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编 辑

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编辑委员会
200237,上海市老沪闵路779号
电话:(021)64438169/64438975
Email:randc@sibpt.cn
http://zhshybyzz.yiigle.com

总编辑

乔 杰

编辑部主任

王 健

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目 次

卷 首 语

生命之光映新程 奋楫争先谱华章 封二
乔杰

述 评

我国生殖健康领域“十四五”进展及“十五五”展望 1
乔杰

规范与标准

个体化胚胎移植临床实践指南(2026版) 6
中国医师协会生殖医学专业委员会 个体化胚胎移植临床实践指南编写专家组

临床研究

嵌合型特纳综合征患者辅助生殖助孕结局分析 23
胡曼玉 杨宸 郑威 闫一璇 俎若雯 杨悦 张俊伟
任炳楠 管一春
系统性免疫炎症指数及系统性炎症反应指数对辅助生殖
结局的影响及预测价值 31
桑晨 曾湘辉 贾佳 陈浩 王芳

实验研究

DHEA诱导的PCOS小鼠模型脑部免疫状态的改变及其潜在的
慢性炎症机制 44
罗靖之 吴璟淳 衡黛 张一丹 黄伯昀 李娜 周玖月
梁朝远 杭婧 王艳 张浩琳

循证医学

2014—2024年中国生殖医学临床实践指南和专家共识的
系统评价 52
孙小燕 金梦寒 赢佳 杨柳 杨慎敏 顾崇娟 钟禹农 霍然
葛龙 孟庆霞
异常受精胚胎妊娠结局的系统评价与meta分析 58
李昕妍 李甫云 柴三明 王丽 桑元坤 王琰 谢广妹

新 技 术

染色体构象核型分析技术在生殖领域的应用 66
鲍晓 孙莹璞

综 述

卵巢储备功能减退患者辅助生殖助孕方案研究进展·····	71
符雨珂 汪荷洁 于桂婷 蔡婕 张伟峰	
子宫腺肌病生育力保护的中医药研究进展·····	77
李丹云 周洁芸 孙小淳 钟瑞华 庄梦斐 黄圣惠 张婷婷 曹阳	
基于巨噬细胞极化探讨中药治疗多囊卵巢综合征的免疫机制研究进展·····	83
甄喜娜 于艺 相珊 连方	
促性腺激素释放激素神经元在多囊卵巢综合征病理生理机制作用的 研究进展·····	89
和雪琴 娄艳茹 李佳林 杨蕊	
整合素蛋白调控胚胎种植的机制研究进展·····	94
高利利 刘加宾 苗苗 王平 王燕 辛晓凤 张庆军 曹江 吴春蕾	
《中华生殖与避孕杂志》第三届编辑委员会成员名单 ·····	43
《中华生殖与避孕杂志》第三届通讯编辑委员会成员名单 ·····	88
《中华生殖与避孕杂志》稿约 ·····	封三
本期责任编辑 乔杰 本期责任编辑 李天琦 本期责任编辑 年丽红	

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Editor-in-Chief

Qiao Jie

Managing Director

Wang Jian

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CONTENTS IN BRIEF

Editorial

Progress in China's reproductive health sector during the 14th Five-Year

Plan period and prospects for the 15th Five-Year Plan period 1

Qiao Jie

Standards and Specifications

Clinical practice guideline on individualized embryo transfer (2026) 6

Reproductive Medicine Professional Committee of Chinese Medical Doctor Association, Expert Group for the Development of the Clinical Practice Guideline on Individualized Embryo Transfer

Clinical Studies

Analysis of assisted reproductive outcomes in patients with mosaic

Turner syndrome 23

Hu Manyu, Yang Chen, Zheng Wei, Yan Yixuan, Zu Ruowen, Yang Yue,
Zhang Junwei, Ren Bingnan, Guan Yichun

Impact and predictive value of the systemic immune-inflammation index and the systemic inflammation response index on assisted reproductive outcomes 31

Sang Chen, Zeng Xianghui, Jia Jia, Chen Hao, Wang Fang

Laboratory Study

DHEA-induced alteration of central immune status in a mouse model of PCOS and its underlying chronic inflammatory mechanisms 44

Luo Jingzhi, Wu Jingchun, Heng Dai, Zhang Yidan, Huang Boyun, Li Na,
Zhou Jiuyue, Liang Zhaoyuan, Hang Jing, Wang Yan, Zhang Haolin

Evidence-based Medicines

Chinese clinical practice guidelines and expert consensus in reproductive medicine from 2014 to 2024: a systematic review 52

Sun Xiaoyan, Jin Menghan, Ying Jia, Yang Liu, Yang Shenmin,
Gu Chongjuan, Zhong Yunong, Huo Ran, Ge Long, Meng Qingxia

Pregnancy outcomes of abnormal fertilized embryos: a systematic review and meta-analysis 58

Li Xinyan, Li Fuyun, Chai Sanming, Wang Li, Sang Yuankun, Wang Yan,
Xie Guangmei

New Technique

Application of chromosome conformation karyotyping in the field of reproduction 66

Bao Xiao, Sun Yingpu

Reviews

Research progress of assisted reproductive technology protocols in patients with diminished ovarian reserve	71
<i>Fu Yuke, Wang Hejie, Yu Guiting, Cai Jie, Zhang Weifeng</i>	
Research progress on fertility protection in adenomyosis with traditional Chinese medicine	77
<i>Li Danyun, Zhou Jieyun, Sun Xiaochun, Zhong Ruihua, Zhuang Mengfei, Huang Shenghui, Zhang Tingting, Cao Yang</i>	
Research progress on the immune mechanism of traditional Chinese medicine in treating polycystic ovary syndrome based on macrophage polarization	83
<i>Zhen Xina, Yu Yi, Xiang Shan, Lian Fang</i>	
Advances in the role of gonadotropin-releasing hormone neurons in the pathophysiological mechanisms of polycystic ovary syndrome	89
<i>He Xueqin, Lou Yanru, Li Jialin, Yang Rui</i>	
Research advances in the mechanisms of integrin proteins regulating embryo implantation	94
<i>Gao Lili, Liu Jiabin, Miao Miao, Wang Ping, Wang Yan, Xin Xiaofeng, Zhang Qingjun, Cao Jiang, Wu Chunlei</i>	

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我国生殖健康领域“十四五”进展及“十五五”展望

乔杰

北京大学第三医院妇产科生殖医学中心, 北京 100191

Email: jie.qiao@263.net

【摘要】 妇幼健康是全民健康的重要基石和人口安全及社会发展的驱动力, 生殖健康更是守护生命健康的起点。刚刚过去的“十四五”时期, 是我国全面建设社会主义现代化国家新征程的开局起步期, 也是推动卫生健康事业高质量发展的关键五年。在国家“健康优先”和“人口高质量发展”战略的指引下, 我国生殖健康事业不断强化落实“促优生、强保障、全周期”要点。本文旨在简要梳理“十四五”期间我国生殖健康事业在政策体系、科技创新与公共卫生方面取得的代表性进展, 并基于国家最新战略部署, 对“十五五”时期的核心任务与发展方向进行展望。

【关键词】 生殖健康; 健康优先; 人口高质量发展; 进展与展望

Progress in China's reproductive health sector during the 14th Five-Year Plan period and prospects for the 15th Five-Year Plan period

Qiao Jie

Center of Reproductive Medicine, Department of Obstetrics and Gynecology, Peking University Third Hospital, Beijing 100191, China

Email: jie.qiao@263.net

【Abstract】 Maternal and child health serves as a crucial cornerstone of public health, as well as a driving force for population security and social development, with reproductive health being the very starting point for safeguarding life and well-being. The recently concluded 14th Five-Year Plan period has witnessed the initial phase of China's new journey toward fully building a modern socialist country, and these five years also constituted a pivotal window for transitioning from volume expansion to quality enhancement. Guided by the national strategies of 'Health first' and 'High-quality population development', China's reproductive health initiatives have continuously strengthened their focus on 'Promoting healthy births, Enhancing safeguards, and Ensuring full-cycle care'. This article aims to briefly outline representative progresses made in China's reproductive health sector during the 14th Five-Year Plan period regarding the

policy system, technological innovation, and public health. Furthermore, based on the latest national strategic plans, it will provide an outlook on the core tasks and development directions for the upcoming 15th Five-Year Plan period.

【Key words】 Reproductive health; Health first; High-quality population development; Progress and prospects

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个体化胚胎移植临床实践指南 (2026版)

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通信作者:李蓉,北京大学第三医院妇产科生殖医学中心,北京 100191, Email: roseli001@sina.com; 刘见桥, 广州医科大学附属第三医院妇产科生殖医学中心, 广州 510150, Email: lj88gz@163.com; 靳镭, 华中科技大学同济医学院附属同济医院生殖医学中心, 武汉 430030, Email: ljin@tjh.tjmu.edu.cn

【摘要】 随着辅助生殖技术的快速发展, 胚胎移植策略的优化与个体化选择已成为提高临床妊娠率、保障母婴安全的关键环节。基于当前最佳循证医学证据, 本标准指南针对个体化胚胎移植临床实践中的关键问题, 按照循证临床实践指南制订的方法, 采用推荐意见分级的评估、制定及评价方法, 结合多学科专家临床经验并充分考虑我国患者的临床特征与需求, 形成了涵盖六大核心主题、45条推荐意见和3条专家建议的临床指导方案。本指南使用人群为生殖医学医师、胚胎学家及妇产科专业人员; 目标获益人群为计划或正在接受辅助生殖治疗的不孕症夫妇, 尤其适用于需个体化移植策略的特殊病例。

【关键词】 生殖技术, 辅助; 标准指南; 循证

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Clinical practice guideline on individualized embryo transfer (2026)

Reproductive Medicine Professional Committee of Chinese Medical Doctor Association,
Expert Group for the Development of the Clinical Practice Guideline on Individualized
Embryo Transfer

Corresponding authors: Li Rong, Center for Reproductive Medicine, Department of Obstetrics and Gynecology, Peking University Third Hospital, Beijing 100191, China, Email: roseli001@sina.com; Liu Jianqiao, Center for Reproductive Medicine, Department of Obstetrics and Gynecology, the Third Affiliated Hospital of Guangzhou Medical University, Guangzhou 510150, China, Email: lj88gz@163.com; Jin Lei, Reproductive Medicine Center, Tongji Hospital, Tongji Medical College, Huazhong University of Science and Technology, Wuhan 430030, China, Email: ljin@tjh.tjmu.edu.cn

【 Abstract 】 With the rapid development of assisted reproductive technology, the optimization and individualized selection of embryo transfer strategies have become critical for improving clinical pregnancy rates and ensuring maternal and neonatal safety. Based on the current best available evidence, this standard guideline addressed key issues in individualized embryo transfer clinical practice. We adopted the methods in developing evidence-based clinical practice guidelines and used the grading of recommendations assessment, development and evaluation methods. We incorporated multidisciplinary expert clinical experience while fully considering the clinical characteristics and needs of Chinese patients, and finally formed 45 pieces of recommendation and 3 consensus recommendations in 6 themes. The standard guideline is intended for use by reproductive physicians, embryologists, obstetricians, and gynecologists. The target population is couples planning or undergoing assisted reproductive treatment, particularly those requiring individualized transfer strategies for special clinical cases.

【 Key words 】 Reproductive technology, assisted; Standard guideline; Evidence-based

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嵌合型特纳综合征患者辅助生殖助孕结局分析

胡曼玉 杨宸 郑威 闫一璇 俎若雯 杨悦 张俊韦 任炳楠 管一春

郑州大学第三附属医院生殖健康医院, 郑州 450052

通信作者: 管一春, Email: lisamayguan@126.com

【摘要】 目的 比较嵌合型特纳综合征 (Turner syndrome, TS) 不孕患者与染色体核型正常不孕患者接受体外受精/卵胞质内单精子注射 (*in vitro* fertilization/intracytoplasmic sperm injection, IVF/ICSI) 助孕结局。方法 采用回顾性队列研究, 分析 2015 年 11 月至 2023 年 6 月于郑州大学第三附属医院生殖健康医院因输卵管因素或男方因素接受 IVF/ICSI 助孕的患者临床资料, 研究组为嵌合型 TS 患者 ($n=36$), 对照组为染色体核型正常不孕患者 ($n=2\ 713$), 采用倾向性评分匹配 (propensity score matching, PSM) 方法, 依照女方年龄、窦卵泡计数、抗米勒管激素、体质量指数, 将两组患者进行 1 : 4 匹配, 比较两组患者的基线特征、促排卵指标、胚胎实验室结局 (优质胚胎率、可利用胚胎率、囊胚形成率等)、新鲜周期临床结局 (临床妊娠率、活产率、流产率)、累积临床结局 (累积妊娠率、累积活产率)。结果 PSM 后, 研究组纳入 33 例患者, 对照组纳入 132 例患者。研究组促性腺激素使用时间 [(11.55 ± 2.96) d] 显著低于对照组 [(12.82 ± 2.60) d, $P=0.016$], 两组其余胚胎实验室结局、新鲜周期临床结局 (临床妊娠率、活产率、流产率)、累积临床结局 (累积妊娠率、累积活产率) 差异均无统计学意义 (均 $P>0.05$)。结论 嵌合型 TS 患者经 IVF/ICSI 助孕可获得与染色体核型正常不孕患者相当的胚胎实验室结局、新鲜周期临床结局 (临床妊娠率、活产率、流产率)、累积临床结局 (累积妊娠率、累积活产率)。

【关键词】 体外受精; 精子注射, 细胞质内; 嵌合型特纳综合征; 染色体核型; 辅助生殖结局

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Analysis of assisted reproductive outcomes in patients with mosaic Turner syndrome

Hu Manyu, Yang Chen, Zheng Wei, Yan Yixuan, Zu Ruowen, Yang Yue, Zhang Junwei, Ren Bingnan, Guan Yichun

Reproductive Health Hospital, the Third Affiliated Hospital of Zhengzhou University, Zhengzhou 450052, China

Corresponding author: Guan Yichun, Email: lisamayguan@126.com

【Abstract】 Objective To compare *in vitro* fertilization/intracytoplasmic sperm injection (IVF/ICSI) outcomes between infertile patients with mosaic Turner syndrome (TS) and infertile patients with normal chromosomal karyotypes. **Methods** A retrospective cohort study was conducted on the clinical data of all patients who underwent IVF/ICSI treatment due to tubal factors or male factors in the Reproductive Health Hospital, the Third Affiliated Hospital of Zhengzhou University from November 2015 to June 2023. The study group consisted of patients with mosaic TS ($n=36$), and the control included infertile patients with normal chromosomal karyotypes ($n=2\ 713$). The propensity score matching (PSM) method was used to match the two groups at a ratio of 1 : 4 based on female age,

antral follicle count, anti-Müllerian hormone, and body mass index. The baseline characteristics, ovulation induction indicators embryonic laboratory outcomes (such as high-quality embryo rate, available embryo rate, and blastocyst formation rate), and fresh clinical outcomes (clinical pregnancy rate, live birth rate, miscarriage rate), and cumulative clinical outcomes (cumulative pregnancy rate and cumulative live birth rate) were compared between the two groups. **Results** After PSM, 33 patients were included in the study group and 132 in the control. Duration of gonadotropin used in the study group was significantly shorter than that in the control [(11.55±2.96) d vs. (12.82±2.60) d, $P=0.016$]. There were no statistically significant differences in other embryonic laboratory outcomes, fresh clinical outcomes (clinical pregnancy rate, live birth rate, miscarriage rate), or cumulative clinical outcomes (cumulative pregnancy rate and cumulative live birth rate) between the two groups (all $P>0.05$). **Conclusion** Mosaic TS patients undergoing IVF/ICSI-assisted reproduction can achieve embryological laboratory outcomes, fresh-cycle clinical outcomes (clinical pregnancy rate, live birth rate, miscarriage rate), and cumulative clinical outcomes (cumulative pregnancy rate and cumulative live birth rate) comparable to those of infertile patients with normal chromosomal karyotypes.

【 Key words 】 Fertilization *in vitro*; Sperm injection, intracytoplasmic; Mosaic Turner syndrome; Chromosomal karyotype; Assisted reproductive outcomes

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临床研究

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系统性免疫炎症指数及系统性炎症反应指数对辅助生殖结局的影响及预测价值

桑晨¹ 曾湘辉² 贾佳¹ 陈浩¹ 王芳²

¹兰州大学公共卫生学院, 兰州 730000; ²兰州大学第二医院生殖医学科, 兰州 730000

通信作者: 王芳, Email: ery_fwang@lzu.edu.cn

【摘要】 目的 探讨系统性免疫炎症指数 (systemic immune-inflammation index, SII) 及系统性炎症反应指数 (systemic immune-response index, SIRI) 与辅助生殖结局的关系及预测价值。方法 采用回顾性队列研究分析, 收集 2017 年 1 月到 2021 年 12 月在兰州大学第二医院生殖医学科首次就诊并接受体外受精 (*in vitro* fertilization, IVF)/卵胞质内单精子注射 (intracytoplasmic sperm injection, ICSI) 治疗的 335 例患者资料, 分别根据 SII 和 SIRI 的分布情况按三分位数将其分为三组, 记为 T1、T2 和 T3。采用多因素 logistic 回归模型评估 SII-SIRI、Ln (SII) 和 Ln (SIRI) 与妊娠结局之间的关联。采用限制性立方样条函数分析其剂量-反应关系。运用受试者工作特征曲线下面积 (area under the curve, AUC) 评估 Ln (SII)、Ln (SIRI) 的预测效能, 并对年龄、体质量指数等进行分层分析。结果 Ln (SII)、Ln (SIRI) 均与活产发生风险呈负相关, 比值比分别为 0.40 (95% CI: 0.24~0.67, $P<0.001$) 和 0.42 (95% CI: 0.26~0.67, $P<0.001$)。剂量反应关系显示, Ln (SII) 和 Ln (SIRI) 水平与活产发生风险均呈线性负相关 ($P_{\text{overall}}=0.001$, $P_{\text{overall}}=0.002$); 而 Ln (SII) 与胚胎停育发生风险呈线性正相关 ($P_{\text{overall}}=0.029$)。在预测能力方面, Ln (SII) 在生化妊娠 (AUC=0.679) 和胚胎停育 (AUC=0.726) 中的判别能力优于 Ln (SIRI) (AUC=0.667, AUC=0.698)。Ln (SIRI) 在活产中的判别能力 (AUC=0.698) 优于 Ln (SII) (AUC=0.679)。分层分析显示, 与卵巢功能正常者相比, 在卵巢功能减退人群中, Ln (SII) 每增加 1 个标准差, 活产风险显著降低约 89% ($OR=0.11$, 95% CI: 0.01~0.71), 而胚胎停育风险增加 4.95 倍 ($OR=4.95$, 95% CI: 1.58~7.72)。结论 对于行 IVF/ICSI 助孕患者, SII 和 SIRI 升高与活产率下降有关, SII 升高与胚胎停育发生风险升高有关。SII 和 SIRI 对助孕结局具有不同的预测价值。

【关键词】 妊娠结局; 辅助生殖; 系统性免疫炎症指数; 系统性炎症反应指数

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Impact and predictive value of the systemic immune-inflammation index and the systemic inflammation response index on assisted reproductive outcomes

Sang Chen¹, Zeng Xianghui², Jia Jia¹, Chen Hao¹, Wang Fang²

¹School of Public Health, Lanzhou University, Lanzhou 730000, China; ²Reproductive Medicine Center, the Second Hospital of Lanzhou University, Lanzhou 730000, China

Corresponding author: Wang Fang, Email: ery_fwang@lzu.edu.cn

【 Abstract 】 Objective To investigate the association of the systemic immune-inflammation index (SII) and the systemic inflammation response index (SIRI) with assisted reproductive outcomes and its predictive value. **Methods** This retrospective cohort study included 335 patients who first visited the Reproductive Medicine Center of the Second Hospital of Lanzhou University and underwent *in vitro* fertilization (IVF) or intracytoplasmic sperm injection (ICSI)

treatment with subsequent embryo transfer between January 2017 and December 2021. These patients were divided into three groups (T1, T2, T3) based on the tertiles of SII and SIRI, respectively. Multivariable logistic regression models were used to evaluate the associations of SII-SIRI patterns, Ln(SII), and Ln(SIRI) with pregnancy outcomes. Restricted cubic spline analyses were performed to examine dose-response relationships. The predictive performance of Ln(SII) and Ln(SIRI) was assessed using receiver operating characteristic curves and the area under the curve (AUC). Stratified analysis were further conducted for age, body mass index, and other covariates. **Results** Both Ln(SII) and Ln(SIRI) were negatively associated with the likelihood of live birth, with odds ratios (ORs) of 0.40 (95% CI: 0.24–0.67, $P<0.001$) and 0.42 (95% CI: 0.26–0.67 $P<0.001$), respectively. The dose-response analysis showed that the levels of Ln(SII) and Ln(SIRI) were linearly and inversely associated with the risk of live birth ($P_{\text{overall}}=0.001$ and 0.002, respectively), whereas Ln(SII) was linearly and positively associated with the risk of embryonic arrest ($P_{\text{overall}}=0.029$). Regarding predictive ability, Ln(SII) had a higher predictive value for biochemical pregnancy (AUC=0.679) and embryonic arrest (AUC=0.726) compared with Ln(SIRI) (AUC=0.667, AUC=0.698, respectively). In contrast, Ln(SIRI) (AUC=0.698) outperformed Ln(SII) (AUC=0.679) in predicting live birth. Stratified analysis revealed that, among women with diminished ovarian reserve, each 1-SD increment in Ln(SII) was associated with an 89% reduction in the odds of live birth (OR=0.11, 95% CI: 0.01–0.71) and a 4.95-fold increase in the odds of embryonic arrest (OR=4.95, 95% CI: 1.58–7.72) compared with those with normal ovarian function. **Conclusion** For patients undergoing IVF/ICSI, elevated SII and SIRI are associated with decreased live birth rates, while elevated SII is associated with an increased risk of embryonic arrest. SII and SIRI have different predictive values for assisted reproductive outcomes.

【 Key words 】 Pregnancy outcome; Assisted reproduction; Systemic immune inflammation index; Systemic inflammatory response index

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·实验研究·

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DHEA 诱导的 PCOS 小鼠模型脑部免疫状态的改变及其潜在的慢性炎症机制

罗靖之¹ 吴璟淳² 衡黛¹ 张一丹³ 黄伯昀¹ 李娜¹ 周玖月¹ 梁朝远² 杭婧³ 王艳² 张浩琳¹

¹北京大学第三医院中医科 女性生育力促进全国重点实验室, 北京 100086; ²北京大学第三医院基础医学研究中心, 北京 100086; ³北京大学第三医院妇产科生殖医学中心 辅助生殖教育部重点实验室(北京大学) 生殖内分泌与辅助生殖技术北京市重点实验室, 北京 100086

吴璟淳和罗靖之对本文有同等贡献

通信作者: 张浩琳, Email: zoe@bjmu.edu.cn

【摘要】 目的 探究多囊卵巢综合征 (polycystic ovary syndrome, PCOS) 的特征性中枢免疫状态改变及其潜在的慢性炎症机制。方法 将青春前期 SPF 级雌性 C57BL/6 小鼠随机分为两组, 应用脱氢表雄酮 (dehydroepiandrosterone, DHEA) 诱导建立 PCOS 小鼠模型, 记为 DHEA 组 ($n=20$), 对照组小鼠应用空白溶剂 ($n=20$)。监测小鼠体重、动情周期、血清雄激素及空腹胰岛素变化。建模成功后利用流式细胞术检测 DHEA 组和对照组小鼠的脑部免疫细胞比例, 免疫组织化学检测小鼠脑部巨噬细胞数量变化, 流式细胞微珠阵列和酶联免疫吸附试验检测外周血清细胞因子水平。结果 DHEA 组小鼠雄激素水平 [$(5.16 \pm 0.46) \mu\text{g/L}$] 明显高于对照组 [$(0.05 \pm 0.01) \mu\text{g/L}$, $P<0.001$], 且动情周期紊乱。DHEA 处理后 18 d, DHEA 组体重 [$(19.39 \pm 1.14) \text{g}$] 显著高于对照组 [$(18.09 \pm 0.53) \text{g}$, $P<0.001$], 最后一次注射 DHEA 10 h 后, DHEA 组空腹胰岛素水平 [$(13.05 \pm 0.73) \mu\text{U/mL}$] 显著高于对照组 [$(11.16 \pm 1.05) \mu\text{U/mL}$, $P<0.001$], 说明 DHEA 诱导的 PCOS 小鼠建模成功。在中枢免疫的检测方面, DHEA 组 CD45 阳性的免疫细胞占比 4.49%, 对照组占比 2.80%; DHEA 组大脑皮层区巨噬细胞数目 [(7.53 ± 2.85)] 显著高于对照组 [(5.00 ± 2.29) , $P=0.034$], 海马区巨噬细胞数目 [(4.47 ± 2.71)] 与对照组 [(5.00 ± 2.60)] 相比差异无统计学意义 ($P=0.839$); 与对照组相比, DHEA 组白细胞介素-23、粒细胞集落刺激因子和 C-C 模体趋化因子配体 (C-C motif chemokine ligand, CCL) 5 水平均显著降低 ($P=0.049$ 、 $P=0.003$ 、 $P=0.012$), CCL2 水平显著升高 ($P=0.038$)。结论 DHEA 诱导的 PCOS 小鼠呈现脑部免疫细胞浸润增加及巨噬细胞区域性聚集的中枢免疫激活特征, 伴随促炎/抗炎细胞因子失衡的外周免疫调节异常特征, PCOS 小鼠处于神经免疫调节异常和慢性低度炎症状态。

【关键词】 多囊卵巢综合征; 巨噬细胞; 白细胞介素-23; 粒细胞集落刺激因子

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DHEA-induced alteration of central immune status in a mouse model of PCOS and its underlying chronic inflammatory mechanisms

Luo Jingzhi¹, Wu Jingchun², Heng Dai¹, Zhang Yidan³, Huang Boyun¹, Li Na¹, Zhou Jiuyue¹, Liang Zhaoyuan², Hang Jing³, Wang Yan², Zhang Haolin¹

¹ Department of Traditional Chinese Medicine, Peking University Third Hospital; State Key Laboratory of Female Fertility Promotion, Beijing 100086, China; ² Institute of Medical Innovation and Research, Peking University Third Hospital, Beijing 100086, China; ³ Center for Reproductive Medicine, Department of Obstetrics and Gynecology, Peking University Third Hospital; Key Laboratory of Assisted Reproduction (Peking University), Ministry of Education; Beijing Key Laboratory of Reproductive Endocrinology and Assisted Reproductive Technology, Beijing 100086, China

Wu Jingchun and Luo Jingzhi contributed equally to the article

Corresponding author: Zhang Haolin, Email: zoe@bjmu.edu.cn

【Abstract】 Objective To investigate the characteristic alterations in central immune status and the underlying chronic inflammatory mechanisms in polycystic ovary syndrome (PCOS). **Methods** Prepubertal SPF female C57BL/6 mice were randomly allocated into dehydroepiandrosterone (DHEA) group ($n=20$) and control group ($n=20$). The DHEA group was treated with DHEA to induce the PCOS model, the control group were administered a blank solvent, and the mice were monitored for changes in body weight, estrous cycle, serum androgen and fasting insulin levels after a period of time. Upon successful model induction, the proportion of immune cells was detected by flow cytometry, the number of macrophages in the mouse brain was detected by immunohistochemistry, and the levels of various cytokines in serum were detected by flow cytometric bead array and enzyme-linked immunosorbent assay. **Results** Mice in DHEA group had significantly higher androgen levels [(5.16 ± 0.46) $\mu\text{g/L}$] than that in control group [(0.05 ± 0.01) $\mu\text{g/L}$, $P<0.001$], as well as disorganized estrous cycle. The body weight of the DHEA group after 18 days of DHEA treatment [(19.39 ± 1.14) g] was significantly higher than that of the control [(18.09 ± 0.53) g, $P<0.001$]. Ten hours after the last DHEA injection, the fasting insulin level of the DHEA group [(13.05 ± 0.73) $\mu\text{U/mL}$] was significantly higher than that of the control [(11.16 ± 1.05) $\mu\text{U/mL}$, $P<0.001$], which indicating that DHEA-induced modeling of PCOS mice was successful. The percentage of CD45-labeled immune cells was 4.49% in DHEA group and 2.80% in control group; the number of macrophages in the cortical area of DHEA group (7.53 ± 2.85) was significantly higher than that in control group (5.00 ± 2.29 , $P=0.034$), and the number of macrophages in the hippocampus area in DHEA group (4.47 ± 2.71) did not show any statistically significant difference from that of control group (5.00 ± 2.60 , $P=0.839$); the levels of interleukin-23, granulocyte colony-stimulating factor and C-C motif chemokine ligand (CCL) 5 in DHEA group were significantly reduced compared with control group ($P=0.049$, $P=0.003$, $P=0.012$), and the level of CCL2 was significantly increased compared with control group ($P=0.038$). **Conclusion** The DHEA-induced PCOS mouse model exhibits central immune activation characterized by increased brain immune cell infiltration and regional macrophage

aggregation, accompanied by peripheral immune dysregulation featuring pro-/anti-inflammatory cytokine imbalance. These findings suggest that PCOS mice exist in a state of neuroimmune dysregulation and chronic low-grade inflammation.

【Key words】 Polycystic ovary syndrome; Macrophages; Interleukin-23; Granulocyte colony-stimulating factor

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2014—2024 年中国生殖医学临床实践指南和专家共识的系统评价

孙小燕¹ 金梦寒¹ 赢佳¹ 杨柳² 杨慎敏¹ 顾崇娟³ 钟禹农¹ 霍然⁴ 葛龙⁵ 孟庆霞¹

¹南京医科大学附属苏州医院 苏州市立医院生殖与遗传中心, 苏州 215002; ²浙江大学医学院附属妇产科医院妇产科, 杭州 310006; ³广州市妇女儿童医疗中心妇科, 广州 510623; ⁴南京医科大学生殖医学与子代健康全国重点实验室, 南京 211166; ⁵兰州大学公共卫生学院, 兰州 730000

通信作者: 孟庆霞, Email: mqx593204@163.com

【摘要】目的 系统评价 2014 年至 2024 年中国生殖医学领域临床实践指南和专家共识的发布情况及方法学质量。**方法** 检索 PubMed、CNKI、万方数据和中华医学期刊网, 纳入 2014 年 1 月 1 日至 2024 年 12 月 31 日以中国专家为主体发布的生殖医学临床实践指南和专家共识并进行描述性分析, 使用临床指南研究与评估工具 II (Appraisal of Guidelines for Research and Evaluation II, AGREE II) 评价纳入的循证临床实践指南的方法学质量。**结果** 共纳入 245 部生殖医学临床实践指南和专家共识, 包括 197 部专家共识和 48 部临床实践指南 (其中 27 部为循证指南); 其中, 西医指南和共识 215 部, 中医指南和共识 30 部。近 4 年, 生殖医

学指南和共识的数量显著增加。以女性因素制订的指南和共识占比最高,为 49.39% (121/245); 中医领域循证指南占比高,为 56.67% (17/30)。然而,缺乏初级保健和患者版本的指南和共识。对 27 部循证指南的质量评估结果显示, AGREE II 六个领域包括范围与目的、参与人员、严谨性、清晰性、应用性和独立性的平均得分分别为 81.38%、57.92%、64.62%、73.66%、46.00%和 72.53%。结论 中国生殖医学临床实践指南和专家共识实用性强,但指南制订方法学质量存在差异,在指南应用性、利益相关者参与度和严谨性方面更需关注。未来的指南制订者应参考国内和国际指南制订标准以制订高质量指南并促进其应用。

【关键词】 生殖医学; 共识; 指南; AGREE II; 中国

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Chinese clinical practice guidelines and expert consensus in reproductive medicine from 2014 to 2024: a systematic review

Sun Xiaoyan¹, Jin Menghan¹, Ying Jia¹, Yang Liu², Yang Shenmin¹, Gu Chongjuan³,
Zhong Yunong¹, Huo Ran⁴, Ge Long⁵, Meng Qingxia¹

¹ Center of Reproduction and Genetics, Suzhou Municipal Hospital; the Affiliated Suzhou Hospital of Nanjing Medical University, Suzhou 215002, China; ² Department of Gynecology and Obstetrics, Women's Hospital, School of Medicine, Zhejiang University, Hangzhou 310006, China; ³ Department of Gynecology, Guangzhou Women and Children's Medical Center, Guangzhou 510623, China; ⁴ State Key Laboratory of Reproductive Medicine and Offspring Health, Nanjing Medical University, Nanjing 211166, China; ⁵ School of Public Health, Lanzhou University, Lanzhou 730000, China

Corresponding author: Meng Qingxia, Email: mxq593204@163.com

【Abstract】 Objective To systematically evaluate the current landscape and methodological quality of Chinese clinical practice guidelines (CPGs) and expert consensus in the reproductive medicine field from 2014 to 2024. **Methods** PubMed, CNKI, Wanfang Data, and the Chinese Medical Journal Network were searched to identify CPGs and expert consensus in reproductive medicine published between 1 January 2014 and 31 December 2024, with Chinese experts as the leading contributors. Descriptive analysis were conducted, and the methodological quality of evidence-based CPGs was assessed by using the Appraisal of Guidelines for Research and Evaluation II (AGREE II) instrument. **Results** A total of 245 full-text articles were assessed for eligibility, including 197 expert consensus, 48 CPGs (27 evidence-based CPGs); Western-medicine documents accounted for 215 and traditional Chinese medicine (TCM) accounted for 30. The number of guidelines/consensus rose markedly in the last four years. Documents focused on female factors represented the largest proportion at 49.39% (121/245), and TCM field had a high proportion of evidence-based guidelines, accounting for 56.67% (17/30). However, there was a lack of guidelines for primary care and patient versions. The quality assessment of the 27 evidence-based guidelines showed mean scores of 81.38%, 57.92%, 64.62%,

73.66%, 46.00%, and 72.53% for the six AGREE II domains including scope and purpose, stakeholder involvement, rigor of development, clarity of presentation, applicability, and editorial independence, respectively. **Conclusion** Chinese reproductive medicine CPGs and expert consensus are highly practical, yet their methodological quality is heterogeneous. Particular attention should be paid to applicability, stakeholder involvement, and rigor of development. Future developers should adhere to national and international standards to produce high-quality guidelines and facilitate their implementation.

【Key words】 Reproductive medicine; Consensus; Guideline; AGREE II; China

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异常受精胚胎妊娠结局的系统评价与 meta 分析

李昕妍 李甫云 柴三明 王丽 桑元坤 王琰 谢广妹
甘肃省妇幼保健院 甘肃省中心医院生殖医学中心, 兰州 730070
通信作者: 谢广妹, Email: xgm721201@163.com

【摘要】 **目的** 探讨异常受精胚胎妊娠结局, 为临床胚胎选择提供参考。**方法** 制定检索策略并在 PubMed、Embase、Cochrane Library、中国知网、万方和中国生物医学文献数据库中检索从建库至 2025 年 1 月关于异常受精与正常受精胚胎妊娠结局的回顾性队列研究, 由 2 名研究者独立筛选文献、提取资料并评价纳入研究的偏倚风险, 最终纳入 16 篇相关研究, 采用 RevMan5.4 软件分析异常受精与正常受精胚胎临床结局的差异。**结果** 临床妊娠率 ($OR=0.75$, 95% CI : 0.62~0.91, $P=0.004$)、活产率 ($OR=0.62$, 95% CI : 0.50~0.77, $P<0.001$) 异常受精组均低于正常受精组; 流产率 ($OR=1.22$, 95% CI : 1.03~1.44, $P=0.020$) 异常受精组高于正常受精组; 种植率 ($OR=0.83$, 95% CI : 0.64~1.08, $P=0.160$)、新生儿畸形率 ($OR=1.40$, 95% CI : 0.50~3.92, $P=0.520$) 异常受精组与正常受精组差异均无统计学意义。**结论** 正常受精胚胎应作为移植的首选。当无可用双原核胚胎

时,若发育质量较好的零原核或单原核胚胎成为唯一可选方案,则可在充分告知患者相关风险,并获取患者知情同意后,考虑将其用于移植。

【关键词】 生殖技术, 辅助; 受精; 零原核; 单原核; 系统评价; Meta 分析

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Pregnancy outcomes of abnormal fertilized embryos: a systematic review and meta-analysis

*Li Xinyan, Li Fuyun, Chai Sanming, Wang Li, Sang Yuankun, Wang Yan, Xie Guangmei
Reproductive Medicine Center, Gansu Provincial Maternal and Child Health Hospital
(Gansu Provincial Central Hospital), Lanzhou 730070, China*

Corresponding author: Xie Guangmei, Email: xgm721201@163.com

【Abstract】 Objective To evaluate the pregnancy outcomes associated with abnormal fertilized embryos, thereby providing a reference for optimizing clinical embryo selection. **Methods** A search strategy was formulated, and retrospective cohort studies on pregnancy outcomes of abnormal fertilization and normal fertilization embryos were retrieved from the database inception to January 2025 in PubMed, Embase, Cochrane Library, CNKI, Wanfang Data and CBM databases. Two reviewers independently screened literature, extracted data, and assessed risk of bias of included studies. Finally, 16 related studies were included. The clinical outcomes of embryos with abnormal fertilization were compared with those of normal fertilization using RevMan5.4 software. **Results** The clinical pregnancy rate ($OR=0.75$, 95% CI : 0.62–0.91, $P=0.004$) and the live birth rate ($OR=0.62$, 95% CI : 0.50–0.77, $P<0.001$) in the abnormal fertilization group were lower than those in the normal fertilization group; the miscarriage rate ($OR=1.22$, 95% CI : 1.03–1.44, $P=0.020$) in the abnormal fertilization group was higher than that in the normal fertilization group. There was no statistical difference in the the implantation rate ($OR=0.83$, 95% CI : 0.64–1.08, $P=0.160$) and the fetal malformation rate ($OR=1.40$, 95% CI : 0.50–3.92, $P=0.520$). **Conclusion** Embryos from normal fertilization should be prioritized for transfer. When no other viable options exist, well-developed monopronuclear or nonpronuclear embryos can be used as a sole option, but only following detailed risk disclosure and the procurement of informed consent.

【 Key words 】 Reproductive techniques, assisted; Fertilization; Nonpronuclear; Monopronuclear; Systematic review; Meta analysis

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染色体构象核型分析技术在生殖领域的应用

鲍晓 孙莹璞

郑州大学第一附属医院生殖医学中心 河南省生殖与遗传重点实验室,
郑州 450052

通信作者: 孙莹璞, Email: syp2008@vip.sina.com

【摘要】 目前, 用于检测染色体异常的不同技术各有其优势和局限性, 为明确诊断常需联合多种细胞遗传学和分子检测方法。染色体构象核型分析(chromosome conformation karyotyping, C-MoKa) 技术通过三维基因组构象捕获和高通量测序技术, 可同时检测染色体拷贝数变异及结构变异, 拥有良好的检测性能, 在生殖领域将具有广泛应用前景。本文介绍了临床染色体异常主要检测技术, 新技术 C-MoKa 原理、优势、局限性和未来应用前景。

【关键词】 染色体结构变异; 染色体构象核型分析技术; 染色体核型; 临床应用

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Application of chromosome conformation karyotyping in the field of reproduction

Bao Xiao, Sun Yingpu

Center for Reproductive Medicine, the First Affiliated Hospital of Zhengzhou University;
Henan Key Laboratory of Reproduction and Genetics, Zhengzhou 450052, China

Corresponding author: Sun Yingpu, Email: syp2008@vip.sina.com

【 Abstract 】 Currently, various detection techniques for chromosomal abnormalities have their own advantages and limitations. To clarify the diagnosis, it is often necessary to combine multiple cytogenetic and molecular detection methods. The new molecular karyotyping technology chromosome conformation karyotyping (C-MoKa) combines three-dimensional genome conformation capture and high-throughput sequencing technology, enabling one-time detection of both copy number variations and structural variations in chromosomes. It demonstrates good detection performance and holds broad application prospects in the field of reproduction. This article introduces the main detection techniques for clinical chromosomal abnormalities, compares and explains the principles, advantages, limitations, and future application prospects of the new technology C-MoKa.

【 Key words 】 Genomic structural variation; Chromosome conformation karyotyping; Chromosome karyotype; Clinical application

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综述

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卵巢储备功能减退患者辅助生殖助孕方案研究进展

符雨珂¹ 汪荷洁¹ 于桂婷¹ 蔡婕² 张伟峰³

¹ 宁波大学医学院, 宁波 315211; ² 宁波大学附属妇女儿童医院生殖医学中心, 宁波 315211; ³ 宁波大学附属妇女儿童医院妇科, 宁波 315211

通信作者: 蔡婕, Email: 32113681@qq.com

【摘要】 卵巢储备功能减退 (diminished ovarian reserve, DOR) 是一种卵巢功能障碍的临床综合征, 包括卵母细胞数量的减少和质量的下降。DOR 患者生育力下降, 即使行辅助生殖技术 (assisted reproductive technology, ART) 助孕, 仍易出现卵巢反应性降低、胚胎质量差、流产等不良结局。多项研究表明, 为 DOR 患者制定个体化促排卵方案, 有助于改善其 ART 助孕预后。本文综述了目前 DOR 患者常用的促排卵方案和相关辅助药物, 以期为其 ART 助孕过程中促排卵方案及辅助治疗的选择提供参考。

【关键词】 生殖技术, 辅助; 控制性卵巢刺激; 卵巢储备功能减退

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Research progress of assisted reproductive technology protocols in patients with diminished ovarian reserve

Fu Yuke¹, Wang Hejie¹, Yu Guiting¹, Cai Jie², Zhang Weifeng³

¹ School of Medicine, Ningbo University, Ningbo 315211, China; ² Reproductive Medicine Center, the Affiliated Women and Children's Hospital of Ningbo University, Ningbo 315211, China; ³ Department of Gynecology, the Affiliated Women and Children's Hospital of Ningbo University, Ningbo 315211, China

Corresponding author: Cai Jie, Email: 32113681@qq.com

【Abstract】 Diminished ovarian reserve (DOR) is a clinical syndrome characterized by ovarian dysfunction, which encompasses a reduction in both the quantity and quality of oocytes. Patients with DOR experience compromised

fertility, even with assisted reproductive technology (ART), they remain at high risk for poor ovarian response, impaired embryo quality, and increased miscarriage rates. Numerous studies have demonstrated that the implementation of individualized ovulation induction protocols for patients with DOR can enhance ART prognosis. This article aims to review commonly utilized ovarian stimulation protocols and associated adjuvant medications for DOR patients, thereby providing guidance on the selection of appropriate ovarian stimulation strategies and adjunctive therapies during the ART process.

【 Key words 】 Reproductive technology, assisted; Controlled ovarian stimulation; Diminished ovarian reserve

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综述

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子宫腺肌病生育力保护的中医药研究进展

李丹云¹ 周洁芸² 孙小淳¹ 钟瑞华² 庄梦斐¹ 黄圣惠¹ 张婷婷¹
曹阳¹

¹上海中医药大学附属岳阳中西医结合医院妇科, 上海 200437; ²上海市生物医药技术研究院药物器械研究所生殖药理组, 上海 200032

通信作者: 曹阳, Email: cindy8813966@126.com

【摘要】 子宫腺肌病是育龄女性生育力下降的重要病因之一, 其病理机制涉及解剖结构异常和子宫局部微环境失衡, 导致胚胎着床障碍与不良妊娠结局。本文系统综述了中医药在子宫腺肌病生育力保护中的理论与实践进展。基于“肾虚-血瘀-冲任损伤”的核心病机, 中医以“补肾活血、消补兼施”为治则, 结合月经周期动态调整治法, 融合药物内服、外治法与情志调摄等综合干预。临床证据表明, 通过三级管理策略, 中医药可全程参与子宫腺肌病患者的生育力保护, 有效改善病灶纤维化, 协同辅助生殖技术提高妊娠率, 改善子宫内膜容受性和卵巢储备功能, 降低术后复发风险。本文旨在为中医药在子宫腺肌病生育力保护中的临床应用提供理论依据, 为未来构建生育力保护多模态干预方案提供新范式。

【关键词】 子宫腺肌病; 生育力保护; 中医药; 不孕

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Research progress on fertility protection in adenomyosis with traditional Chinese medicine

Li Danyun¹, Zhou Jieyun², Sun Xiaochun¹, Zhong Ruihua², Zhuang Mengfei¹, Huang Shenghui¹, Zhang Tingting¹, Cao Yang¹

¹ Department of Gynecology, Yueyang Hospital of Integrated Traditional Chinese and Western Medicine, Shanghai University of Traditional Chinese Medicine, Shanghai 200437, China; ² Reproductive Pharmacology Group, Institute of Pharmaceuticals and Medical Devices, Shanghai Institute of Biomedical Technology, Shanghai 200032, China

Corresponding author: Cao Yang, Email: cindy8813966@126.com

【 Abstract 】 Adenomyosis is one of the significant causes of decreased fertility in women of reproductive age. Its pathological mechanisms involve anatomical abnormalities and an imbalance in the local uterine microenvironment, leading to embryo implantation failure and adverse pregnancy outcomes. This article systematically reviews the theoretical and practical progress of traditional Chinese medicine (TCM) in fertility protection for adenomyosis. Based on the core pathogenesis of "Kidney Deficiency-Blood Stasis-Thoroughfare and Conception Vessel Impairment", TCM adopts the treatment principle of "tonifying the kidney, activating blood circulation, and combining elimination with supplementation". Treatment strategies are dynamically adjusted according to the menstrual cycle, integrating comprehensive interventions such as oral herbal medicine, external therapies, and emotional regulation. Clinical evidence indicates that through a three-level management strategy, TCM can participate in the entire process of fertility protection for patients with adenomyosis. It effectively ameliorates lesion fibrosis, synergizes with assisted reproductive technology to improve pregnancy rates, enhances endometrial receptivity and ovarian reserve function, and reduces the risk of postoperative recurrence. This review aims to provide a theoretical basis for the clinical application of TCM in fertility protection for adenomyosis and offer a new paradigm for constructing multimodal intervention strategies for fertility preservation in the future.

【 Key words 】 Adenomyosis; Fertility protection; Traditional Chinese medicine; Infertility

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基于巨噬细胞极化探讨中药治疗多囊卵巢综合症的免疫机制研究进展

甄喜娜¹ 于艺² 相珊¹ 连方²

¹ 山东中医药大学第一临床医学院, 济南 250011; ² 山东中医药大学附属医院中西医结合生殖与遗传中心, 济南 250011

通信作者: 连方, Email: lianfangbangong@163.com

【摘要】 多囊卵巢综合征 (polycystic ovary syndrome, PCOS) 是育龄期女性常见的内分泌代谢紊乱性疾病, 临床以月经异常、高雄激素血症、胰岛素抵抗及排卵障碍为主要特征, 其发病机制涉及慢性低度炎症、胰岛素抵抗与高雄激素血症之间的恶性循环。近年研究表明, 巨噬细胞极化在 PCOS 病理过程中发挥关键作用, 与卵巢局部微环境紊乱及全身代谢异常密切相关。中医药通过多靶点、多通路调控优势, 在改善 PCOS 患者内分泌代谢紊乱方面展现出显著疗效。本文系统综述近 5 年中医药调节巨噬细胞极化干预 PCOS 的分子机制研究进展, 以期阐明 PCOS 发病机制及开发靶向治疗策略提供理论依据和研究思路。

【关键词】 中草药; 多囊卵巢综合征; 巨噬细胞; 免疫; 炎症

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Research progress on the immune mechanism of traditional Chinese medicine in treating polycystic ovary syndrome based on macrophage polarization

Zhen Xina¹, Yu Yi², Xiang Shan¹, Lian Fang²

¹ The First Clinical Medical College of Shandong University of Traditional Chinese Medicine, Jinan 250011, China; ² Integrated Traditional Chinese and Western Medicine Reproductive and Genetic Center, Affiliated Hospital of Shandong University of Traditional Chinese Medicine, Jinan 250011, China

Corresponding author: Lian Fang, Email: lianfangbangong@163.com

【Abstract】 Polycystic ovary syndrome (PCOS) is a common endocrine and metabolic disorder among women of reproductive age, clinically characterized by menstrual abnormalities, hyperandrogenemia, insulin resistance, and ovulatory dysfunction. Its pathogenesis involves a vicious cycle between chronic low-grade

inflammation, insulin resistance, and hyperandrogenemia. Recent studies indicate that macrophage polarization plays a critical role in the pathological process of PCOS, closely associated with ovarian microenvironment dysregulation and systemic metabolic disturbances. Traditional Chinese medicine (TCM) demonstrates significant therapeutic effects in ameliorating endocrine and metabolic disorders in PCOS patients through its multi-target and multi-pathway regulatory advantages. This article systematically reviews research progress over the past five years on the molecular mechanisms by which TCM modulates macrophage polarization to intervene in PCOS, aiming to provide a theoretical basis and research insights for elucidating PCOS pathogenesis and developing targeted treatment strategies.

【 Key words 】 Chinese herbal medicine; Polycystic ovary syndrome; Macrophage; Immunity; Inflammation

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综述

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促性腺激素释放激素神经元在多囊卵巢综合征病理生理机制作用的研究进展

和雪琴^{1,2} 姜艳茹¹ 李佳林¹ 杨蕊¹

¹北京大学第三医院妇产科生殖医学中心 国家妇产科临床医学研究中心, 北京 100191; ²丽江市人民医院妇科, 丽江 674100

通信作者: 杨蕊, Email: yrjeff@126.com

【摘要】 多囊卵巢综合征 (polycystic ovary syndrome, PCOS) 是一种在育龄女性中常见的内分泌和代谢性紊乱疾病, 其主要临床表现包括月经紊乱、不孕及多毛等, 影响女性生殖健康及生活质量。目前, PCOS 的发病机制尚未完全阐明, 但早发现、早诊断、早治疗对改善 PCOS 患者预后至关重要。近年来研究表明, 下丘脑促性腺激素释放激素 (gonadotropin-releasing hormone, GnRH) 神经元的异常活动, 可能导致下丘脑-垂体-卵巢轴功能紊乱, 是 PCOS 发病的重要病理生理机

制之一。本文探讨了 GnRH 神经元在 PCOS 病理生理过程中的调控作用及其机制，旨在为 PCOS 的发病机制和治疗提供新的思路。

【关键词】 多囊卵巢综合征； 促性腺激素释放激素神经元； 神经内分泌； 黄体生成素

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Advances in the role of gonadotropin-releasing hormone neurons in the pathophysiological mechanisms of polycystic ovary syndrome

He Xueqin^{1,2}, Lou Yanru¹, Li Jialin¹, Yang Rui¹

¹ Center for Reproductive Medicine, Department of Obstetrics and Gynecology, Peking University Third Hospital; National Clinical Research Center for Obstetrics and Gynecology, Beijing 100191, China; ² Department of Gynecology, Lijiang People's Hospital, Lijiang 674100, China

Corresponding author: Yang Rui, Email: yrjeff@126.com

【Abstract】 Polycystic ovary syndrome (PCOS) is a prevalent endocrine and metabolic disorder among women of reproductive age. Its primary clinical manifestations include menstrual irregularities, infertility, and hirsutism, significantly affecting female reproductive health and quality of life. Although the pathogenesis of PCOS remains unclear, early detection, diagnosis, and treatment are crucial for improving patient outcomes. Recent studies indicate that abnormal functioning of hypothalamic gonadotropin-releasing hormone (GnRH) neurons may disrupt the hypothalamus-pituitary-ovary axis, representing a key pathophysiological mechanism underlying the development of PCOS. This study reviews the regulatory role and mechanisms of GnRH neurons in the pathophysiology of PCOS, aiming to provide new insights into the pathogenesis and potential therapeutic approaches for PCOS.

【Key words】 Polycystic ovary syndrome; Gonadotropin-releasing hormone neurons; Neuroendocrine; Luteinizing hormone

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整合素蛋白调控胚胎种植的机制研究进展

高利利 刘加宾 苗苗 王平 王燕 辛晓凤 张庆军 曹江 吴春蕾

山东第二医科大学附属中医院妇二科, 潍坊 261000

通信作者: 吴春蕾, Email: 18222515187@163.com

【摘要】 胚胎种植是哺乳动物生殖过程中的关键环节, 其成功依赖于胚胎-子宫内膜间的精确互作。整合素作为介导细胞-细胞外基质黏附与信号转导的核心受体家族, 在胚胎种植中发挥多重调控作用。整合素通过直接作用或相关通路介导胚胎的迁移、黏附及侵袭。整合素表达异常与多种生殖障碍性疾病密切相关, 如不孕、反复种植失败、多囊卵巢综合征、子宫内膜异位症等。此外, 本文还总结了针对整合素的潜在治疗策略, 为临床诊治提供新思路。

【关键词】 整合素; 胚胎种植; 子宫内膜容受性; 生殖障碍; 中医药干预

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Research advances in the mechanisms of integrin proteins regulating embryo implantation

Gao Lili, Liu Jiabin, Miao Miao, Wang Ping, Wang Yan, Xin Xiaofeng, Zhang Qingjun, Cao Jiang, Wu Chunlei

Gynecology Department 2, Weifang Hospital of Traditional Chinese Medicine, Shandong Second Medical University, Weifang 261000, China

Corresponding author: Wu Chunlei, Email: 18222515187@163.com

【 Abstract 】 Embryo implantation is a critical step in mammalian reproduction, the success of which relies on precise interactions between the embryo and endometrium. Integrins, as a key receptor family mediating cell-extracellular matrix adhesion and signal transduction, play multifaceted regulatory roles in embryo implantation. They directly or indirectly orchestrate embryo migration, adhesion, and invasion through integrin-mediated pathways. Aberrant integrin expression is closely associated with various reproductive disorders, including infertility, recurrent implantation failure, polycystic ovary syndrome, and endometriosis. Furthermore, this review summarizes potential therapeutic strategies targeting integrins, providing novel insights for clinical diagnosis and treatment.

【 Key words 】 Integrin; Embryo implantation; Endometrial receptivity; Reproductive disorders; Traditional Chinese medicine intervention

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生命之光映新程 奋楫争先谱华章

寒辞去冬雪, 暖带入春风。值此新春肇启之际, 作为《中华生殖与避孕杂志》总编辑, 我谨向一路同行的编委专家、审稿学者、作者与读者, 向所有以科学之心守护生命起源的同道, 致以最诚挚的新春问候与美好祝福!



2025年是“十四五”规划收官之年,也是本刊踔厉奋发、深耕细作的一年。面对生育政策调整、不孕问题凸显、基因检测与人工智能等新技术蓬勃发展的时代背景,生殖医学领域迎来深刻变革。我们始终坚守“守护生命起源”的初心,致力于搭建临床实践、科学创新与社会需求的学术桥梁,以专栏为刃、以指南共识为盾,在六个高地打响攻坚战,先后围绕ART与AI、生殖医学伦理、生殖衰老、男性不育、生殖遗传和子宫内膜损伤性疾病展开专栏讨论;适逢中华医学会成立110周年,我们也以扎实的工作为其增添了一笔生动的注脚。年内发布9部指南与共识,3篇论文入选“领跑者5000”,1篇佳作与3项审稿案例荣获“海上医刊”奖项——这些数字不仅反映了学科内涵的持续深化,更点亮了无数家庭的生育希望。

2025年,《中华生殖与避孕杂志》更是首次同时入选中国科协“提能拓展项目”与“2025年度科技期刊双语传播工程”——双项目加持,为学术声音插上跨语言、跨媒介的翅膀;11篇高质量论文搭乘双语工程的快车,从中文语境驶向国际视野,让中国生殖医学的创新成果在全球舞台被看见、被引用、被验证。项目不仅带来资金与资源,更带来一条直通世界的传播高速,为期刊后续的高质量发展奠定坚实平台。

更令人欣慰的是,本刊微信公众号已汇聚4.3万名专业订阅者,构建起高黏性垂直学术社群。依托这一平台,杂志联合学界推出“生殖质量论坛”“生殖大家谈”“COS关键问题训练营”等线上线下学术活动,并持续运营“学术动态”“育见前沿”“共贺新声”等专栏,系统推介国内外高水平研究成果,及时呈现专家解读与学术观点。视频摘要的上线,以多模态形式生动呈现论文核心,推动学术内容“破圈”传播。杂志作为协办单位,参与中国康复医学会生殖健康专业委员会举办的首届生殖健康科普大赛,将生殖领域循证知识转译为大众可感、可用、可信的“家常话”,将专业化科技传播与大众化科普并举,切实彰显科技期刊从提升学术影响力走向社会影响力的责任与担当。

展望 2026 年，我们将继续坚守初心，在期刊高质量发展征程上笃行不怠。通过重点专栏、权威述评与特约专论同步推进，持续输出前沿学术观点，强化学术引领力；进一步发挥网络优先出版优势，缩短发表周期，让成果第一时间与读者见面；通过专题手册线下投放、视频摘要和精准邮件推送等方式，构建立体化传播矩阵，让论文在纸上落脚，在云端生根。

山水万程，步履不停。生殖健康事业关乎千家万户的幸福，每一场学术研讨、每一篇科研论文、每一次精准传播，都可能成为托举新生命的方舟。让我们继续携手并肩，在新的一年里以更高远的视野、更笃定的行动，把论文写在祖国大地上，把成果送进临床最前线，把希望植入每一颗渴望生命的心。

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