

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9期 2020年9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

编 辑

中华生殖与避孕杂志
编辑委员会

200237,上海市老沪闵路779号
电话:(021)64438169
传真:(021)64438975
Email:randc@sippr.org.cn
http://zhshzybyzz.yiigle.com

总编辑

乔 杰

编辑部主任

王 健

出 版

《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

2020年版权归主办者所有

未经授权,不得转载、摘编本刊文章,不得使用本刊的版式设计

除非特别声明,本刊刊出的所有文章不代表中华医学会和本刊编委会的观点

本刊如有印装质量问题,请向本刊编辑部调换

目 次

临床研究

激素替代周期冻融优质单囊胚移植影响活产率的多因素分析及

预测模型建立 张少娣 尹轶莎 李秋圆等 701

雌激素预处理在不同卵巢反应人群使用拮抗剂方案中的

应用研究 王彩霞 刘芸 黄吴键等 708

基于人体成分分析的生活方式干预在非肥胖型多囊卵巢

综合征患者治疗作用的初步研究 苏椿淋 唐玉珠 林金芳 716

基于microRNA表达的多囊卵巢综合征患者痰湿证生物

标志物的初筛 张宁 张建霞 杨惠鸿 723

精子DNA碎片指数对卵胞质内单精子显微注射周期

助孕结局的影响 吴春香 刁飞扬 杨晓玉等 729

施孕可辅助授精系统治疗男性不育症的多中心、前瞻性、开放、

自身对照、随机交叉的临床研究 田汝辉 叶臻 郭通航等 734

男性夜间睡眠时长和精液质量的

关联研究 刘佩意 朱嘉辉 袁冠湘等 741

循证医学

坤泰胶囊用于治疗卵巢储备功能低下有效性的

Meta分析 张宝丽 张莉莉 杨媛等 750

临床报道

卵巢低反应患者黄体期促排卵行体外受精/卵胞质内单精子

显微注射助孕临床结局分析 郭丽娜 王楠 吕翠婷等 756

子宫肌壁间妊娠9例临床分析并文献复习 屈清华 林奕 雷莉等 761

综 述

抗苗勒管激素与女性生殖结局关系的

研究进展 何翌晨 吴琰婷 黄荷凤 767

人类卵巢组织冷冻保存与移植技术

发展现状 朱灿灿 刘召青 齐念民 773

子宫内膜异位症对卵泡颗粒细胞的影响 毛菁沁 侯振 崔毓桂等 778

葡萄糖代谢与卵母细胞成熟 张月鑫 李玲君 崔毓桂 782

《中华生殖与避孕杂志》第二届通讯编辑委员会成员名单 760

《中华生殖与避孕杂志》第二届编辑委员会成员名单 772

本刊稿约见本卷第1期封二,第7期封二

本期责任编辑 乔杰

本期责任编辑 孙敏

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 9

September 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

Editing

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

Editor-in-Chief

Qiao Jie

Managing Director

Wang Jian

Publishing

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

Copyright © 2020 by the all sponsors

No content published by the journals of Chinese Medical Association may be reproduced or abridged without authorization. Please do not use or copy the layout and design of the journals without permission.

All articles published represent the opinions of the authors, and do not reflect the official policy of the Chinese Medical Association or the Editorial Board, unless this is clearly specified.

CONTENTS IN BRIEF

Clinical Study

- Multivariate analysis and prediction model of live birth rate after frozen-thawed high-quality single blastocyst transfer during hormone replacement cycle** 701
Zhang Shaodi, Yin Yisha, Li Qiuyuan, et al
- Application of estrogen pretreatment in different ovarian responders with the gonadotrophin-releasing hormone antagonist protocol** 708
Wang Caixia, Liu Yun, Huang Wujian, et al
- Life-style intervention improves insulin resistance and ovulation in non-obese polycystic ovary syndrome patients based on the body composition analysis: a pilot study** 716
Su Chunlin, Tang Yuzhu, Lin Jinfang
- Screening the biomarkers of phlegm-dampness syndrome in patients with polycystic ovary syndrome based on microRNA expression** 723
Zhang Ning, Zhang Jianxia, Yang Huihong
- Effect of sperm DNA fragment index on the outcome of intracytoplasmic sperm injection cycles** 729
Wu Chunxiang, Diao Feiyang, Yang Xiaoyu, et al
- Multi-center, prospective, open self-controlled, randomly crossed trial on the treatment with the conception aid kit in male infertility** 734
Tian Ruhui, Ye Zhen, Guo Tonghang, et al
- Association between nighttime sleep duration and semen quality** 741
Liu Peiyi, Zhu Jiahui, Yuan Guanxiang, et al

Evidence-based Medicine

- Efficacy of Kuntai capsule for treating ovarian reserve dysfunction: a Meta-analysis** 750
Zhang Baoli, Zhang Lili, Yang Yuan, et al

Clinical Report

- Clinical outcomes of luteal phase stimulation for *in vitro* fertilization/ intracytoplasmic sperm injection treatment in poor ovarian responders** 756
Guo Lina, Wang Nan, Lyu Cuiting, et al
- Clinical analysis of 9 cases of intermural pregnancy and literature review** 761
Qu Qinghua, Lin Yi, Lei Li, et al

Review

- Research progress of anti-Müllerian hormone in female reproductive outcomes** 767
He Yichen, Wu Yanting, Huang Hefeng
- Development status for cryopreservation and transplantation of human ovarian tissue** 773
Zhu Cancan, Liu Zhaoqing, Qi Nianmin
- Effect of endometriosis on follicular granulosa cells** 778
Mao Jingqin, Hou Zhen, Cui Yugui, et al
- Research progress of glucose metabolism in oocyte maturation** 782
Zhang Yuexin, Li Lingjun, Cui Yugui

DOI: 10.3760/cma.j.cn101441-20190820-00365

收稿日期 2019-08-26 本文编辑 王李艳

引用本文: 张少娣, 尹轶莎, 李秋圆, 等. 激素替代周期冻融优质单囊胚移植影响活产率的多因素分析及预测模型建立[J]. 中华生殖与避孕杂志, 2020, 40(9): 701-707. DOI: 10.3760/cma.j.cn101441-20190820-00365.

激素替代周期冻融优质单囊胚移植影响活产率的多因素分析及预测模型建立

张少娣 尹轶莎 李秋圆 王淑娜 张翠莲

河南省人民医院 (河南大学人民医院), 郑州 450003

通信作者 :张翠莲 ,Email :zhangshd@126.com ,电话 :+86-371-65580852

【摘要】 目的 探讨激素替代周期冻融优质单囊胚移植活产率的影响因素,分析冻融胚胎移植(FET)周期选择性单囊胚移植的适应证。方法 回顾性分析2014年1月至2017年12月期间在河南省人民医院生殖中心行激素替代方案冻融胚胎移植(HRT-FET)的1675个优质单囊胚移植周期,采用单因素分析和多元logistic回归分析影响活产率的相关因素,根据多元logistic回归分析结果建立活产率的预测模型。结果 单因素分析结果显示,年龄($P<0.0001$)、体质指数(BMI) ($P=0.0128$)、不孕年限($P<0.0001$)、FET次数($P<0.0001$)、内膜厚度($P=0.0249$)、不孕类型($P=0.0017$)、移植胚胎发育时间($P<0.0001$)为活产率的影响因素。多元logistic回归分析显示,年龄($OR=0.98$, $P=0.0377$)、FET次数($OR=0.75$, $P<0.0001$)、不孕年限($OR=0.94$, $P=0.0037$)、内膜厚度($OR=1.07$, $P=0.0203$)、不孕类型(以原发不孕为对照组,继发不孕组 $OR=0.77$, $P=0.0141$)、囊胚发育时间[以第5日(D5)为对照组,第6日(D6)组 $OR=0.45$, $P<0.0001$]是活产率的影响因素($P<0.05$)。多元logistic回归分析调整其他因素的影响后显示BMI并不影响活产率($OR=0.97$, $P=0.0665$)。分类多元logistic回归分析结果显示,年龄 >38 岁($OR=0.65$, $P=0.0156$)、FET次数 >1 次($OR=0.45$, $P<0.0001$; $OR=0.32$, $P<0.0001$; $OR=0.30$, $P<0.0001$)时患者活产率下降;子宫内膜厚度为 $10.0\sim 11.9$ mm时,活产率最佳($OR=1.84$, $P=0.0005$)。预测模型在最佳阈值(约登指数最大时,敏感度+特异度最大的分界值)敏感度为0.63,特异度为0.64,曲线下面积

(AUC)=0.69, 模型预测能力中等。结论 囊胚发育时间、不孕类型、胚胎移植次数是影响优质单囊胚 HRT-FET 活产率的主要因素。HRT-FET 选择性单囊胚移植的适应证包括以下条件：原发不孕、年龄 ≤ 38 岁、首次 FET、子宫内膜厚度 10.0~11.9 mm、D5 优质囊胚。

【关键词】 激素替代周期； 冻融胚胎移植； 单囊胚移植； 活产率

基金项目：国家科技攻关计划（2018YFC1002106）

Multivariate analysis and prediction model of live birth rate after frozen-thawed high-quality single blastocyst transfer during hormone replacement cycle

Zhang Shaodi , Yin Yisha , Li Qiuyuan , Wang Shuna , Zhang Cuilian

Henan Provincial People's Hospital (People's Hospital of Henan University), Zhengzhou 450003, China

Corresponding author: Zhang Cuilian, Email: zhangshd@126.com, Tel: +86-371-65580852

【Abstract】 Objective To explore the factors influencing live birth rate of frozen-thawed high-quality single blastocyst transfer in hormone replacement therapy and to analyze the indications of selective single blastocyst transfer in frozen-thawed embryo transfer (FET). **Methods** A retrospective analysis was conducted on 1675 cycles of frozen-thawed high-quality single blastocyst transfer with hormone replacement therapy (HRT) in Reproductive Medicine Center of Henan Provincial People's Hospital from January 2014 to December 2017. Univariate analysis and multivariate logistic regression analysis were used to analyze the relevant factors affecting live birth, and the prediction model of affecting live birth rate was established according to the results of multivariate logistic regression analysis. **Results** The result of univariate analysis showed that live birth rate was influenced by those factors such as age ($P<0.000\ 1$), body mass index (BMI) ($P=0.012\ 8$), duration of infertility ($P<0.000\ 1$), previous times of FET ($P<0.000\ 1$), endometrial thickness ($P=0.024\ 9$), infertility type ($P=0.001\ 7$) and the time of embryo development ($P<0.000\ 1$). The result of multivariate logistic regression analysis showed that age ($OR=0.98$, $P=0.037\ 7$), previous times of FET ($OR=0.75$, $P<0.000\ 1$), duration of infertility ($OR=0.94$, $P=0.003\ 7$), endometrial thickness ($OR=1.07$, $P=0.020\ 3$), infertility type (primary infertility as control group, secondary infertility group $OR=0.77$, $P=0.014\ 1$) and days of embryo development [day 5 (D5) as control group, day 6 (D6) group $OR=0.45$, $P<0.000\ 1$] had an influence on live birth rate. After adjusting for the influence of other factors, BMI didn't affect live birth rate according to the result of multiple logistic regression analysis ($OR=0.97$, $P=0.066\ 5$). Classification multiple logistic regression analysis showed that the live birth rate declined in the groups of age >38 years ($OR=0.65$, $P=0.015\ 6$), previous times of FET >1 ($OR=0.45$, $P<0.000\ 1$; $OR=0.32$, $P<0.000\ 1$; $OR=0.30$, $P<0.000\ 1$). The optimal live birth rate could be gotten in the endometrial thickness interval of 10.0–11.9 mm. The sensitivity and specificity of the prediction model were 0.63 and 0.64, and area under the curve (AUC) was 0.69 at the optimal threshold (when the YOUDEN index was the largest, the threshold of sensitivity + specificity was the

largest). The prediction ability of the model was moderate. **Conclusion** Days of blastocyst development, infertility type and previous times of FET are the main factors affecting the live birth rate of frozen-thawed high-quality single blastocyst transfer in HRT. Indications for selective single blastocyst transfer in HRT-FET are as follows: primary infertility, 38 years old or less, FET for the first time, endometrial thickness 10.0–11.9 mm and D5 high-quality blastocyst.

【Key words】 Hormone replacement therapy ; Frozen-thawed embryo transfer ; Single blastocyst transfer ; Live birth rate

Fund program : National Science and Technology Program (2018YFC1002106)

· 临床研究 ·

DOI : 10.3760/cma.j.cn101441-20190816-00360

收稿日期 2019-09-06 本文编辑 孙敏

引用本文: 王彩霞, 刘芸, 黄吴键, 等. 雌激素预处理在不同卵巢反应人群使用拮抗剂方案中的应用研究[J]. 中华生殖与避孕杂志, 2020, 40(9): 708-715. DOI: 10.3760/cma.j.cn101441-20190816-00360.

雌激素预处理在不同卵巢反应人群使用拮抗剂方案中的应用研究

王彩霞 刘芸 黄吴键 何凌云 徐红妹 毛丽华 王锦华

福建医科大学福总临床医学院(第九〇〇医院)/厦门大学附属东方医院(第九〇〇医院)妇产科/福建中医药大学福总教学医院(第九〇〇医院)生殖医学中心, 福州 350025

通信作者: 刘芸, Email: liuyunfj@126.com, 电话: +86-591-83784734

【摘要】 目的 探讨体外受精-胚胎移植(IVF-ET)拮抗剂方案促排卵前使用雌激素预处理的必要性及临床效果。方法 回顾性分析 2015 年 1 月至 2016 年 12 月期间在福建中医药大学福总教学医院生殖医学中心使用拮抗剂方案进行 IVF-ET 的 1042 例患者临床资料, 根据是否行雌激素预处理分为未预处理组和预处理组, 并依据不同卵巢反应(高反应、正常反应、低反应)比较未预处理组与预处理组的临床特征与助孕结局。结

果 不论哪种卵巢反应性,经雌激素预处理后血清卵泡刺激素(FSH)、血清促黄体生成素(LH)水平、窦卵泡直径及其变异系数(CV)均显著小于未预处理组(P 均 <0.001)。未预处理组中卵巢高反应、正常反应和低反应患者的促性腺激素(Gn)使用总量[(1 693.4 $\pm$ 569.8) IU, (2 242.5 $\pm$ 635.8) IU, (2 686.4 $\pm$ 833.8) IU]及Gn使用时间[(9.7 $\pm$ 1.1) d, (9.6 $\pm$ 1.1) d, (9.5 $\pm$ 1.6) d]均显著小于预处理组[(1 897.9 $\pm$ 508.0) IU, (2 458.9 $\pm$ 759.1) IU, (2 942.1 $\pm$ 756.0) IU; (10.8 $\pm$ 1.1) d, (10.5 $\pm$ 1.4) d, (10.5 $\pm$ 1.6) d] ($P<0.001$, $P=0.019$, $P=0.029$; $P<0.001$, $P<0.001$, $P<0.001$)。雌激素预处理后,正常反应和低反应人群中,Gn使用第5~6日、第7~8日和人绒毛膜促性腺激素(hCG)注射日卵泡不同步率较未预处理组显著降低(P 均 <0.05);hCG注射日直径 ≥ 14 mm的卵泡数、获卵数、成熟卵数、双原核受精率、优质胚胎数,预处理组均显著大于未预处理组(P 均 <0.05)。雌激素预处理后,高反应人群Gn使用第5~6日卵泡不同步率(17.7%)较未预处理组(26.7%)显著降低($P=0.012$),但其余治疗过程及实验室相关指标与未预处理组相比差异均无统计学意义(P 均 >0.05)。正常反应和低反应人群中,获卵数、成熟卵数、优质胚胎数在预处理组和未处理组间差异有统计学意义($P<0.001$, $P<0.001$; $P<0.001$, $P<0.001$; $P<0.001$, $P=0.018$)。正常反应人群累积妊娠率预处理组(81.3%)显著高于未预处理组(70.5%, $P=0.044$),而新鲜胚胎移植临床妊娠率、流产率、全部胚胎冷冻后首次冻融移植妊娠率两组在不同卵巢反应人群中差异均无统计学意义(P 均 >0.05)。结论 对于卵巢正常反应与低反应人群,拮抗剂方案促排卵前应用雌激素预处理可以改善卵泡发育的同步性,增加成熟卵子数和优质胚胎数,进而改善妊娠结局,而在高反应人群中并未体现出优势,且增加了Gn使用总量和使用时间,临床应用价值不大。

【关键词】 拮抗剂方案; 雌激素预处理; 卵泡发育同步性

基金项目:军队计生科研课题项目(16JS013)

Application of estrogen pretreatment in different ovarian responders with the gonadotrophin-releasing hormone antagonist protocol

Wang Caixia, Liu Yun, Huang Wujian, He Lingyun, Xu Hongmei, Mao Lihua, Wang Jinhua

Fuzhou General Clinical Medical College, Fujian Medical University (the 900th Hospital of Joint Logistics Support Forces)/Gynecology and Obstetrics Department of Dongfang Hospital Affiliated to Xiamen University (the 900th Hospital of Joint Logistics Support Forces)/Teaching Hospital of Fujian University of Traditional Chinese Medicine (the 900th Hospital of Joint Logistics Support Forces), Center of Reproductive Medicine, Fuzhou 350025, China

Corresponding author: Liu Yun, Email: liuyunfj@126.com, Tel: +86-591-83784734

【Abstract】 **Objective** To explore the effects of estrogen pretreatment on the outcomes of *in vitro* fertilization and embryo transfer (IVF-ET) treatment of gonadotrophin-releasing hormone antagonist (GnRH-A) protocol with controlled ovarian hyperstimulation. **Methods** Retrospective analysis was performed on the clinical data of 1042 patients who have underwent IVF-ET treatment of GnRH-A protocol in the Center of Reproductive Medicine Teaching Hospital of Fujian University

of Traditional Chinese Medicine from January 2015 to December 2016. According to whether the estrogen pretreatment were conducted, patients were divided into pretreatment group and non-pretreatment group. Clinical data and treatment outcomes of IVF-ET between two groups were compared according to different ovarian reactions (high response, normal response, and low response). **Results** Compared with non-pretreatment group, the level of serum follicle stimulation hormone (FSH) and luteinizing hormone (LH), antral follicle diameter and coefficient of variance (CV) significantly decreased in pretreatment group (all $P<0.001$). Total dosage and duration of gonadotropin (Gn) used [(1 693.4±569.8) IU , (2 242.5±635.8) IU , (2 686.4±833.8) IU ; (9.7±1.1) d , (9.6±1.1) d , (9.5±1.6) d] in non-pretreatment group were less than those in pretreatment group [(1 897.9±508.0) IU , (2 458.9±759.1) IU , (2 942.1±756.0) IU ; (10.8±1.1) d , (10.5±1.4) d , (10.5±1.6) d] ($P<0.001$, $P=0.019$, $P=0.029$; $P<0.001$, $P<0.001$, $P<0.001$). In patients with normal ovarian response and poor ovarian response, the follicular unsynchronization rate in Gn used day 5/6, day 7/8 and the day of human chorionic gonadotropin (hCG) injection significantly reduced with estrogen pretreatment (all $P<0.05$), and the number of follicles with a diameter $\geq$ 14 mm on the day of hCG injection, the number of oocytes retrieved and mature oocytes, two pronuclear fertilization rate and the number of high-quality embryos of pretreatment group were larger than those of non-pretreatment group (all $P<0.05$). In patients with high ovarian response, the follicular unsynchronization rate (17.7%) in Gn used day 5/6 of pretreatment group was lower than that of non-pretreatment group (26.7%, $P=0.012$), while other clinical outcomes and indexes relevant to the laboratory of two groups were not statistically significant (all $P>0.05$). In patients with normal and poor ovarian response, the differences in the number of oocytes retrieved, mature oocytes, and high-quality embryos between pretreatment group and non-pretreatment group were statistically significant ($P<0.001$, $P<0.001$; $P<0.001$, $P<0.001$; $P<0.001$, $P=0.018$). In patients with normal ovarian response, the cumulative clinical pregnancy rate (81.3%) of pretreatment group was higher than that of non-pretreatment group (70.5% , $P=0.044$). In people with different ovarian responses, the clinical pregnancy rate, the miscarriage rate in fresh cycle and the clinical pregnancy rate in the first thaw cycle after freeze-all were not statistically significant between the two groups (all $P>0.05$). **Conclusion** In patients with normal and poor ovarian response, estrogen pretreatment before GnRH-A protocol can improve the homogeneity of follicular development, increase the number of mature oocytes and high-quality embryos, and thus improve clinical pregnancy outcomes. While in patients with high ovarian response, estrogen pretreatment show no superiority and clinical application value for its larger total Gn dosage and stimulation duration.

【 Key words 】 Gonadotrophin-releasing hormone antagonist protocol ; Estrogen pretreatment ; Homogeneity of follicular development

Fund program : Military Family Planning Research Project (16JS013)

DOI : 10.3760/cma.j.cn101441-20190824-00372

收稿日期 2019-10-24 收稿日期 李天琦

引用本文: 苏椿淋, 唐玉珠, 林金芳. 基于人体成分分析的生活方式干预在非肥胖型多囊卵巢综合征患者治疗作用的初步研究 [J]. 中华生殖与避孕杂志, 2020, 40(9): 716-722. DOI: 10.3760/cma.j.cn101441-20190824-00372.

基于人体成分分析的生活方式干预在非肥胖型多囊卵巢综合征患者治疗作用的初步研究

苏椿淋¹ 唐玉珠² 林金芳¹

¹复旦大学附属妇产科医院, 上海 200011; ²爱丁互联网连锁门诊, 上海 200040

通信作者: 林金芳, Email: linjinfang2002@126.com, 电话: +86-15921516258

【摘要】 目的 探讨生活方式干预对非肥胖型多囊卵巢综合征(PCOS)患者的治疗作用。方法 本研究为前瞻性自身前后对照研究, 收集2017年5月至2018年3月期间在复旦大学妇产科医院就诊的非肥胖[$18.5 \text{ kg/m}^2 \leq \text{BMI} < 24.0 \text{ kg/m}^2$] PCOS患者43例, 通过体成分测定结果制定以增肌及或增肌减脂为目标的个体化的饮食和运动生活干预方案。12周后分析患者体成分数据变化与胰岛素抵抗及生殖激素改善情况与排卵恢复情况的相关性。结果 干预前, 43例非肥胖型PCOS患者中, 21例体脂率正常, 22例(51.2%)体脂率高于正常; 17例患者骨骼肌重量标准占比正常(90%~110%), 26例(60.5%)骨骼肌重量标准占比低于正常。相关性分析显示, 空腹胰岛素(FINS)、胰岛素抵抗指数(HOMA-IR)与患者体脂率呈正相关($r=-0.442, P=0.003; r=0.395, P=0.010$), 与骨骼肌重量标准占比呈负相关($r=-0.492, P=0.001; r=-0.536, P<0.001$)。经12周的生活方式干预后, 非肥胖型PCOS患者的体脂率较干预前明显降低($P<0.001$); 骨骼肌标准占比及骨骼肌重量较干预前明显升高($P<0.001$); HOMA-IR较前明显降低($P<0.001$); 黄体生成素(LH)和总睾酮

较干预前均明显降低 ($P=0.005$, $P=0.004$) ; 12 周后 70% (31 例) 的患者恢复自发排卵 , 较治疗前明显升高 ($P<0.001$)。相关性分析显示 , ①治疗后患者骨骼肌重量标准占比与 HOMA-IR 呈负相关 ($r=-0.512$, $P=0.001$) , 与胰岛素曲线下面积呈负相关 ($r=-0.421$, $P=0.007$) ; ②治疗后患者的体脂率与 LH、总睾酮呈正相关 ($r=0.455$, $P=0.003$; $r=0.377$, $P=0.015$) ; 治疗后患者的骨骼肌重量标准占比与治疗后总睾酮呈负相关 ($r=-0.307$, $P=0.048$) ; ③治疗后的 LH 与治疗后 HOMA-IR 呈正相关 ($r=0.39$, $P=0.011$) ; ④回归性分析显示 , 自发排卵的恢复与体质量的下降、骨骼肌标准占比的升高、胰岛素曲线下面积的下降密切相关 ($P=0.016$, $P=0.004$, $P=0.003$)。结论 正常体质量的非肥胖型 PCOS 患者的胰岛素抵抗与其体脂率的增加、骨骼肌重量标准占比的下降密切相关 ; 根据体成分结果制定个体化的生活方式干预(增肌或增肌减脂方案) 能增加正常体质量非肥胖型 PCOS 患者的胰岛素敏感性 , 并降低此类患者的 LH、睾酮水平 , 从而促进患者自发排卵的恢复。

【关键词】 非肥胖型 ; 多囊卵巢综合征 ; 体成分 ; 胰岛素抵抗 ; 生活方式管理

基金项目 : 上海市科学技术委员会课题 (170H190400)

临床研究注册号 : ChiCTR-00C17011175

Life-style intervention improves insulin resistance and ovulation in non-obese polycystic ovary syndrome patients based on the body composition analysis : a pilot study

Su Chunlin¹ , Tang Yuzhu² , Lin Jinfang¹

¹Obstetrics and Gynecology Hospital of Fudan University, Shanghai 200032, China ; ²Eden Outpatient, Shanghai 200040, China

Corresponding author: Lin Jinfang, Email: linjinfang2002@126.com, Tel: +86-15921516258

【 Abstract 】 **Objective** To explore the effect of life-style intervention on non-obese polycystic ovary syndrome (PCOS) patients. **Methods** This was a prospective self-control study. Forty-three cases of non-obese [$18.5 \text{ kg/m}^2 \leq \text{body mass index (BMI)} < 24.0 \text{ kg/m}^2$] PCOS patients were enrolled from May 2017 to March 2018 in Obstetrics and Gynecology Hospital of Fudan University. The individualized dietary and exercise lifestyle intervention was formulated based on the body composition. After 12 weeks, the correlations among body composition data, insulin resistance, reproductive hormone improvement , and ovulation recovery were analyzed. **Results** Before intervention, 21 of 43 non-obese PCOS patients had normal body fat rate, 22 patients (51.2%) had higher body fat rate than normal, 17 patients had normal standard proportion of skeletal muscle weight (90%–110%), and 26 patients (60.5%) had lower standard proportion of skeletal muscle weight. Correlation analysis showed that fasting insulin (FINS) and homeostasis model assessment-insulin resistance (HOMA-IR) were positively correlated with body fat rate ($r=0.442$, $P=0.003$; $r=0.395$, $P=0.010$, respectively), and negatively correlated with the standard proportion of

skeletal muscle weight ($r=-0.492$, $P=0.001$; $r=-0.536$, $P<0.001$, respectively). After 12 weeks of lifestyle intervention, the body fat rate of non-obese PCOS patients decreased significantly ($P<0.01$); standard proportion of skeletal muscle weight and skeletal muscle weight increased significantly ($P<0.001$); HOMA-IR decreased significantly ($P<0.001$); level of luteinizing hormone (LH) and decreased significantly ($P=0.005$, $P=0.004$); and 31 (70%) patients recovered with spontaneous ovulation ($P<0.001$). Correlation analysis showed that: 1) after treatment, standard proportion of skeletal muscle weight in non-obese PCOS patients was negatively correlated with HOMA-IR ($r=-0.512$, $P=0.001$), and insulin-under-curve-area ($r=-0.421$, $P=0.007$); 2) after treatment, the body fat rate was positively correlated with LH and total testosterone ($r=0.455$, $P=0.003$; $r=0.377$, $P=0.015$); after treatment, standard proportion of skeletal muscle weight was negatively correlated with total testosterone ($r=-0.307$, $P=0.048$); 3) after treatment, the LH was positively correlated with HOMA-IR ($r=0.39$, $P=0.011$); 4) regression analysis showed that the recovery of spontaneous ovulation was closely related to the decrease of body weight, the increase of skeletal muscle standard proportion and the decrease of area under insulin curve ($P=0.016$, $P=0.004$, $P=0.003$). **Conclusion** Insulin resistance in non-obese PCOS patients is closely related to the increase of body fat rate and the decrease of the standard proportion of skeletal muscle weight. Individualized lifestyle interventions based on body composition results (focused on increasement of skeletal muscles) can increase insulin sensitivity, reduce LH and testosterone levels in non-obese PCOS patients, and promote the recovery of spontaneous ovulation.

【Key words】 Non-obese ; Polycystic ovary syndrome ; Body composition ; Insulin resistance ; Lifestyle intervention

Fund program : Shanghai Science and Technology Commission (170H190400)

Trial registration: ChiCTR-OOC17011175

· 临床研究 ·

DOI : 10.3760/cma.j.cn101441-20190619-00263

收稿日期 2019-09-05 本文编辑 李天琦

引用本文：张宁，张建霞，杨惠鸿. 基于 microRNA 表达的多囊卵巢综合征患者痰湿证生物标志物的初筛[J]. 中华生殖与避孕杂志，2020，40(9)：723-728. DOI: 10.3760/cma.j.cn101441-20190619-00263.

基于 microRNA 表达的多囊卵巢综合征患者痰湿证生物标志物的初筛

张宁 张建霞 杨惠鸿

山东中医药大学, 济南 250014

通信作者: 张宁, Email: ning_zhang1975@163.com, 电话:
+86-18766101739

【摘要】 目的 探索多囊卵巢综合征(PCOS)患者痰湿证的特征性生物标志物,为中医证候诊断的标准化提供理论依据。方法 采用队列研究的方法,收集2018年1月至2019年1月期间在山东中医药大学附属医院行体外受精(IVF)助孕治疗,年龄在20~37岁之间的不孕症患者。将患者分为对照组(A组,20例)、PCOS痰湿组(B组,20例)、PCOS非痰湿组(C组,20例)。采用qRT-PCR法检测3组患者血清、卵泡液、颗粒细胞中miR-183/200/223的表达水平,并用相关性分析评价其与痰湿证的关系。结果 血清中miR-223-3p在B组的相对表达量高于A组和C组,差异均有统计学意义(P 均 <0.001),并与胰岛素抵抗指数(HOMA-IR)呈正相关($r=0.595$, $P=0.04$)。卵泡液中miR-223-3p在B组的相对表达量高于A组($P<0.001$)及C组($P=0.002$),差异均有统计学意义。颗粒细胞中miR-183-5p在B组的相对表达量均高于A组($P=0.004$)和C组($P=0.012$),差异均有统计学意义,并与HOMA-IR呈正相关($r=0.732$, $P=0.007$);miR-200c-3p在B组的相对表达高于A组($P=0.002$)和C组($P=0.001$),差异均有统计学意义,并与HOMA-IR呈正相关($r=0.704$, $P=0.016$);miR-223-3p在B组的相对表达量高于A组($P<0.001$),在C组的相对表达量也高于A组($P=0.005$),差异均有统计学意义,且在B组的相对表达量与HOMA-IR呈正相关($r=0.547$, $P=0.042$);miR-223-5p在B组的相对表达量明显低于A组($P=0.001$),在C组的相对表达量也低于A组($P<0.001$),差异均有统计学意义,且B组的相对表达量与HOMA-IR呈负相关($r=-0.671$, $P=0.024$)。结论 PCOS痰湿证有明显的胰岛素抵抗特征,microRNA在PCOS痰湿证患者体内表达存在显著性差异。miR-183-5p、miR-200c-3p与miR-223-5p可能成为诊断PCOS痰湿证卵巢局部的特异性生物标志物。

【关键词】 微小RNA; 多囊卵巢综合征; 痰湿证; 血清; 卵泡液; 颗粒细胞

基金项目: 山东省重点研发计划项目(2017GSF19107);山东省中医经典名方协同创新中心开放课题(2018KFY17)

Screening the biomarkers of phlegm-dampness syndrome in patients with polycystic ovary syndrome based on microRNA expression

Zhang Ning, Zhang Jianxia, Yang Huihong

Shandong University of Traditional Chinese Medicine, Jinan 250014, China

Corresponding author: Zhang Ning, Email: ning_zhang1975@163.com, Tel: +86-18766101739

【 Abstract 】 Objective To explore the characteristic biomarkers of phlegm-dampness syndrome in patients with polycystic ovary syndrome (PCOS) to

provide a theoretical basis for the standardization of Traditional Chinese Medicine (TCM) syndrome diagnosis. **Methods** This study used the method of cohort study. From January 2018 to January 2019, female infertility patients aged between 20 years and 37 years were collected and treated with *in vitro* fertilization (IVF) in the Affiliated Hospital of Shandong University of Traditional Chinese Medicine. The cases were divided into control group (group A, $n=20$), PCOS phlegm and dampness group (group B, $n=20$), and PCOS non-phlegm and dampness group (group C, $n=20$). qRT-PCR was used to detect the expression levels of miR-183/200/223 in serum, follicular fluid and granulosa cells among the three groups, and the relationship between miR-183/200/223 and phlegm-dampness syndrome was evaluated by correlation analysis. **Results** In serum, the relative expression of miR-223-3p in group B was higher than that in group A ($P<0.001$) and group C ($P<0.001$), and the differences were statistically significant, and it was positively correlated with homeostasis model assessment of insulin resistance (HOMA-IR) ($r=0.595$, $P=0.04$). In follicular fluid, the relative expression of miR-223-3p in group B was higher than that in group A ($P<0.001$) and group C ($P=0.002$), and the differences were statistically significant. In granulosa cells, the relative expression of miR-183-5p in group B was higher than that in group A ($P=0.004$) and group C ($P=0.012$), and the differences were statistically significant, and it was positively correlated with HOMA-IR ($r=0.732$, $P=0.007$); the relative expression of miR-200c-3p in group B was higher than that in group A ($P=0.002$) and group C ($P=0.001$), and the differences were statistically significant, and it was positively correlated with HOMA-IR ($r=0.704$, $P=0.016$); the relative expression of miR-223-3p in group B was higher than that in group A ($P<0.01$), and the relative expression in group C was also higher than that in group A ($P=0.005$), and the relative expression of group B was positively correlated with HOMA-IR ($r=0.547$, $P=0.042$); the relative expression of miR-223-5p in group B was significantly lower than that in group A ($P=0.001$), and the relative expression in group C was also lower than that in group A ($P<0.001$), and the differences were statistically significant, and the relative expression of group B was negatively correlated with HOMA-IR ($r=-0.671$, $P=0.024$). **Conclusion** PCOS phlegm-dampness syndrome has obvious insulin resistance characteristics, and microRNA expression in PCOS phlegm-dampness syndrome patients has significant differences. miR-183-5p, miR-200c-3p and miR-223-5p may become specific biomarkers for the diagnosis of PCOS phlegm-dampness syndrome.

【Key words】 MicroRNA ; Polycystic ovary syndrome ; Phlegm-dampness syndrome ; Serum ; Follicular fluid ; Granulosa cells

Fund program : Shandong Key Research and Development Plan (2017GSF19107); Open Project of Collaborative Innovation Center of Classical Chinese Medicine Prescriptions in Shandong Province (2018KFY17)

DOI : 10.3760/cma.j.cn101441-20190919-00428

收稿日期 2019-11-11 本文编辑 宋培培

引用本文: 吴春香, 刁飞扬, 杨晓玉, 等. 精子 DNA 碎片指数对卵胞质内单精子显微注射周期助孕结局的影响[J]. 中华生殖与避孕杂志, 2020, 40(9): 729-733. DOI: 10.3760/cma.j.cn101441-20190919-00428.

精子 DNA 碎片指数对卵胞质内单精子 显微注射周期助孕结局的影响

吴春香 刁飞扬 杨晓玉 刘嘉茵

南京医科大学第一附属医院生殖医学科 210029

通信作者: 刘嘉茵, Email: jyliu_nj@126.com, 电话: +86-25-68302608

【摘要】 目的 比较精子 DNA 碎片指数 (DFI) 对因男方因素行卵胞质内单精子显微注射 (ICSI) 周期临床和实验室指标的影响, 探讨 DFI 与临床助孕结局的关系。方法 回顾性队列研究分析 2016 年 1 月至 2017 年 12 月期间于南京医科大学第一附属医院生殖医学科因男方因素进行 ICSI 助孕的 387 个周期的临床资料。所有周期均为首次进行 ICSI 助孕, 选用拮抗剂灵活方案促排卵。根据精子 DFI 的检测结果将所有周期分成 3 组, A 组: 精子核 DNA 完整性良好 ($DFI \leq 15\%$, 167 个周期), B 组: 精子核 DNA 完整性中等 ($15\% < DFI < 30\%$, 145 个周期), C 组: 精子核 DNA 完整性差 ($DFI \geq 30\%$, 75 个周期)。分别比较 3 组的基线资料和正常受精率、卵裂率、可移植胚胎率、优质胚胎率和单次取卵周期的累积活产率。结果 3 组间女方的年龄、体质指数 (BMI)、抗苗勒管激素 (AMH)、卵泡刺激素 (FSH) 及基础窦卵泡数 (AFC) 差异均无统计学意义 ($P > 0.05$), C 组的男方年龄 [(32.56 ± 5.70) 岁] 高于 A 组 [(30.27 ± 4.04) 岁, $P = 0.002$] 和 B 组 [(30.22 ± 4.81) 岁, $P = 0.003$]。A 组 ICSI 的正常受精率 (86.7%) 和可移植胚胎率 (88.3%) 均显著高于 B 组 (83.8%, $P = 0.0245$; 84.9%, $P = 0.0121$) 和 C 组 (82.1%, $P = 0.0056$; 84.4%, $P = 0.0227$), 但优质胚胎率和流产率组间差异均无统计学意义 ($P > 0.05$)。C 组的累积活产率 (74.7%) 较 A 组和 B 组下降 (82.0%、78.6%), 但差异无统计学意义 ($P > 0.05$)。结论 精子 DFI 是评估男性生育力的一个重要指标, 男方年龄增高可能会导致 DFI 升高。精子 DNA 损伤可能会影响胚胎发育及辅助生殖的结局, $DFI \geq 30\%$ 可能降低 ICSI 周期的累积活产率, 但还需更大样本的研究。

【关键词】 精子 DNA 碎片指数; 累积活产率; 卵胞质内单精子注射; 精子 DNA 完整性; 受精率; 可移植胚胎率

基金项目: 国家重点研发项目 (2016YFC100020、2016YFC100073); 江苏省临床生殖医学中心 (YXZXB2016001)

Effect of sperm DNA fragment index on the outcome of intracytoplasmic sperm injection cycles

Wu Chunxiang , Diao Feiyang , Yang Xiaoyu , Liu Jiayin

Reproductive Medicine Center of First Affiliated Hospital, Nanjing Medical University, Nanjing 210029, China

Corresponding author: Liu Jiayin, Email: jyliu_nj@126.com, Tel: +86-25-68302608

【 Abstract 】 Objective To explore the relationship between sperm DNA fragmentation index (DFI) and clinical outcomes of intracytoplasmic sperm injection (ICSI) cycles due to male factors. **Methods** We used a retrospective cohort to analyze the clinical data of 387 ICSI cycles in Reproductive Medicine Center of First Affiliated Hospital, Nanjing Medical University from January 2016 to December 2017. All patients were undergoing their first ICSI cycle, using a flexible antagonist protocol. Patients were divided into three groups according to sperm DFI, including group A, $DFI \leq 15\%$ ($n=167$), group B, $15\% < DFI < 30\%$ ($n=145$) and group C, $DFI \geq 30\%$ ($n=75$). Laboratory and clinical outcomes were compared among the three groups. **Results** There were no significant differences in maternal age, body mass index (BMI), anti-Müllerian hormone (AMH), follicle-stimulating hormone (FSH) and antral follicle count (AFC) among the three groups ($P > 0.05$). The males in group C [(32.56 ± 5.70) years] were older than those in group A and group B [(30.27 ± 4.04) years, $P = 0.002$; (30.22 ± 4.81) years, $P = 0.003$]. The fertilization rate (86.7%) and the rate of transplantable embryos (88.3%) in group A were significantly increased compared with group B (83.8%, $P = 0.024$; 84.9%, $P = 0.012$) and group C (82.1%, $P = 0.005$; 84.4%, $P = 0.022$). There was no significant difference in good-quality embryo rate and abortion rate ($P > 0.05$). The cumulative live birth rate was decreased in group C (74.7%) compared with group B (78.6%) and group A (82.0%), but there was no statistical difference ($P > 0.05$). **Conclusion** Sperm DFI is an important indicator for assessing male fertility, it may affect embryonic development and assisted reproductive outcomes. An increase in the age of the man may lead to an increase in DFI. $DFI \geq 30\%$ may reduce the cumulative live birth rate of ICSI, but a larger sample study is still needed.

【 Key words 】 Sperm DNA fragmentation index ; Cumulative live birth rate ; Intracytoplasmic sperm injection ; Sperm DNA integrity ; Fertility rate ; Rate of transplantable embryos

Fund program : National Key Research and Development Plan (2016YFC100020 ,2016YFC100073) ; Clinical Reproductive Medicine Center of Jiangsu Province (YXZXB2016001)

· 临床研究 ·

DOI : 10.3760/cma.j.cn101441-20190829-00388

收稿日期 2019-09-18 本文编辑 宋培培

引用本文：田汝辉，叶臻，郭通航，等. 施孕可辅助授精系统治疗男性不育症的多中心、前瞻性、开放、自身对照、随机交叉的临床研究[J]. 中华生殖与避孕杂志，2020，40(9)：734-740. DOI: 10.3760/cma.j.cn101441-20190829-00388.

施孕可辅助授精系统治疗男性不育症的多中心、前瞻性、开放、自身对照、随机交叉的临床研究

田汝辉¹ 叶臻² 郭通航³ 孙红芳¹ 吴煜⁴ 周莉娜⁴ 纪晓宁¹ 陈冬丽² 宋苏² 孙晓科³ 王一洲¹ 薛云婧¹ 周慧² 胡斌² 栾红兵³ 熊承良² 李铮¹

¹上海交通大学附属第一人民医院泌尿外科临床医学中心男科 上海交通大学泌尿外科研究所男性健康评估中心 上海市生殖医学重点实验室 201620；²华中科技大学同济医学院生殖医学中心，武汉 430030；³安徽省立医院生殖中心，合肥 230001；⁴上海交通大学附属第一人民医院辅助生殖科 201620

通信作者：熊承良，Email：clxiong951@sina.com，电话：+86-27-82742299；李铮，Email：lizhengboshi@sjtu.edu.cn，电话：+86-21-63240090*4566

【摘要】 目的 与自然性交法比较，评价施孕可辅助授精系统治疗不育症的安全性和有效性。方法 采用多中心、开放、自身对照、随机交叉的试验设计方法，分析了2017年7月至2018年9月期间在上海交通大学附属第一人民医院、华中科技大学同济医学院生殖医学中心和安徽省立医院就诊的无法自然妊娠的57对不育症夫妇，采用自身对照的方法，对比前后两个排卵期中使用本辅助授精系统方法与自然性交方法的差异。

符合入组条件的患者夫妇应用随机信封法来决定使用上述两种治疗方法的先后顺序。其中 A 类 29 对夫妇，第一个月的排卵期使用辅助授精系统的治疗方法，第二个月的排卵期使用自然性交法；B 类 28 对夫妇，第一个月的排卵期使用自然性交法，第二个月的排卵期使用辅助授精系统的治疗方法。所有完成辅助授精系统的夫妇的资料汇总为试验组数据，同时完成自然性交的夫妇的资料汇总为对照组数据，进行自身对照比较，采用妇科阴道检查、白带常规检查、性交后试验对宫颈管内活动精子数量评分、妊娠率比较等方法验证本辅助授精系统应用的安全性和有效性。结果 本研究完成试验的有效受试者共 54 对，其中 A 类 26 对夫妇，B 类 28 对夫妇。有效性评价方面，性交后试验结果显示，试验组活动精子评分值为 6.11 ± 3.00 ，对照组活动精子评分值为 1.22 ± 0.79 ，试验组的活动精子评分值是对照组的 5 倍 ($P < 0.001$)，明显优于对照组。受试者中有 7 例使用本辅助授精系统后成功妊娠，妊娠率为 13.0%；其中 6 例已生育健康子代，1 例自然流产，无受试者采用自然性交法后妊娠。安全性评价方面，试验组和对照组阴道一般妇科检查及阴道白带常规检查结果显示，试验组与对照组检查结果无差异。完成试验的 54 对有效受试者均能顺利使用本辅助授精系统放置含有精液的储精囊并在 6 h 内使用拉线顺利取出，无明显不适。结论 施孕可辅助授精系统有效治疗不育症，显著提高进入宫颈内的前向运动精子数量，显著提高妊娠率。安全无创、简便易行，患者可轻松自行操作，能够满足临床应用需要。

【关键词】 辅助授精系统； 男性不育症； 有效性； 安全性

Multi-center, prospective, open self-controlled, randomly crossed trial on the treatment with the conception aid kit in male infertility

Tian Ruhui¹, Ye Zhen², Guo Tonghang³, Sun Hongfang¹, Wu Yu⁴, Zhou Lina⁴, Ji Xiaoning¹, Chen Dongli², Song Su², Sun Xiaoke³, Wang Yizhou¹, Xue Yunjing¹, Zhou Hui², Hu Bin², Luan Hongbing³, Xiong Chengliang², Li Zheng¹

¹ Andrology Department of Urology Clinic Medicine Center, Shanghai General Hospital, Shanghai Jiao Tong University; Men's Health Assessment Center, Institute of Urology, Shanghai Jiao Tong University; Shanghai Key Laboratory of Reproductive Medicine, Shanghai 201620, China ; ² Reproductive Medicine Center , Tongji Medical College, Huazhong University of Science and Technology, Wuhan 430030, China ; ³ Reproductive Center, Anhui Provincial Hospital, Hefei 230001, China; ⁴ Assisted Reproduction Shanghai General Hospital, Shanghai Jiao Tong University, Shanghai 201620, China

Corresponding author: Xiong Chengliang, Email: clxiong951@sina.com, Tel: +86-27-82742299 ; Li Zheng, Email: lizhengboshi@sjtu.edu.cn, Tel: +86-21-63240090*4566

【Abstract】 **Objective** To evaluate the safety and effectiveness of The Stork OTC conception aid kit for the treatment of male infertility compared with natural sexual intercourse. **Methods** A multi-center, prospective, open, self-controlled, randomly crossed trial was performed in 57 infertility couples who were unable to naturally conceive, and were selected in Shanghai General Hospital, Shanghai Jiao Tong University, Reproductive Medicine Center, Tongji Medical College, Huazhong University of Science and Technology and Anhui Provincial Hospital from July 2017 to September

2018. Patients were required to participate both the conception aid kit and natural sexual intercourse in two consecutive periods of ovulation. A random envelope method was used to determine the application sequences of two methods. Twenty-nine couples were treated with the conception aid kit in the first month of ovulation, and applied the natural sexual intercourse in the second month of ovulation as group A. Twenty-eight couples were applied the natural sexual intercourse in the first month of ovulation, and were treated with the conception aid kit in the second month of ovulation as group B. Test results collected from all couples who used the conception aid kit were categorized as the test group data. Meanwhile, test results out of those couples who completed natural sexual intercourse were collected as control group data. Compared with its self-controlled natural sexual intercourse two months before and after, the effectiveness and safety of the conception aid kit was verified by general vaginal examination, routine leucorrhea examination, motile sperm score from post coital test (PCT), pregnancy rate comparison and other methods. **Results** The trial was conducted at three clinical trial centers. A total of 57 infertility couples were enrolled. A total of 54 couples were validated eventually including 26 couples in group A and 28 infertility couples in group B. Effectiveness was evaluated. The PCT results showed that the sperm score of test group was 6.11 ± 3.00 , and the score of the sperm score of control group was 1.22 ± 0.79 . The motile sperm score of test group was 5 times ($P < 0.001$) than that in control group. In the follow-up, 7 (13.0%) of the couples successfully achieved pregnancy with the conception aid kit, 6 (85.7%) of them had healthy offspring, 1 (14.3%) had spontaneous abortion. No couples were pregnant after natural sexual intercourse. Safety was evaluated. The general examination of the vagina and the routine tests of the vaginal leukorrhea showed no difference between test group and control group. All 54 effective couples who completed the test can successfully use the conception aid kit to place the seminal vesicles containing semen and remove them with the attached pulling thread on time without obvious discomfort. **Conclusion** The Stork OTC conception aid kits can effectively treat infertility, significantly increase the number of forward-moving sperm entering the cervix, and significantly increase the pregnancy rate. It is safe, non-invasive, simple, can be easily operate by patients themselves, and meets the needs of clinical applications.

【Key words】 Conception aid kit ; Male infertility ; Effectiveness ; Safety

· 临床研究 ·

DOI : 10. 3760/cma. j. cn101441-20200225-00083

收稿日期 2020-03-04 本文编辑 宋培培

引用本文 刘佩意, 朱嘉辉, 袁冠湘, 等. 男性夜间睡眠时长和精液质量的关联研究[J]. 中华生殖与避孕杂志, 2020, 40(9): 741-749. DOI: 10. 3760/cma. j. cn101441-20200225-00083.

男性夜间睡眠时长和精液质量的关联研究

刘佩意¹ 朱嘉辉² 袁冠湘² 张凯凯² 曾昱兴² 潘海滨² 周琦³ 刘瑜³ 程锦泉²

¹华中科技大学同济医学院公共卫生学院, 武汉 430030; ²深圳市疾病预防控制中心 518055; ³深圳市人民医院 518020

通信作者: 程锦泉, Email: cjinquan@szcdc.net, 电话: +86-755-25626488

【摘要】 目的 探讨夜间睡眠时长和精液质量参数的关联性。方法 采用横断面研究, 于 2017 年 8 月至 2018 年 8 月期间在深圳市人民医院生殖中心对 3357 名男性的夜间睡眠时长、入睡时间和入睡时长进行问卷调查, 采用计算机辅助精液分析系统 (CASA) 对精液质量进行分析获得精液质量参数, 运用多元线性回归分析夜间睡眠质量与精液质量参数之间的关系, 并根据年龄和体质质量指数 (BMI) 分层进一步探讨夜间睡眠时长与精液质量参数的关联性。结果 以夜间睡眠时长 6~8 h 组为对照, 在校正了年龄和 BMI、禁欲时间、运动、饮酒和吸烟后, 结果显示夜间睡眠时长 ≥ 8 h 人群的精子前向运动率和总活动率分别为 49.15% 和 59.49%, 较对照组降低, 所对应的回归系数 [95% 置信区间 (CI)] 分别是 -3.16 (-5.77~-0.55) 和 -3.22 (-5.93~-0.51); 与入睡时长最短组 (<10 min) 相比, 入睡时长的增加与精子前向运动率的降低有关 ($P=0.045$), 入睡时长 31~60 min 组的男性精子总活动率也明显较 <10 min 组明显降低 ($\beta=-3.80$, 95% CI=-6.54~-1.06, $P=0.007$)。进一步分层分析显示, 在 35 岁~40 岁的研究对象中, 夜间睡眠时长 <6 h 的男性精子前向活动率较 6~8 h 组降低 ($\beta=-4.01$, 95% CI=-7.84~-0.18, $P=0.04$); 在年龄 ≥ 40 岁的研究对象中, 夜间睡眠时长 ≥ 8 h 的男性精子总数均较 6~8 h 组降低 (变化百分比: -47.84%, 95% CI=-72.29%~-2.19%, $P=0.04$)。BMI ≥ 24 kg/m² 且夜间睡眠时长 ≥ 8 h 的男性精子前向活动率和总活动率均较 BMI ≥ 24 kg/m² 但夜间睡眠时长 6~8 h 组降低, 对应的回归系数分别是 $\beta=-5.75$, 95% CI=-10.40~-1.10, $P=0.02$ 和 $\beta=-6.85$, 95% CI=-11.69~-2.00, $P=0.01$ 。结论 在年龄 ≥ 40 岁或 BMI ≥ 24 kg/m² 的人群中, 夜间睡眠时长 ≥ 8 h 与精子前向运动率和总活动率降低有关。

【关键词】 年龄; 体质质量指数; 精液质量; 夜间睡眠时长

Association between nighttime sleep duration and semen quality

Liu Peiyi¹, Zhu Jiahui², Yuan Guanxiang², Zhang Kaikai², Zeng Yuxing², Pan Haibin², Zhou Qi³, Liu Yu³, Cheng Jinquan²

¹ School of Public Health, Tongji Medical College, Huazhong University of Science and Technology, Wuhan 430030, China ; ² Shenzhen Center for Disease Control and Prevention, Shenzhen 518055, China ; ³ Shenzhen People's Hospital, Shenzhen 518020, China

Corresponding author: Cheng Jinquan, Email: cjinqun@szcdc.net, Tel: +86-755-25626488

【Abstract】 Objective To explore the association between nighttime sleep duration and semen quality. **Methods** By using a cross-sectional study, 3357 men were investigated by questionnaire for nighttime sleep duration, the time of falling asleep and falling asleep duration in the Reproductive Center of Shenzhen People's Hospital from August 2017 to August 2018. Semen quality parameters were obtained by computer-aided semen analysis system (CASA). Multiple linear regression was used to analyze the relationship between nighttime sleep duration and semen quality parameters. According to age and body mass index (BMI) stratification, the relationship between nighttime sleep duration and semen quality parameters was further discussed. **Results** Compared with males with nighttime sleep duration between 6–8 h, the sperm progressive motility and total motility were 49.15% and 59.49%, respectively, which were significantly lower in the males with nighttime sleep duration ≥ 8 h after adjusting for age, BMI, abstinence time, exercise, drinking and smoking, with regression coefficients, $\beta = -3.16$, 95% confidence interval (CI) = -5.77 – -0.55 and $\beta = -3.22$, 95% CI = -5.93 – -0.51 , respectively. Compared with the shortest duration of falling asleep group (< 10 min), the increase of falling asleep duration was related to the decrease of sperm progressive motility ($P = 0.045$). The total sperm motility of falling asleep duration between 31–60 min group was also significantly lower than that of the shortest falling asleep duration group ($\beta = -3.80$, 95% CI = -6.54 – -1.06 , $P = 0.007$). Further stratification analysis showed that among the subjects aged 35 to 39 years, the sperm progressive motility of men with nighttime sleep duration less than 6 h was lower than that of 6–8 h group ($\beta = -4.01$, 95% CI = -7.84 – -0.18 , $P = 0.04$). And among the subjects aged more than 40 years, the total sperm number of the men who slept ≥ 8 h at night was lower than that of the men with nighttime sleep duration between 6–8 h (percentage changes: -47.84% , 95% CI = -72.29% – -2.19% , $P = 0.04$). The progressive and total sperm motility of men with BMI ≥ 24 kg/m² and nighttime sleep duration ≥ 8 h were lower than those with BMI ≥ 24 kg/m² in 6–8 h nighttime sleep duration group, and the corresponding regression coefficients were $\beta = -5.75$, 95% CI = -10.40 – -1.10 , $P = 0.02$ and $\beta = -6.85$, 95% CI = -11.69 – -2.00 , $P = 0.01$. **Conclusion** In men ≥ 40 years old or BMI ≥ 24 kg/m², the nighttime sleep duration ≥ 8 h were associated with the decreased sperm progressive motility and total motility.

【Key words】 Age ; Body mass index ; Semen quality ; Nighttime sleep duration

·循证医学·

DOI : 10.3760/cma.j.cn101441-20190902-00394

收稿日期 2019-09-06 本文编辑 王李艳

引用本文: 张宝丽, 张莉莉, 杨媛, 等. 坤泰胶囊用于治疗卵巢储备功能低下有效性的 Meta 分析[J]. 中华生殖与避孕杂志, 2020, 40(9): 750-755. DOI: 10.3760/cma.j.cn101441-20190902-00394.

坤泰胶囊用于治疗卵巢储备功能低下有效性的 Meta 分析

张宝丽 张莉莉 杨媛 孙晓燕 杨柳 王丽蓉 张学红

兰州大学第一医院生殖医学专科医院 730000

通信作者: 张学红, Email: 1228117987@qq.com, 电话: +86-18919117065

【摘要】 目的 系统评价坤泰胶囊用于治疗卵巢储备功能低下的疗效。方法 计算机检索中国知网、中国生物医学数据库、万方数据库、维普数据库、PubMed、EMbase 数据库以及临床试验注册平台(<https://clinicaltrials.gov/>), 搜索关于使用坤泰胶囊治疗卵巢储备功能低下的文献, 检索时间为建库至 2019 年 7 月。由 2 位评价员独立进行文献筛选、信息提取和风险评价后, 采用 Rev Man 5.3 软件进行 Meta 分析。结果 最后纳入符合标准随机对照试验(RCT)的文献共 14 篇, 共纳入 1191 例患者。Meta 分析结果显示: 坤泰胶囊干预组与对照组相比, 对于患者治疗前后基础窦卵泡数 (MD=0.83, 95% CI=0.32~1.35, $P=0.001$) 差异有统计学意义。两组血清抗苗勒管激素 (AMH) 水平 (MD=0.11, 95% CI=-0.04~0.26, $P=0.14$) 和 Kupperman 评分 (MD=-2.67, 95% CI=-7.43~2.10, $P=0.27$) 水平差异无统计学意义。结论 坤泰胶囊用于治疗卵巢储备功能低下患者可以有效提高基础窦卵泡数, 但是不能显著提升患者血清 AMH 水平及改善 Kupperman 评分。但受纳入研究的数量和质量限制, 上述结论尚需要开展更多研究予以验证。

【关键词】 卵巢储备功能低下; 卵巢早衰; 卵巢功能; 坤泰胶囊; Meta 分析

基金项目: 甘肃省自然科学基金(18JR3RA340)

Efficacy of Kuntai capsule for treating ovarian reserve dysfunction: a Meta-analysis

Zhang Baoli , Zhang Lili , Yang Yuan , Sun Xiaoyan , Yang Liu , Wang Lirong , Zhang Xuehong

The Reproductive Medicine Special Hospital of the 1st Hospital of Lanzhou University, Lanzhou 730000, China

Corresponding author: Zhang Xuehong, Email : 1228117987@qq.com, Tel: +86-18919117065

【 Abstract 】 Objective To systematically evaluate the efficacy of Kuntai capsule in the treatment of ovarian reserve dysfunction. **Methods** CNKI, CBM, Wanfang database, VIP database, PubMed, EMbase database , and clinical trial registration (<https://clinicaltrials.gov/>) were searched from inception to July 2019 to collect randomized controlled trials (RCTs) about Kuntai capsule in treatment of ovarian reserve dysfunction. Literatures were screened independently by two evaluators. After information extraction and risk assessment, meta analysis was performed by Rev Man 5.3 software. **Results** A total of 14 randomized controlled trials (RCTs) involving 1191 patients were included. Meta analysis showed that there were significant differences in the number of antral follicle count (MD=0.83, 95% CI=0.32-1.35, $P=0.001$) between Kuntai capsule group and control group. There was no significant difference in serum anti-Müllerian hormone (AMH) level (MD=0.11, 95% CI=-0.04-0.26, $P=0.14$) and Kupperman score (MD=-2.67, 95% CI=-7.43-2.10, $P=0.27$) between the two groups. **Conclusion** Kuntai capsule can effectively increase the number of antral follicle count for patients with ovarian reserve dysfunction, but there was no significant improvement in serum AMH level and it can not reduce the Kupperman score. However, due to the quantity and quality of the study, the above conclusions need to be verified by more research.

【 Key words 】 Ovarian reserve dysfunction ; Premature ovarian failure ; Ovarian function ; Kuntai capsule ; Meta analysis

Fund program : Natural Science Foundation of Gansu Province (18JR3RA340)

· 临床报道 ·

DOI : 10.3760/cma.j.cn101441-20190904-00400

收稿日期 2019-09-12 本文编辑 孙敏

引用本文 郭丽娜, 王楠, 吕翠婷, 等. 卵巢低反应患者黄体期促排卵行体外受精/卵胞质内单精子显微注射助孕临床结局分析 [J]. 中华生殖与避孕杂志, 2020, 40(9): 756-760. DOI: 10.3760/cma.j.cn101441-20190904-00400.

卵巢低反应患者黄体期促排卵行体外受精 /卵胞质内单精子显微注射助孕临床结局 分析

郭丽娜 王楠 吕翠婷 贾新转 董翠

河北医科大学第四医院, 石家庄 050011

通信作者 郭丽娜, Email: sjzguolina@163.com 电话: +86-311-86095350

【摘要】 目的 探讨卵巢低反应(POR)患者应用黄体期促排卵(LPS)方案行体外受精/卵胞质内单精子显微注射(IVF/ICSI)助孕的临床效果。方法 收集2013年6月至2018年12月期间于河北医科大学第四医院生殖医学科应用LPS方案行IVF/ICSI助孕的134例POR患者临床资料,对其临床、实验室数据及冻融胚胎移植的临床妊娠结局进行回顾性分析。结果 134例患者共行142个LPS促排卵周期,其中未取卵周期8个,占5.63%(8/142);未获卵周期11个,占7.75%(11/142);无冷冻胚胎周期占比37.32%(53/142),总周期取消率50.70%(72/142)。尿促性腺激素(hMG)使用时间是 (10.04 ± 3.51) d,用量 $(2\ 330.00 \pm 890.48)$ IU。有24.64%(35/142)周期在扳机日孕酮降至 $1\ \mu\text{g/L}$ 以下。获卵数为 (3.13 ± 2.60) 枚,获卵率为76.04%(419/551); M_{II} 卵数为 (2.98 ± 2.25) 枚, M_{II} 卵率为86.63%(363/419);双原核(2PN)数为 (2.17 ± 1.69) 枚,2PN率为69.97%(254/363);可利用胚胎数为 (2.04 ± 1.53) 枚,可利用胚胎率为91.34%(232/254);优质胚胎数为1(0.2)枚,优质胚胎率为46.06%(117/254)。2016年6月前优质胚胎冷冻后,非优质胚胎进行培养,囊胚形成率为15.22%(7/46),2016年6月后可利用胚胎全部培养,囊胚形成率为41.98%(55/131)。50例患者共行60个冻融胚胎移植周期,移植周期临床妊娠率为41.67%(25/60),流产率为44.00%(11/25),活产率为23.33%(14/60)。结论 POR患者行LPS周期取消率较高,如有冷冻胚胎进行复苏移植可获得较满意临床妊娠率,但流产率较高。

【关键词】 卵巢低反应; 黄体期促排卵; 冻融胚胎移植

基金项目:河北省医学科学研究重点课题计划(20180555)

Clinical outcomes of luteal phase stimulation for *in vitro* fertilization/intracytoplasmic sperm injection treatment in poor ovarian responders

Guo Lina, Wang Nan, Lyu Cuiting, Jia Xinzhan, Dong Cui

The Fourth Hospital of Hebei Medical University, Shijiazhuang 050011, China

Corresponding author: Guo Lina, Email: sjzguolina@163.com, Tel: +86-311-86095350

【 Abstract 】 Objective To explore the clinical outcomes of luteal phase stimulation (LPS) for *in vitro* fertilization/intracytoplasmic sperm injection (IVF/ICSI) treatment in patients with poor ovarian response (POR). **Methods** Retrospective analysis was conducted on the clinical, laboratory data and clinical pregnancy outcome of frozen-thawed embryo transfer of 134 POR patients using LPS protocol for IVF/ICSI treatment in Reproductive Medical Center of the Fourth Hospital of Hebei Medical University from June 2013 to December 2018. **Results** Totally 142 IVF/ICSI cycles were completed in 134 POR patients. About 5.63% (8/142) cycles cancelled due to unsuitable follicle, 7.75% (11/142) were failed to obtain oocyte and 37.32% (53/142) had unsuitable embryos for freezing, the total cancellation rate reached 50.70%. The duration of human menopausal gonadotropin (hMG) used was (10.04±3.51) d and the used dosage was (2 330.00±890.48) IU. In 24.64% (35/142) cycles, progesterone decreased to less than 1 µg/L on the trigger day. The number of oocytes retrieved, M_{II} oocytes, two pronucleus (2PN), available embryos, high-quality embryos were 3.13±2.60, 2.98±2.25, 2.17±1.69, 2.04±1.53, 1(0.2), respectively. The rates of oocytes retrieved, M_{II} oocytes, 2PN, available embryos, high-quality embryos were 76.04% (419/551), 86.63% (363/419), 69.97% (254/363), 91.34% (232/254) and 46.06% (117/254), respectively. Before June 2016, high-quality embryos were frozen, and poor-quality embryos were cultured, the blastocyst formation rate was 15.22% (7/46). After June 2016, all available embryos were cultured, the blastocyst formation rate was 41.98% (55/131). In the following frozen-thawed embryo transfer cycles, the clinical pregnancy rate per transfer cycle was 41.67% (25/60), the abortion rate was 44.00% (11/25), and the live birth rate was 23.33% (14/60). **Conclusion** The cancellation rate of LPS protocol was high in POR patients. If there were frozen embryos for transfer, the clinical pregnancy rate would be satisfied, but the abortion rate was high.

【 Key words 】 Poor ovarian response ; Luteal phase stimulation ; Frozen-thawed embryo transfer

Fund program : Medical Scientific Research Key Program of Hebei Province (20180555)

· 临床报道 ·

DOI : 10. 3760/cma. j. cn101441-20190828-00384

收稿日期 2019-09-03 本文编辑 王李艳

引用本文 : 屈清华, 林奕, 雷莉, 等. 子宫肌壁间妊娠 9 例临床分析并文献复习[J]. 中华生殖与避孕杂志, 2020, 40(9): 761-766. DOI: 10. 3760/cma. j. cn101441-20190828-00384.

子宫肌壁间妊娠 9 例临床分析并文献 复习

屈清华 林奕 雷莉 孙文洁 胡晓吟 徐冬梅 潘赢政 杨霞 石
岩 郝丽娟

重庆市妇幼保健院生殖内分泌科 401147

通信作者:郝丽娟,Email:haolj2002@163.com,电话:+86-23-60354586

【摘要】 目的 探讨子宫肌壁间妊娠的高危因素、早期诊断及治疗方法,提高肌壁间妊娠的临床诊治水平。方法 回顾性分析 2015 年 1 月至 2019 年 7 月期间在重庆市妇幼保健院诊断为子宫肌壁间妊娠的 9 例临床资料,总结肌壁间妊娠的高危因素、临床表现、治疗结局。结果 9 例肌壁间妊娠患者中 6 例既往有人工流产术和宫腔、腹腔镜手术史,5 例有胚胎移植术史。9 例患者通过药物治疗、宫腹腔镜或经腹肌壁间妊娠物清除术后均保留了子宫完整性,1 例早孕合并肌壁间复合妊娠的患者经腹腔镜治疗后妊娠得以继续。结论 对具有高危因素患者应在妊娠早期就诊,提高对肌壁间妊娠的警惕性,宫腹腔镜联合探查术可快速明确诊断又可同时行微创手术,保留子宫完整性及生育能力,是治疗肌壁间妊娠的有效方法。

【关键词】 子宫肌壁间妊娠; 宫腔镜; 腹腔镜; 胚胎移植

基金项目:重庆市卫生局医学科研面上项目(2012-2-202)

Clinical analysis of 9 cases of intermural pregnancy and literature review

Qu Qinghua, Lin Yi, Lei Li, Sun Wenjie, Hu Xiaoyin, Xu Dongmei, Pan Yingzheng, Yang Xia, Shi Yan, Hao Lijuan

Department of Reproductive Endocrinology, Chongqing Health Center for Women and Children, Chongqing 401147, China

Corresponding author: Hao Lijuan, Email: haolj2002@163.com, Tel: +86-23-60354586

【Abstract】 **Objective** To analyze the high risk factors of intramural ectopic pregnancy, and to improve the clinical diagnosis and treatment of intramural ectopic pregnancy. **Methods** From January 2015 to July 2019, the clinical data of 9 patients with intramural pregnancy in Chongqing Maternal and Child Health Hospital were retrospectively analyzed. The high risk factors, clinical manifestations, treatment outcomes of intramural pregnancy were summarized. **Results** Nine patients with intramural pregnancy, 6 cases had previous history of abortion, uterine or abdominal

cavity surgery. Five cases had history of embryo transfer. The uterine integrity was preserved in 9 patients after treatment with medication, hysteroscopy, laparoscopy or transabdominal intramural pregnancy clearance. Pregnancy continued after laparoscopic treatment in a patient with early pregnancy complicated with intramural pregnancy. **Conclusion** Patients with high risk factors should be treated at the early stage of pregnancy. Hysteroscopy combined with laparoscopic exploration is an effective method for the treatment of intramural pregnancy, which can make a quick and definite diagnosis and perform minimally invasive surgery, and preserve uterine integrity and fertility.

【Key words】 Intramural pregnancy ; Hysteroscopy ; Laparoscopy ; Embryo transfer

Fund program : General Medical Research Projects of Chongqing Municipal Health Bureau(2012-2-202)

· 综述 ·

DOI : 10.3760/cma.j.cn101441-20200522-00300

收稿日期 2020-05-22 本文编辑 孙敏

引用本文 何翌晨, 吴琰婷, 黄荷凤. 抗苗勒管激素与女性生殖结局关系的研究进展[J]. 中华生殖与避孕杂志, 2020, 40(9): 767-772. DOI: 10.3760/cma.j.cn101441-20200522-00300.

抗苗勒管激素与女性生殖结局关系的研究进展

何翌晨¹ 吴琰婷² 黄荷凤¹

¹上海交通大学医学院附属国际和平妇幼保健院辅助生殖科, 上海胚胎

源性疾病重点实验室 200030 ;²上海交通大学医学院附属国际和平妇幼

保健院科教科 200030

通信作者: 黄荷凤, Email: huanghefg@sjtu.edu.cn, 电话:

+86-18017310186; 吴琰婷, Email: yanting_wu@163.com, 电话:

+86-18017316066

【摘要】 抗苗勒管激素(AMH)是一种二聚体糖蛋白,是转化生长因子- β (TGF- β)家族的一员。作为一种生物标志物,AMH被首次应用于卵巢储备的定量评估距今已有17

年, AMH 的应用范围已逐渐扩大。AMH 在卵巢内调控卵泡发育, 在性腺外也发挥重要的神经内分泌作用。AMH 与流产、活产、早产、妊娠期高血压疾病等生殖结局存在一定的相关性。现综述 AMH 与女性生殖结局关系的最新研究进展, 以期为妇产科临床工作开展提供参考依据。

【关键词】 抗苗勒管激素; 女性生殖; 生殖技术, 辅助; 生殖生理; 不良生殖结局

Research progress of anti-Müllerian hormone in female reproductive outcomes

He Yichen¹, Wu Yanting², Huang Hefeng¹

¹ Department of Reproductive Medicine, International Peace Maternity and Child Health Hospital, Shanghai Jiao Tong University School of Medicine, Shanghai Key Laboratory of Embryo Original Diseases, Shanghai 200030, China; ² Department of Research and Education, International Peace Maternity and Child Health Hospital, Shanghai Jiao Tong University School of Medicine, Shanghai 200030, China

Corresponding author: Huang Hefeng, Email: huanghefg@sjtu.edu.cn, Tel: +86-18017310186; Wu Yanting, Email: yanting_wu@163.com, Tel: +86-18017316066

【Abstract】 Anti-Müllerian hormone (AMH) is a dimeric glycoprotein and a member of the transforming growth factor-beta (TGF- β) family. It has been more than 17 years since the measurement of serum AMH as a biomarker first allowed the quantitative assessment of ovarian reserve. Meanwhile, the implication of AMH has been expanding. AMH regulates follicular development in the ovary and also plays an important neuroendocrine role outside the gonads. There are certain associations between AMH and reproductive outcomes such as miscarriage, live birth, preterm birth and hypertensive disorders in pregnancy. This article reviews the latest research progress of AMH in association with reproductive outcomes, with a view to provide a reference for the clinical work of obstetrics and gynecology.

【Key words】 Anti-Müllerian hormone; Female reproduction; Reproductive technology, assisted; Reproductive physiology; Adverse reproductive outcomes

·综述·

DOI: 10.3760/cma.j.cn101441-20190806-00344

收稿日期 2019-08-30 本文编辑 王李艳

引用本文: 朱灿灿, 刘召青, 齐念民. 人类卵巢组织冷冻保存与移植技术发展现状[J]. 中华生殖与避孕杂志, 2020, 40(9): 773-777. DOI: 10.3760/cma.j.cn101441-20190806-00344.

人类卵巢组织冷冻保存与移植技术发展现状

朱灿灿 刘召青 齐念民

上海坤爱生物科技股份有限公司 201318

通信作者:齐念民,Email:profQi@yahoo.com,电话:+86-21-34712636

【摘要】 肿瘤患者放、化疗治疗可能会导致卵巢功能紊乱、生育能力丧失,如何保护年轻肿瘤患者的生育力,提高愈后生活质量,是肿瘤治疗者面临的问题。卵巢组织冻存与移植可以恢复患者的生殖内分泌功能,是保护年轻肿瘤患者生育力的重要方法之一,为不适用于卵母细胞冻存和胚胎冻存患者的生育力保存提供了新的选择。近年来,有越来越多的健康婴儿借助卵巢组织移植技术出生,但该技术仍存在移植初期卵泡闭锁、再次引入肿瘤细胞的风险等问题。本文就卵巢组织冻存与移植技术的发展现状进行综述。

【关键词】 卵巢组织冻存; 生育力; 卵母细胞冷冻; 胚胎冷冻

基金项目:2017 上海市科委资助项目(1802H1B3000)

Development status for cryopreservation and transplantation of human ovarian tissue

Zhu Cancan, Liu Zhaoqing, Qi Nianmin

Shanghai Kunai Bio-Technology Co., Ltd, Shanghai 201318, China

Corresponding author: Qi Nianmin, Email: profQi@yahoo.com, Tel: +86-21-34712636

【Abstract】 The cancer patients may experience ovarian dysfunction and lose their fertility after radiotherapy or chemotherapy. Therefore, the oncologists face problems of how to protect reproductive function and improve their life quality of young female patients. Ovarian tissue cryopreservation and transplantation (OTCT) could restore the female reproductive endocrine and is one of the main methods for fertility preservation. This method provides a new way for patients who are not suitable for fertility preservation by oocyte cryopreservation and embryo cryopreservation. In recent years, there are many healthy births by OTCT. But, this method also has deficiencies, such as ischemic atresia after transplantation before rebuilding blood supply and risk of reintroducing the malignant cells after retransplantation. This paper reviews the development of OTCT.

【Key words】 Ovarian tissue cryopreservation; Fertility; Oocyte cryopreservation; Embryo cryopreservation

Fund program: Shanghai Municipal Science and Technology Fund (1802H1B3000)

·综述·

DOI: 10.3760/cma.j.cn101441-20191011-00451

收稿日期 2019-10-23 本文编辑 李天琦

引用本文：毛菁沁，侯振，崔毓桂，等. 子宫内膜异位症对卵泡颗粒细胞的影响[J]. 中华生殖与避孕杂志, 2020, 40(9): 778-781. DOI: 10.3760/cma.j.cn101441-20191011-00451.

子宫内膜异位症对卵泡颗粒细胞的影响

毛菁沁 侯振 崔毓桂 冒韵东

南京医科大学第一附属医院/江苏省人民医院/江苏省妇幼保健院 生殖

医学中心 210029

通信作者：冒韵东, Email: drmaoyd@aliyun.com, 电话: +86-25-68302604

【摘要】 子宫内膜异位症患者常伴有卵泡发育迟缓、卵母细胞成熟障碍等问题，严重影响患者生育能力。子宫内膜异位症患者颗粒细胞凋亡及氧化应激事件的发生、细胞能量代谢及类固醇合成能力受损可能是其卵泡发育异常、卵母细胞质量下降的原因。而卵巢内膜异位囊肿引起炎症反应发生，使卵泡过度激活、卵巢皮质纤维化，直接影响卵巢储备。本文对子宫内膜异位症患者卵泡颗粒细胞凋亡及氧化应激事件、类固醇激素合成及能量代谢功能异常进行讨论，并从炎症反应的角度解释内膜异位囊肿对卵巢储备的不利影响。

【关键词】 子宫内膜异位症； 颗粒细胞； 氧化应激； 卵泡发育； 能量代谢

基金项目：国家重点研发项目(2017YFC1001604)；国家自然科学基金(81671438、81730041)；江苏省卫生厅人才项目(FRC201215、FRC201303)

Effect of endometriosis on follicular granulosa cells

Mao Jingqin, Hou Zhen, Cui Yuguai, Mao Yundong

Clinical Center of Reproductive Medicine, the First Affiliated Hospital of Nanjing Medical University/Jiangsu Province Hospital/Jiangsu Women and Children Health Hospital, Nanjing 210029, China

corresponding author: Corresponding author: Mao Yundong, Email: drmaoyd@aliyun.com, Tel: +86-25-68302604

【Abstract】 Patients with endometriosis are often associated with follicular growth retardation and oocyte maturation disorders, severely affecting patient fertility. In patients with endometriosis, the occurrence of apoptosis and oxidative stress events in granulosa cells, impaired cellular energy metabolism and steroid synthesis in patients with endometriosis may be the cause of abnormal follicular development and decreased oocyte quality. The inflammatory response caused by endometrioma, which afterwards leads excessive activation of follicles and fibrosis of the ovarian cortex,

which directly reduces ovarian reserve. This article discusses the oxidative stress and apoptosis of follicle granulosa cells, steroid hormone synthesis, energy metabolism abnormality in patients with endometriosis, and explains the adverse effects of endometrioma on ovarian reserve from the perspective of inflammatory response.

【Key words】 Endometriosis ; Granulosa ; Oxidative stress ; Folliculogenesis ; Energy metabolism

Fund program : National Key R&D Program of China (2017YFC1001604); National Natural Science Foundation of China (81671438, 81730041); Talent Projection of Jiangsu Commission of Health (FRC201215, FRC201303)

·综述·

DOI : 10. 3760/cma. j. cn101441-20190731-00336

收稿日期 2019-08-15 本文编辑 王李艳

引用本文 : 张月鑫, 李玲君, 崔毓桂. 葡萄糖代谢与卵母细胞成熟[J]. 中华生殖与避孕杂志, 2020, 40(9): 782-787. DOI: 10. 3760/cma. j. cn101441-20190731-00336.

葡萄糖代谢与卵母细胞成熟

张月鑫 李玲君 崔毓桂

南京医科大学第一附属医院生殖医学中心 210029

通信作者 : 崔毓桂 , Email : cuiygnj@njmu.edu.cn , 电话 : +86-13813843650

【摘要】 卵母细胞成熟所消耗的能量部分来源于卵丘细胞,但主要由卵母细胞线粒体产生;能量代谢的底物为葡萄糖,其次为脂质和氨基酸代谢。卵丘-卵母细胞复合物(cumulus-oocyte complex, COC)中葡萄糖代谢有四种途径,即糖酵解途径、磷酸戊糖途径、己糖胺生物合成途径和多元醇途径。糖酵解途径是卵丘细胞主要代谢途径,在无氧或低氧时的产能效率低,有氧条件下卵母细胞主要通过线粒体的氧化磷酸化途径代谢葡萄糖,产能效率最高。卵母细胞自身直接代谢葡萄糖的能力弱,需要利用卵丘细胞糖酵解所产生的丙酮酸作为能量代谢的底物。卵母细胞成熟包括核成熟和胞质成熟,都是能量依赖的过程。本文综述卵母细胞糖代谢及其对卵母细胞成熟、核质成熟同步化的作用,可望通过调节糖代谢方式实现优化卵母细胞体外成熟方案,有益于改善体外成熟卵母细胞的质量和发育潜能。

【关键词】 卵母细胞; 糖代谢; 卵丘细胞; 核成熟; 胞质成熟

基金项目 :国家重点研发计划(2017YFC1001602) ;国家自然科学基金(81730041) ;
江苏省卫生厅科教强卫工程 (YXZXB2016001)

Research progress of glucose metabolism in oocyte maturation

Zhang Yuexin , Li Lingjun , Cui Yugui

Clinical Center of Reproductive Medicine, the First Affiliated Hospital of Nanjing Medical University, Nanjing 210029, China

Corresponding author: Cui Yugui, Email: cuiygnj@njmu.edu.cn, Tel: +86-13813843650

【Abstract】 The energy consumed by oocyte maturation is partly derived from cumulus cells, but is mainly produced by oocyte mitochondria; the substrate for energy metabolism is glucose, followed by lipid and amino acids. Glucose can be metabolized by four pathways, namely glycolytic pathway, pentose phosphate pathway, hexosamine biosynthetic pathway and polyol pathway. The glycolytic pathway is one of the main metabolic pathways, but its efficiency is low when it is anaerobic or hypoxic. When it is aerobic, oocytes mainly metabolize glucose through the oxidative phosphorylation pathway of mitochondria. This paper reviews the role of glucose metabolism in oocyte maturation and the synchronization of oocyte nuclear and cytoplasmic maturation. It is expected to optimize the protocol of oocyte *in vitro* maturation by regulating glucose metabolism, which is beneficial to improve the quality and development potential of *in vitro* maturation oocyte.

【Key words】 Oocyte ; Glucose metabolism ; Cumulus cells ; Nuclear maturation ; Cytoplasmic maturation

Fund program : National Key Research and Development Plan of China (2017YFC1001602) ; National Natural Science Foundation of China (81730041) ; Revitalizing the Key Talent's Subsidy Project in Science and Education, Jiangsu Province, China (YXZXB2016001)