital of Zhengzhou University from November 2015 to May 2018. According to the stage of embryo development, quality and number of embryos transferred, the embryos were divided into five groups: single-non-high-quality blastocyst group (group A), single-high-quality blastocyst group (group B), day 3 (D3) double-high-quality embryo group (group C), D3 high-quality plus non-high-quality embryo group (group D) and D3 double-non-high-quality embryo group (group E). According to the age of the patients, they were divided into three subgroups, <35 years old, 35-37 years old and >37 years old. The main observation indicator was live birth rate, and the secondary observation indicators were clinical pregnancy rate, implantation rate, and multiple birth rate. **Results** The implantation rates of double D3 embryos transfer groups (groups C-E) were significantly lower than those of single blastocyst groups (groups A and B)(all $P<0.05$), while the multiple pregnancy rates were significantly higher than those of single blastocyst groups (all $P<0.01$). There was no significant difference in clinical pregnancy rate between group C and group A ($P>0.05$). Live birth rate increased significantly when patients were younger than 35 years old ($P=0.003$), but there was no significant difference when patients were older than 35 years old. There was no significant difference in clinical pregnancy rate and live birth rate between group D and group A when patients were younger than 38 years old. When the patient was over 37 years old, the clinical pregnancy rate of group D was lower significantly ($P=0.018$), but there was no significant difference in the live birth rate ($P>0.05$). The clinical pregnancy rate and the live birth rate of group E were lower than those of group A. The difference was significant when the age of the patients was less than 35 years and more than 37 years (all $P<0.01$). There was no significant difference when the age of the patients was 35-37 years ($P>0.05$). Age and the type of embryos transferred were independent factors affecting live birth. After adjusting the effect of age on live birth, compared with group A, the effects of group B ($OR=1.311$, 95% $CI=1.083\sim 1.586$, $P=0.005$), group C ($OR=1.322$, 95% $CI=1.092\sim 1.601$, $P=0.004$), group E ($OR=0.616$, 95% $CI=0.468\sim 0.809$, $P=0.001$) on the live birth rate were significantly different, while the effects of group D ($OR=1.139$, 95% $CI=0.914\sim 1.420$, $P=0.247$) on the live birth rate was not significantly different from those of group A. **Conclusion** Considering multiple pregnancies and live births, the optimal transplantation sequence of frozen embryo transfer cycle may be single-high-quality blastocyst, single-non-high-quality blastocyst, D3 double-high-quality embryo, D3 high-quality plus non-high-quality embryo and D3 double-non-high-quality embryo.

【Key words】 Frozen-thawed embryo transfer; Transfer strategy; Live birth; Clinical pregnancy

Fund program: Henan Medical Science and Technology Research Project (201602133)

引用本文：周婷婷, 李敬, 于娜, 等. 子宫内膜微刺激受益的人群特征以及如何最大化这种效益：一项针对中国女性的回顾性病例对照研究[J]. 中华生殖与避孕杂志, 2020, 40(6): 461-468. DOI: 10.3760/cma.j.cn101441-20190912-00417.

·临床研究·

子宫内膜微刺激受益的人群特征以及如何最大化这种效益:一项针对中国女性的回顾性病例对照研究

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【摘要】 目的 找出可以受益于子宫内膜微刺激(endometrial microstimulation, EM)的体外受精/卵胞质内单精子注射(IVF/ICSI)患者特征以及如何最大化这种效果。方法 采用回顾性病例对照研究对2006年至2018年期间在山东大学生殖医学研究中心接受EM治疗的1916例患者资料进行分析。比较各个周期患者的基线特征、周期参数以及微刺激操作的各种差异。结果 患者年龄 ≤ 35 岁共1435个周期,其中种植成功共867个周期,种植失败共568个周期;患者年龄 > 35 岁共481个周期,其中种植成功共179个周期,种植失败共302个周期。年龄 ≤ 35 岁的女性中,种植成功者在扳机日子宫内膜厚度 $[(1.07 \pm 0.20) \text{ cm}]$ 大于种植失败者 $[(1.02 \pm 0.20) \text{ cm}, OR=5.01, P<0.001]$, A/A-型子宫内膜比例(91.3%)大于种植失败者(85.3%, $OR=1.88, P=0.01$)。对于年龄 > 35 岁的患者,种植成功者子宫内膜厚度 $[(1.05 \pm 0.19) \text{ cm}]$ 大于种植失败者 $[(0.96 \pm 0.22) \text{ cm}, OR=8.73, P<0.001]$;在黄体期进行EM患者的种植率(42.9%)大于卵泡期行EM者(32.7%, $P=0.02$)。结论 对于临床上被建议行EM治疗的患者,年龄 ≤ 35 岁子宫内膜状况较好(较厚或A/A-型子宫内膜)或者 > 35 岁子宫内膜较厚的患者可能可以从EM中获益,而且与卵泡期相比,黄体期内膜微刺激提高了 > 35 岁患者的胚胎种植率。

【关键词】 生殖技术, 辅助; 胚胎种植; 黄体期; 子宫内膜

Characteristics of patients who can benefit from endometrial microstimulation and how to maximize the efficacy: a retrospective case-control study of Chinese women

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【Abstract】 Objective To find out a specific group of patients undergoing *in vitro* fertilization/intracytoplasmic sperm injection (IVF/ICSI) who can benefit from endometrial

microstimulation (EM) and how to maximize the effect. **Methods** A retrospective case-control study on 1916 cycles from women who underwent EM in Center for Reproductive Medicine, Shandong University between 2006 to 2018. Their baseline characteristics and cycle parameters were analyzed as well as the differences in EM procedures. **Results** There were 1435 cycles from women ≤ 35 years old (867 succeeded in implantation and 568 failed) and 481 cycles from women >35 years old (179 succeeded in implantation and 302 failed). Among women ≤ 35 years old, compared with those who failed to implant, those who succeeded had thicker endometrium [(1.07 \pm 0.20) cm vs. (1.02 \pm 0.20) cm, $OR=5.01$, $P<0.001$] and a larger proportion of A/A- endometrial type (91.3% vs. 85.3%, $OR=1.88$, $P=0.01$) observed on trigger day. As for patients >35 years old, women who succeeded in implantation had thicker endometrium than those who failed in implantation [(1.05 \pm 0.19) cm vs. (0.96 \pm 0.22) cm, $OR=8.73$, $P<0.001$]. In addition, EM in luteal phase resulted in a significantly higher implantation rate in the >35 years old group compared with that when EM in follicular phase (42.9% vs. 32.7%, $P=0.02$). **Conclusion** As for patients who were suggested to do the EM therapy, those ≤ 35 years old with better endometrium condition (thicker and A/A- endometrial type) or women >35 years old with thicker endometrium may benefit from EM, and EM in luteal phase increases implantation rates among >35 -year-old patients compared with that when EM in follicular phase.

【Key words】 Reproductive technology, assisted ; Embryo implantation ; Luteal phase ; Endometrium

DOI : 10.3760.cma.j.cn101441-20190318-00104

收稿日期 2019-07-27 本文编辑 王李艳

引用本文 : 赵华, 张宇晖, 李蕾, 等. 玻璃化冷冻和程序化冷冻方法保存猕猴卵巢组织的存活效果比较[J]. 中华生殖与避孕杂志, 2020, 40(6): 469-475. DOI: 10.3760.cma.j.cn101441-20190318-00104.

·实验研究·

玻璃化冷冻和程序化冷冻方法保存猕猴卵巢组织的存活效果比较

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【摘要】 目的 探讨玻璃化冷冻和程序化冷冻对猕猴卵巢组织的冷冻保存效果。方法 取新鲜的猕猴卵巢组织随机分成对照组(新鲜卵巢组织)、玻璃化冷冻组和程序化冷冻组, 分别进行 HE 染色、窦前卵泡的分类计数及免疫染色, 比较 3 组卵巢组织内卵泡形态学、各级卵泡正常率及磷酸化组蛋白 H3(PHH3)的表达量的差异。结果 ①HE 染色: 3 组中, 始基卵泡、初级卵泡正常率差异均无统计学意义(P 均 >0.05); 程序化冷冻组单层次级卵泡正常率[40.6%(28/69)]均低于玻璃化冷冻组[53.5%(38/71)]、对照组[60.7%(34/56)], 3 组间差异有统计学意义($P=0.044$), 但玻璃化冷冻组、对照组间差异无统计学意义($P>0.05$); 玻璃化冷冻组、程序化冷冻组多层次级卵泡正常率[23.4%(11/47), 16.7%(7/42)]均明显低于对照组[57.3%(39/68)](P 均 <0.001), 玻璃化冷冻组多层次级卵泡正常率高于程序化冷冻组, 但差异无统计学意义($P>0.05$)。②分离卵泡比较: 玻璃化冷冻组、程序化冷冻组初级卵泡正常形态率均接近对照组, 差异无统计学意义($P>0.05$); 玻璃化冷冻组

和程序化冷冻组次级卵泡正常率[38.2%(34/89), 23.7%(23/97)]明显较低,与对照组[56.4%(61/108)]比较差异均有统计学意义($P < 0.001$);玻璃化冷冻组的次级卵泡正常形态率明显高于程序化冷冻组,差异有统计学意义($P < 0.001$);③ PPH3染色:玻璃化冷冻组颗粒细胞 PPH3 的阳性表达率接近对照组($P > 0.05$),程序化冷冻组卵泡颗粒细胞 PPH3 阳性表达率(58.72%±12.31%)明显低于对照组(67.58%±8.45%, $P = 0.04$)和玻璃化冷冻组(62.87%±9.94%, $P = 0.03$)。结论 玻璃化冷冻和程序化冷冻均能有效地保存卵巢组织,但玻璃化冷冻对卵巢组织冷冻和复融过程中各级卵泡及颗粒细胞形态学的损伤明显低于程序化冷冻,更适合下一步人类卵巢组织的冷冻保存的研究。

【关键词】 玻璃化冷冻; 程序化冷冻; 卵巢组织冷冻; 磷酸化组蛋白 H3

Comparison of the effects of vitrification and programmed freezing protocol on cryopreservation of macaque ovarian tissue

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【Abstract】 **Objective** To investigate the cryopreservation effects of vitrification and programmed freezing protocol on ovarian tissue of macaque. **Methods** Fresh macaque ovarian tissues were randomly divided into three groups: control group (fresh ovarian issue), vitrification freezing group and programmed freezing group. HE staining, preantral follicle classification and immunostaining were performed in the three groups. The morphology of follicles, the normal rate of follicles at different stages and the difference in the expression of phosphohistone H3 (PPH3) in three groups of ovarian tissues were compared. **Results** 1) HE staining showed that there were no significant differences in the normal rate of primary follicles and primordial follicles among the three groups ($P > 0.05$). The normal rate of single-layer secondary follicles in the programmed freezing group [40.6% (28/69)] was lower than that in vitrification freezing group [53.5% (38/71)] and control group [60.7% (34/56)], and the difference was statistically significant ($P = 0.044$), but there was no significant difference between vitrification freezing group and control group ($P > 0.05$). The normal rate of multi-layer secondary follicles in vitrification freezing group [23.4% (11/47)] and the programmed freezing group [16.7% (7/42)] was significantly lower than that of control group [57.3% (39/68)] ($P < 0.001$). The normal rate of multi-layer secondary follicles in vitrification freezing group was higher than that in programmed freezing group, but the difference was not statistically significant ($P > 0.05$). 2) Comparison of isolated follicles: the normal morphology of primary follicles in the vitrification freezing group and the programmed freezing group was close to control group, the difference was not statistically significant ($P > 0.05$). The normal rate of secondary follicles in vitrification freezing group [38.2% (34/89)] and programmed freezing group [23.7% (23/97)] was obvious lower than that in control group [56.4% (61/108)]. The difference was statistically significant ($P < 0.001$). The normal morphology of secondary follicles in vitrification freezing group was significantly higher than that in programmed freezing group ($P < 0.001$). 3) PPH3 staining: compared with fresh ovarian tissue, the positive expression rate of PPH3 in granulosa cells of vitrification freezing group was close to that of control group ($P > 0.05$), while the positive expression rate of PPH3 in follicular granulosa cells of programmed freezing group (58.72%±12.31%) was significantly lower than that of control group (67.58%±8.45%, $P = 0.04$) and vitrification freezing group (62.87%±9.94%, $P = 0.03$). **Conclusion** Both vitrification and programmed freezing protocol can effectively preserve ovarian tissue, but the morphological damage of follicles and granulosa cells during vitrification and thawing is significantly lower than that of programmed freezing, which is more suitable for the next study of human ovarian tissue cryopreservation.

【Key words】 Vitrification freezing; Programmed freezing; Ovarian tissue freezing; Phosphohistone H3

DOI: 10.3760/cma.j.cn101441-20190603-00242

收稿日期 2019-07-03 本文编辑 李天琦

引用本文: 许定飞, 伍琼芳, 夏雷震. 女性低体质量指数和移植胚胎数与体外受精/卵胞质内单精子显微注射-胚胎移植妊娠结局的相关性[J]. 中华生殖与避孕杂志, 2020, 40(6): 476-480. DOI: 10.3760/cma.j.cn101441-20190603-00242.

女性低体质质量指数和移植胚胎数与体外受精/卵胞质内单精子显微注射-胚胎移植妊娠结局的相关性

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【摘要】 目的 探讨女性低体质质量指数(BMI)和移植胚胎数与体外受精/卵胞质内单精子显微注射-胚胎移植(IVF/ICSI-ET)妊娠结局的相关性。方法 回顾性分析 2014 年 1 月至 2017 年 10 月期间于江西省妇幼保健院辅助生殖中心行 IVF/ICSI-ET 治疗的 9630 例妇女的临床资料，按 BMI 大小分为 2 组：A 组为低 BMI 组(BMI<18.5 kg/m²,2333 例)，B 组为正常 BMI 组(BMI=18.5~23.9 kg/m²，7297 例)；A 组根据移植胚胎数又分为 A1 亚组：选择性移植 1 枚胚胎[包括 1 枚第 3 日(D3)胚胎或 1 枚囊胚]，414 例，A2 亚组：移植 2 枚胚胎，1919 例；B 组均移植 2 枚胚胎。比较 A2 亚组和 B 组及 A1 亚组和 A2 亚组的妊娠结局。结果 ①A2 亚组和 B 组孕产妇妊娠期并发症如高血压、前置胎盘、糖尿病、子痫的发生率组间比较差异均无统计学意义($P>0.05$)。A2 亚组的临床妊娠率(64.77%)、种植率(46.43%)均低于 B 组(68.73%，49.39%)，差异均有统计学意义($P=0.002$ ， $P=0.001$)，多胎率两组比较差异无统计学意义($P>0.05$)，A2 亚组早产率(24.56%)更高，活产率(55.81%)、新生儿出生体质量[(2 773.7±631.0) g]更低，与 B 组[21.47%，58.65%，(2 825.2±628.1) g]比较差异均有统计学意义($P=0.030$ ， $P=0.022$ ， $P=0.002$)，两组分娩孕周、行双胎减胎比例差异均无统计学意义($P>0.05$)。②A1 亚组和 A2 亚组的比较，A1 亚组患者年龄[(29.80±4.87)岁]、临床妊娠率(55.31%)、多胎率(2.62%)、活产率(45.17%)、早产率(6.95%)、妊娠高血压综合征发生率(0.40%)均显著低于 A2 亚组[(30.43±5.05)岁， $P=0.014$ ；64.77%， $P<0.001$ ；4.81%， $P<0.001$ ；55.81%， $P<0.001$ ；24.56%， $P<0.001$ ；2.74%， $P=0.036$]，种植率(55.31%)高于 A2 亚组(46.43%)，差异有统计学意义($P<0.001$)。早期流产率两组差异无统计学意义($P>0.05$)，但 A1 亚组总的流产率(16.59%)更高，分娩孕周[(38.35±1.51)周]更大，和 A2 亚组[11.02%，(37.52±2.31)周]比较差异均有统计学意义($P=0.015$ ， $P<0.001$)。③A 组和 B 组双胎出生结局比较，A 组出生体质量[(2 379.7±478.6) g]更低，低出生体质量儿的比例更高(61.79%)，跟 B 组[(2 473.7±490.1) g，52.04%]比较差异均有统计学意义(P 均 <0.001)，极低出生体质量儿比例两组间差异无统计学意义($P>0.05$)。结论 低 BMI 患者选择性移植 1 枚胚胎能显著降低妊娠高血压综合征发生率、早产率和多胎率，增加新生儿出生体质量，有利于从源头上保障母婴安全，改善新生儿结局。

【关键词】 体质质量指数； 受精，体外； 卵胞质内单精子注射； 胚胎移植； 妊娠结局

Relationship of low body mass index and embryo transfer number to pregnancy outcome of women undergoing *in vitro* fertilization/intracytoplasmic sperm injection-embryo transfer

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【Abstract】 Objective To investigate the relationship of low body mass index (BMI) and embryo transfer number to pregnancy outcome of *in vitro* fertilization/intracytoplasmic sperm injection-embryo transfer (IVF/ICSI-ET) in women. **Methods** Totally 9630 cases of women undergoing IVF/ICSI-ET treatment in the Assisted Reproductive Center of Jiangxi Provincial Maternal and Child Hospital from January 2014 to October 2017 were retrospectively analyzed. They were divided into two groups according to BMI , group A: the low BMI group (BMI<18.5 kg/m², 2333 cases); group B: the normal BMI group (BMI=18.5–23.9 kg/m², 7297 cases). Group A was further divided into subgroup A1 and subgroup A2 according to the number of transplanted embryos, subgroup A1: selected transfer one embryo [including selective transfer of 1 day 3 (D3) embryo or 1 blastocyst], 414 cases; subgroup A2: transfer two embryos, 1919 cases. Two embryos were transferred in group B. The pregnancy outcomes were compared between subgroup A2 and group B and those of subgroup A1 and subgroup A2. **Results** 1) Comparison of subgroup A2 and group B: there was no significant difference of pregnancy complications between these two groups, such as hypertension, premature rupture of membranes, diabetes, and eclampsia ($P>0.05$). The clinical pregnancy rate (64.77%) and the implantation rate (46.43%) in subgroup A2 were lower than those in group B (68.73%, 49.39%), the differences were statistically significant ($P=0.002$, $P=0.001$). There was no significant difference in the multiple pregnancy rate between the two groups ($P>0.05$) . Subgroup A2 had a higher rate of preterm birth (24.56%), while the live birth rate (55.81%) and newborn birth weight [(2 773.7±631.0) g] were lower than those in group B [21.47% , 58.65% , (2 825.2±628.1) g], the differences were statistically significant ($P=0.030$, $P=0.022$, $P=0.002$). There was no significant difference between the two groups in the gestational age of delivery and the ratio of twin reduction ($P>0.05$). 2) Comparison of subgroup A1 and subgroup A2: in subgroup A1 the age [(29.80±4.87) years], the clinical pregnancy rate (55.31%), the multiple pregnancy rate (2.62%), the live birth rate (45.17%), the premature delivery rate (6.95%), the rate of hypertensive syndrome in pregnancy (0.40%) were lower than those in subgroup A2 [(30.43±5.05) years , $P=0.014$; 64.77% , $P<0.001$; 4.81% , $P<0.001$; 55.81% , $P<0.001$; 24.56% , $P<0.001$; 2.74% , $P=0.036$] , the differences were statistically significant. The implantation rate (55.31%) was higher than that in subgroup A2 (46.43%), and the difference was statistically significant ($P<0.001$). There was no significant difference in the early abortion rate between the two groups ($P>0.05$). However, the total miscarriage rate (16.59%) was higher and the gestational week [(38.35±1.51) weeks] was larger in subgroup A1, and the differences between subgroup A1 and subgroup A2 [11.02%, (37.52±2.31) weeks] were statistically significant ($P=0.015$, $P<0.001$). 3) Comparison of twin birth outcomes between group A and group B: the birth weight of group A was lower [(2 379.7±478.6) g], and the proportion of low birth weight (61.79%) was higher than that in group B [(2 473.7±490.1) g , 52.04%], the differences were statistically significant ($P<0.001$, $P<0.001$), while the proportion of very low birth weight was not statistically significant between the two groups ($P>0.05$). **Conclusion** Selective transplantation of one embryo in patients with low BMI can significantly reduce the incidence of preeclampsia, preterm delivery and multiple pregnancies, and increase the birth weight of newborns. It is conducive to the protection of maternal and child safety at the source and the improvement of newborn outcomes.

【Key words】 Body mass index ; Fertilization *in vitro* ; Intracytoplasmic sperm injection ; Embryo transfer ; Pregnancy outcomes

DOI : 10.3760/cma.j.cn101441-20191025-00484

收稿日期 2019-10-31 本文编辑 王李艳

引用本文 : 李榕珊, 陈晓菁, 朱素芹, 等. 37 例女性恶性肿瘤治疗后辅助生殖技术助孕结局分析[J]. 中华生殖与避孕杂志, 2020, 40(6): 481-486. DOI: 10.3760/cma.j.cn101441-20191025-00484.

37 例女性恶性肿瘤治疗后辅助生殖技术助孕结局分析

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【摘要】 目的 探讨辅助生殖技术应用于有生育需求的女性恶性肿瘤患者的有效性及安全性。方法 回顾性分析 2013 年至 2018 年期间在福建省妇幼保健院接受辅助生殖技术助孕的女性恶性肿瘤患者 37 例(病例组), 根据年龄及取卵时间采用 1:2 匹配的方式, 对病例组匹配 74 例非肿瘤患者作为对照组。通过分析患者的基础资料、首次助孕数据, 计算首次移植的临床妊娠率及种植率, 评估病例组及对照组的助孕结局。结果 病例组与对照组患者之间基础资料差异无统计学意义($P>0.05$); 在首次接受助孕治疗周期中, 基础卵泡刺激素(FSH)、基础黄体生成素(LH)、人绒毛膜促性腺激素(hCG)注射日雌二醇、hCG 注射日孕酮等组间差异均无统计学意义($P>0.05$); 病例组与对照组间促性腺激素(gonadotropin, Gn)使用总量[(1 984.93±756.79)IU 比(2 610.59±988.52)IU, $P=0.001$]、Gn 使用时间[(9.68±2.57) d 比(11.64±2.47) d, $P<0.001$]、优质胚胎率(49.56%比 58.94%, $P=0.016$)及首次移植胚胎数[(1.4±0.5)枚比(1.8±0.4)枚, $P=0.001$]差异均有统计学意义; 两组患者的首次移植临床妊娠率及种植率差异均无统计学意义($P>0.05$); 累积妊娠率、累积活产率、每活产需要的取卵周期数、移植周期数、胚胎数、优质胚胎数组间差异均无统计学意义($P>0.05$); 肿瘤患者接受辅助生殖助孕至今未发现肿瘤复发或新发肿瘤。结论 与对照组相比, 女性恶性肿瘤术后患者接受辅助生殖技术助孕的妊娠结局无明显差异, 辅助生殖技术能满足女性恶性肿瘤术后的生育需求且具有安全性。

【关键词】 生育需求; 生殖技术, 辅助; 育龄女性; 恶性肿瘤

基金项目: 福建省自然科学基金(2019J01052054); 福建省卫生健康科技计划项目(2019-1-57); 福建省妇幼保健院科技创新启动基金(妇幼 YCXZ 18-04)

Outcome analysis of assisted reproduction technology in 37 patients with malignant tumors

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【Abstract】 Objective To analyze the effectiveness and safety of assisted reproductive technology in the fertility needs of female patients with malignant tumors. **Methods** A total of 37 female malignant tumor patients (case group) who underwent adjuvant reproductive therapy in Fujian Provincial Maternity and Children's Hospital from 2013 to 2018 were enrolled. Totally 74 non-tumor patients were matched as control group according to age and egg retrieval time using a 1 : 2 matching method. By analyzing the demographic data and the first pregnancy data, the clinical pregnancy rate and the implantation rate of the first transplant cycle were calculated, and the pregnancy outcomes of case group and control group were evaluated. **Results** There was no significant difference in the demographic data between the two groups. There was no significant difference in the basic follicle-stimulating hormone (FSH) level, basic luteinizing hormone (LH) level, estradiol and progesterone levels on human chorionic gonadotropin (hCG) injection day during the

first treatment period ($P>0.05$). The differences of total amount of gonadotropin (Gn) used [(1 984.93±756.79) IU vs. (2 610.59±988.52) IU, $P=0.001$], duration of Gn used [(9.68±2.57) d vs. (11.64±2.47) d, $P<0.001$], high-quality embryo rate (49.56% vs. 58.94%, $P=0.016$) and the number of embryos transferred (1.4±0.5 vs. 1.8±0.4, $P=0.001$) between case group and control group were statistically significant. There was no significant difference in the clinical pregnancy rate and the implantation rate between the two groups ($P>0.05$). Cumulative pregnancy rate, cumulative live birth rate, the number of egg retrieval cycles per live birth, the number of transplant cycles, the number of embryos, and the number of high-quality embryos were not statistically significant ($P>0.05$). Tumor patients receiving assisted reproductive assistance have not been found so far recurrence or new tumor. **Conclusion** Compared with control group, the pregnancy outcomes after assisted reproductive technology in female malignant tumor patients were not significantly different. Assisted reproductive technology can fulfill the fertility needs of female malignant tumors after surgery and is safety.

【Key words】 Fertility needs ; Reproductive technology, assisted ; Women of childbearing age ; Malignant tumor

Fund program : Provincial Natural Science Foundation of Fujian, China (2019J01052054); Fujian Provincial Health Technology Project (2019-1-57); Fujian Maternity and Child Health Hospital Science Startup Foundation (YCXZ 18-04)

DOI : 10.3760/cma.j.cn101441-20190904-00401

收稿日期 2019-11-02 本文编辑 李天琦

引用本文 : 康月蓉, 帅文. 青春期多囊卵巢综合征患者的心理状况调查[J]. 中华生殖与避孕杂志, 2020, 40(6): 487-489. DOI: 10.3760/cma.j.cn101441-20190904-00401.

·临床报道·

青春期多囊卵巢综合征患者的心理状况调查

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【摘要】 目的 探讨青春期多囊卵巢综合征(polycystic ovary syndrome,PCOS)患者的心理状态。方法 选取2017年12月至2018年4月期间在同济大学附属第一妇婴保健院门诊就诊并被确诊为PCOS的青春期患者89例设为研究组,同时选取未患该病的青春期少女82例设为对照组,采用Derogatis编制的症状自评量表(symptom check list 90,SCL-90)作为测评工具,分别对两组进行心理状态评估。结果 研究组月经紊乱占78.6%,多毛占51.7%,肥胖占66.3%,SCL-90评分中强迫症状、人际关系敏感、抑郁、焦虑、恐怖等因子分数均高于对照组,差异均有统计学意义(P 均 <0.01)。结论 在治疗青春期PCOS患者躯体症状的同时,应根据青春期少女的心理特点,给予患者心理干预,提高其适应性,防止不良情绪的发生,从而使患者以良好的心态接受治疗。

【关键词】 青春期; 多囊卵巢综合征; 心理状况

Psychological status of adolescent patients with polycystic ovary syndrome

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【Abstract】 Objective To study the psychological profile of adolescent patients with polycystic ovary syndrome (PCOS) and form a customized attending plan for the patients. **Methods** From November 2017 to April 2018, interviews were conducted in 89 patients with adolescent PCOS in the First Maternity and Infant Hospital Affiliated to Tongji University. Symptom check list 90 (SCL-90) scales by Derogatis was used in this study. **Results** Menstrual disorder occurred in 70 (78.6%) patients, hirsutism occurred in 46 (51.7%) and obesity in occurred 59 (66.3%). Compared with control group, the patients showed greater psychological disturbances, including obsessive compulsive, interpersonal sensitivity, depression, anxiety, and fear. The differences had statistic significances (all $P < 0.01$). **Conclusion** Besides medical treatments for PCOS symptoms, customized psychological interventions and attending could palliate the psychological impact, reinforce the psychological adaption prevent unfavorable emotions, and produce favorable treatment outcomes.

【Key words】 Adolescent ; Polycystic ovary syndrome ; Psychological status

DOI : 10.3760/cma.j.cn101441-20190908-00410

收稿日期 2019-09-12 本文编辑 孙敏

引用本文 : 罗振宇, 汪文荣, 柴冬宁, 等. 2014—2018 年厦门市人工流产妇女特征及其变化趋势[J]. 中华生殖与避孕杂志, 2020, 40(6): 490-495. DOI: 10.3760/cma.j.cn101441-20190908-00410.

·现场调查·

2014—2018 年厦门市人工流产妇女特征及其变化趋势

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【摘要】 目的 探讨人工流产妇女的年龄、婚育状况、流产次数等特征, 分析其流行病学变化趋势, 为降低人工流产率提供依据。 **方法** 采取以医院为单位的描述性研究为基础, 对厦门大学附属妇女儿童医院计划生育科 2014 年 1 月至 2018 年 12 月期间施行人工流产手术育龄妇女登记资料进行回顾性分析。 **结果** 共纳入 28 529 例患者资料。行人工流产手术患者年龄为(28.77±5.78)岁, 其中 25~34 岁者占 58.1%, 已婚占 67.0%, 已育占 62.5%, 初次妊娠流产者占 24.0%, 流产 2 次者为 30.3%, 流产 3 次及以上者占 21.5%(最多 14 次), 有剖宫产史者占 16.1%。2014—2018 年, 受术者的年龄 [(28.05±5.69)岁、(28.47±5.62)岁、(28.70±5.80)岁、(29.03±5.81)岁、(29.59±5.82)岁]逐年上升($P < 0.001$); 已婚所占比例 (63.2%、66.8%、66.9%、67.2%、70.9%), 生育 2 孩及以上者比例 (11.8%、15.4%、20.2%、25.2%、32.2%) 和高龄重复流产人群比例 (21.7%、22.1%、23.4%、26.7%、29.9%) 均逐年上升(P 均 < 0.001); 人工流产手术者中未婚所占比 (36.8%、33.2%、33.1%、32.8%、29.1%), 未育所占比 (42.9%、38.4%、37.8%、36.3%、32.4%) 和 24 岁及以下所占比 (29.3%、25.3%、24.7%、24.1%、21.5%) 均逐年下降

(P 均 <0.001)，首次妊娠流产比例 (26.2%、23.8%、24.7%、23.4%、21.8%) 呈下降趋势 ($P<0.001$)；有剖宫产史人工流产的妇女近 5 年所占比例 (16.2%、15.0%、15.9%、16.6%、16.9%) 呈上升趋势，但差异无统计学意义($P=0.054$)。结论 已婚已育人工流产妇女在此调查中所占比例最大，产后妇女是计划生育服务的重点人群，开展产后避孕服务及推广长效可逆避孕措施刻不容缓。

【关键词】 流产，人工； 回顾性研究； 产后避孕； 长效可逆避孕措施

Characteristics and trends of induced abortions: a retrospective study in Xiamen from 2014 to 2018

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【Abstract】 Objective To investigate the characteristics and trends of women who underwent induced abortion in recent years, and to provide more evidences to decrease induced abortion rate. **Methods** A retrospective study was conducted on women who underwent induced abortions in the Family Planning Department of Women and Children's Hospital of Xiamen University from January 2014 to December 2018. **Results** Of the 28 529 women with induced abortion, the age was (28.77±5.78) years old. Women aged 25–34 years accounted for 58.1%, 67.0% of women were married, 62.5% had a history of delivery, 24.0% were in their first pregnancies, 30.3% had induced abortion for twice, 21.5% were for three times and more (the maximum frequency of induced abortion was 14). About 16.1% induced abortion women had a history of cesarean section , and rate showed an increasing trend in the five years (16.2%, 15.0%, 15.9%, 16.6%, 16.9%), but the difference was not statistically significant ($P=0.054$). From 2014 to 2018, the age of induced abortion women [(28.05±5.69) years, (28.47±5.62) years, (28.70±5.80) years, (29.03±5.81) years, (29.59±5.82) years, $P<0.001$] and the percentages of married women (63.2%, 66.8%, 66.9%, 67.2%, 70.9%) , women with two or more children (11.8%, 15.4%, 20.2%, 25.2%, 32.2%) and women undergoing at least a second abortion over 35 years old (21.7%, 22.1%, 23.4%, 26.7%, 29.9%) increased every year (all $P<0.001$). However, among the induced abortion women, the percentages of unmarried women (36.8%, 33.2%, 33.1%, 32.8%, 29.1%) , women who haven't bear children (42.9%, 38.4%, 37.8%, 36.3%, 32.4%) , women with the first pregnancy (26.2%, 23.8%, 24.7%, 23.4%, 21.8%) and women under 24 years old (29.3%, 25.3%, 24.7%, 24.1%, 21.5%) decreased during the five years period (all $P<0.001$). **Conclusion** The incidence rate of induced abortion among married women with children is the highest, so special attention should be paid to postpartum women in family planning services, and it is urgent to launch postpartum contraceptive services and promote long-term reversible contraceptive measures.

【Key words】 Abortion, induced ; Retrospective study ; Postpartum contraception ; Long-acting reversible contraception

DOI : 10.3760/cma.j.cn101441-20190604-00245

收稿日期 2019-06-18 本文编辑 王李艳

引用本文：黄琼晓, 余芝芝, 张岭, 等. 多发性卵巢囊肿与混合性垂体腺瘤：病例报道与文献综述[J]. 中华生殖与避孕杂志, 2020, 40(6): 496-500. DOI: 10.3760/cma.j.cn101441-20190604-00245.

·个案报道·

多发性卵巢囊肿与混合性垂体腺瘤：病例 报道与文献综述

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【摘要】 目的 探讨多发性卵巢囊肿合并混合性垂体腺瘤的诊疗特点。方法 对在浙江省人民医院就诊的 2 例多发性卵巢囊肿合并混合性垂体腺瘤患者的临床资料进行分析，并对相关文献进行综述。结果 病例 1 因诊治及时准确、不仅恢复了内分泌功能，且已自然受孕并顺利活产。病例 2 经历前期的误诊误治后对卵巢造成了不可逆的损伤以致提前绝经。结论 当育龄妇女发生持续的多发性卵巢囊肿时，详细的内分泌检查和垂体影像学检查对于确立诊断至关重要。解除病因后卵巢可恢复正常，从而避免不必要的卵巢手术。

【关键词】 卵泡刺激素； 垂体腺瘤； 雌二醇； 多发性卵巢囊肿

Multiple ovarian cysts and mixed pituitary adenomas: case report and literature review

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【Abstract】 Objective To investigate the diagnosis and treatment of multiple ovarian cysts with mixed pituitary adenomas. **Methods** The clinical materials of two patients with multiple ovarian cysts and mixed pituitary adenoma were analyzed, and associated literatures were reviewed. **Results** The diagnosis and treatment of the first case were timely and accurate, which not only restored the endocrine function, but also naturally conceived and gave birth. Case 2 suffered from irreversible damage to the ovary after misdiagnosis and mistreatment in the early stage, leading to early menopause. **Conclusion** When multiple ovarian cysts continue to occur in women of childbearing age, detailed endocrine examination and pituitary imaging examination are essential for the establishment of diagnosis. After removing the cause of the disease, the ovaries can return to normal, so as to avoid unnecessary ovarian surgery.

【Key words】 Follicle stimulating hormone ; Pituitary adenoma ; Estradiol ; Multiple ovarian cysts

DOI : 10.3760/cma.j.cn101441-20190328-00127

收稿日期 2019-05-28 本文编辑 宋培培

引用本文：王常宏, 宛杨, 梅莉, 等. 3 例唐氏综合征女患者生育情况及产前诊断实践[J]. 中华生殖与避孕杂志, 2020, 40(6): 501-505. DOI: 10.3760/cma.j.cn101441-20190328-00127.

·个案报道·

3 例唐氏综合征女患者生育情况及产前 诊断实践

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【摘要】 目的 总结唐氏综合征女性患者生育情况及产前诊断的特点。方法 对3例唐氏综合征女性患者生育情况及产前诊断的特点及相关文献进行分析。结果 3例孕妇均有唐氏综合征特殊面容及智力低下，外周血染色体检查均提示为47,XX,+21；3例孕妇丈夫外周血染色体检查皆正常。3例孕妇在中孕期行羊水穿刺，抽取胎儿羊水送检染色体核型及染色体微阵列分析(chromosomal microarray analysis, CMA)检查，结果提示染色体核型均未见明显异常，病例1、病例3胎儿羊水CMA检查正常，病例2胎儿羊水CMA检查结果显示胎儿在1号染色体1q21.1-q21.2区段存在2.1 Mb片段的缺失。3例孕妇均行产前超声筛查，胎儿均未见明显异常。随访3例孕妇均于足月分娩，婴儿随访至1岁时无不良临床表型。结论 唐氏综合征女性患者有可能自然妊娠并生育正常婴儿，建议对此类孕妇及配偶进行充分的生育前后遗传咨询，并对胎儿进行全面的遗传学诊断评估。

【关键词】 唐氏综合征； 生育情况； 产前诊断

Reproduction and prenatal diagnosis of three women with Down's syndrome

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【Abstract】 Objective To investigate the reproduction and prenatal diagnosis of female with Down's syndrome. **Methods** Three cases of women with Down's syndrome were analyzed and relative literatures were reviewed. **Results** All the three pregnant women had Down's syndrome special features and mental retardation, and their karyotypes of peripheral blood chromosome were all 47,XX,+21. The karyotypes of peripheral blood chromosome of their husbands were all normal. All the three women underwent amniocentesis during the second trimester. The cytogenetic analysis of cultured amniocytes of all the three cases showed normal karyotypes. Chromosomal microarray analysis (CMA) results of cultured amniocytes from all the three cases were successfully analyzed. Case 1 and Case 3 were normal, while 2.1 Mb deletion of 1q21.1-q21.2 was detected in Case 2. Prenatal ultrasound screening of all the three cases showed normal. All the three women delivered at term and their babies at 1-year-old all had normal phenotype. **Conclusion** Females with Down's syndrome may be capable of reproduction and give birth to healthy children. It's necessary to provide sufficient prenatal and postnatal genetic counselling to Down's pregnant women and families, and to offer comprehensive genetic testing to fetuses during pregnancy.

【Key words】 Down's syndrome； Reproduction； Prenatal diagnosis

DOI：10.3760/cma.j.cn101441-20190520-00198

收稿日期 2019-05-23 本文编辑 宋培培

引用本文：罗颖莹，王倩，崔趁趁，等. 维生素D缺乏对多囊卵巢综合征合并胰岛素抵抗患者影响的研究进展[J]. 中华生殖与避孕杂志, 2020, 40(6): 506-510. DOI: 10.3760/cma.j.cn101441-20190520-00198.

维生素 D 缺乏对多囊卵巢综合征合并胰岛素抵抗患者影响的研究进展

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【摘要】 胰岛素抵抗(insulin resistance, IR)是多囊卵巢综合征(polycystic ovary syndrome, PCOS)的重要病理生理改变，在女性代谢和生殖障碍中起着重要作用。维生素 D 缺乏现象普遍存在于 PCOS 患者中，并与 IR、生育力下降以及心血管疾病等远期并发症相关。本文探讨了维生素 D 缺乏对 PCOS 合并 IR 患者影响的研究进展，以期为 PCOS 合并 IR 患者的发病机制、诊断治疗及预防提供新的理论依据。

【关键词】 多囊卵巢综合征； 维生素 D； 胰岛素抵抗

基金项目：国家自然科学基金面上项目(81571407)

Research progress on the effect of vitamin D deficiency on polycystic ovary syndrome patients with insulin resistance

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【Abstract】 Insulin resistance (IR), as an important pathophysiological change in polycystic ovary syndrome (PCOS), plays a crucial role in female metabolic and reproductive disorders. Vitamin D deficiency is commonly observed in PCOS patients which is associated with long-term complications such as IR, reproductive disorders and cardiovascular diseases. In this paper, we discuss the research progress on the effect of vitamin D deficiency on PCOS patients with IR, in order to provide a better theoretical basis of the pathological mechanisms, diagnosis and treatment for these patients.

【Key words】 Polycystic ovary syndrome ; Vitamin D ; Insulin resistance

Fund program : Surface Program of National Natural Science Foundation of China (81571407)

DOI : 10.3760/cma.j.cn101441-20190525-00205

收稿日期 2019-06-03 本文编辑 王李艳

引用本文：李丽斐, 李发敏子, 吕萌, 等. 宫颈炎及其临床治疗对妊娠结局的影响[J]. 中华生殖与避孕杂志, 2020, 40(6): 511-514. DOI: 10.3760/cma.j.cn101441-20190525-00205.

宫颈炎及其临床治疗对妊娠结局的影响

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【摘要】 宫颈炎是常见的女性生殖系统感染性疾病。子宫颈管作为门户对子宫及盆腔有一定保护作用，当炎症上行蔓延，严重时影响正常受孕和妊娠过程，导致不孕、流产、早产、胎膜早破等不良妊娠结局以及辅助生殖的失败，还可致使新生儿感染，甚至死亡。临床治疗宫颈炎可改善妊娠情况，主要为物理治疗和药物治疗，但各种干预方式对女性宫颈感染的预后及潜在影响不尽相同，故采取积极、合适的治疗显得尤为关键。本文就宫颈炎及不同治疗方式对妊娠结局、辅助生殖的影响作一讨论，以期临床进行相关疾病的治疗提供参考。

【关键词】 宫颈炎；宫颈炎治疗；妊娠结局；生殖技术，辅助

基金项目：国家地区科学基金(81960279)；甘肃省自然科学基金青年科技项目(18JR3RA361)；甘肃省科技重大专项(092NKDA009)

Effects of cervical inflammation and clinical treatment on pregnancy outcome

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【Abstract】 Cervicitis is a common infectious disease of female reproductive system. As a portal to the uterus and pelvic cavity, cervical tube has a certain protective effect. When the inflammation spreads upward, it can not only affect the normal pregnancy and cause many adverse pregnancy outcomes, such as infertility, abortion, premature birth, premature rupture of membranes and reproductive failure, but also can cause neonatal infection, even neonatal death. The clinical treatment of cervicitis can improve pregnancy, mainly about physical therapy and drug therapy, but the prognosis and potential impact of various intervention methods on female cervical infection are not the same. Therefore, it is particularly critical to adopt active and appropriate treatment. This paper discusses the effects of cervicitis and different treatment methods on pregnancy outcome and assisted reproduction technology as to provide reference for the treatment of related diseases in clinic.

【Key words】 Cervicitis ; Treatment of cervicitis ; Pregnancy outcome ; Reproductive technology, assisted

Fund program : National Science Foundation for Region of China (81960279); The Youth Technical Project of the Natural Science Foundation of Gansu Province (18JR3RA361); Major Science and Technology Projects in Gansu Province (092NKDA009)

DOI : 10.3760/cma.j.cn101441-20190617-00261

收稿日期 2019-07-12 本文编辑 李天琦

引用本文：樊梓怡，刘芬婷，李蓉. 生殖道菌群对女性生育力的影响[J]. 中华生殖与避孕杂志，2020，40(6): 515-520. DOI: 10.3760/cma.j.cn101441-20190617-00261.

· 综 述 ·

生殖道菌群对女性生育力的影响

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【摘要】 女性生殖道微生物群 (female reproductive tract microbiota) 指定殖在女性生殖道中的微生物的集合，其动态变化、功能与人体生理功能关系的研究不断取得进展。近年，借助第二代高通量测序和宏基因组测序等新研究手段，不断有研究表明女性生殖道微生物可能在生育过程中起到重要作用，异常生殖道菌群可能导致不孕，还与流产、胎膜早破、早产等不良孕产相关。本文对近年生殖道菌群对女性生育力的影响的研究进展进行综述，以期给今后此类研究的方向提供思路。

【关键词】 生殖道微生物群； 生育力； 分子微生物生态学

Effect of reproductive tract microbiota on female fertility

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【Abstract】 Female reproductive tract microbiota refers to the collection of microorganisms in female reproductive tract, its dynamics, function and interactions with host have been investigated in depth. In recent years, the advancement of next-generation sequencing and metagenomic sequencing and other technologies has transformed researches on reproductive tract microbial community, unveiling its possible impact on reproduction function. Furthermore, abnormal reproductive tract microbiota may predispose to infertility, miscarriage, premature rupture of membranes, premature delivery and other diseases. Here we review the current literature that focuses on female reproductive tract microbiota and highlight its possible role on female fertility.

【Key words】 Female reproductive tract microbiota ; Fertility ; Molecular microbial ecology

DOI : 10.3760/cma.j.cn101441-20190601-00233

收稿日期 2019-06-17 本文编辑 李天琦

引用本文：梁秀茹, 孟艳. 卵巢储备功能减退的内质网应激机制及其研究进展[J]. 中华生殖与避孕杂志, 2020, 40(6): 521-525.

DOI: 10.3760/cma.j.cn101441-20190601-00233.

·综述·

卵巢储备功能减退的内质网应激机制及其研究进展

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【摘要】 卵巢储备功能减退 (DOR) 包括生殖功能减退和内分泌功能减退，最终导致女性生育力下降。内质网是细胞内重要的细胞器，参与蛋白的合成折叠与分泌、脂质代谢、类固醇激素合成、Ca²⁺储存等细胞内活动。细胞内外环境的变化，如氧化应激等皆有可能扰乱内质网稳态，导

致内质网未折叠蛋白反应 (UPR)。初期 UPR 有助于维持机体细胞存活，但刺激强度过高或时间过长，则会导致细胞凋亡。越来越多的研究证实，内质网应激参与 DOR 发生的病理机制，与卵泡闭锁、卵巢纤维化增加、激素合成功能下降等过程密切相关。本文将综述 DOR 发生发展过程中的内质网应激机制及其研究进展。

【关键词】 内质网应激； 卵巢储备功能减退； 卵泡闭锁； 类固醇激素； 纤维化

基金项目：江苏省自然科学基金(BK20161592)；默克雪兰诺中国生殖医学研究基金(MerckSerono-CREATE-2016023)

Research progress of endoplasmic reticulum stress on diminished ovarian reserve

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【Abstract】 Diminished ovarian reserve (DOR) is characterized by reduced reproductive capacity and endocrine disorders, causing poor fertility outcomes. Endoplasmic reticulum (ER) is an important organelle responsible for several cellular functions, including synthesis and folding of proteins, lipid metabolism, steroid hormone synthesis and Ca^{2+} storage. Various types of stress can disrupt ER homeostasis and induce ER stress, mainly unfolded protein response (UPR). At initial stage the UPR promotes cell survival, but along with excessive or prolonged stress it will lead to apoptosis. Recently more evidence demonstrates that ER stress is involved in the initiation of DOR and associated with follicle atresia, decreased hormone synthesis and ovarian fibrosis. This review will focus on the research progress of ER stress on DOR.

【Key words】 Endoplasmic reticulum stress ; Diminished ovarian reserve ; Follicle atresia ; Steroid hormone ; Fibrosis

Fund program : Natural Science Foundation of Jiangsu Province of China (BK20161592); Merck China Research Fund for Fertility Experts (MerckSerono-CREATE-2016023)