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Review article

Antral follicle count in predicting appropriate dose of gonadotropin in in vitro fertilization cycles[☆]



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ABSTRACT

Introduction: Controlled ovarian stimulation is an essential part of in vitro fertilization (IVF) cycles. The aim of this process is to permit follicular aspiration of approximately 8–10 oocytes. Individual women have different ovarian responses based on their ovarian reserves. Low doses of exogenous follicle-stimulating hormone (FSH) may lead to cancellation of an IVF cycle as a result of insufficient response, and high doses may also lead to cancellation due to the risk of ovarian hyperstimulation syndrome. Knowing the patient's ovarian response permits the use of individually tailored doses of gonadotropin, resulting in decreased occurrence of inappropriate ovarian responses.

Objective: To conduct a systematic review of antral follicle count (AFC) performance in adjusting the dose of gonadotropins to prevent inadequate responses in IVF cycles.

Method: A systematic review was conducted of studies published in the last 13 years that appraised AFC performance in adjusting the dose of gonadotropins to prevent inadequate responses in IVF cycles. The databases consulted were Medline, LILACS, SciELO and Pubmed. Search descriptors were “antral follicle count” and “ovarian hyperstimulation syndrome”.

Results: 131 articles were found. Five articles published between 2000 and 2013 were selected.

Conclusion: AFC appears to perform well in adjusting the dose of exogenous gonadotropins to prevent inappropriate responses in IVF cycles.

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Contagem dos folículos antrais na predição das doses apropriadas de gonadotrofinas em ciclos de fertilização in vitro

R E S U M O

Palavras-chave:

Fertilização in vitro
Contagem de folículo antral
Individualização
Síndrome da hiperestimulação ovariana

Introdução: A estimulação ovariana controlada é parte essencial de ciclos de fertilização in vitro (FIV). O objetivo deste processo é permitir a aspiração folicular de aproximadamente 8–10 oócitos. As mulheres têm respostas diferentes e individuais, baseadas em suas reservas ovarianas. Baixas doses exógenas de hormônio folículo estimulante (FSH) podem levar ao cancelamento do ciclo de FIV como resultado de resposta insuficiente e altas doses também podem levar ao cancelamento devido ao risco da síndrome de hiperestimulação ovariana. O conhecimento da resposta ovariana das pacientes permite o uso de doses individuais adaptadas de gonadotrofinas, resultando em diminuição da ocorrência de respostas inadequadas do ovário.

Objetivo: Realizar revisão sistemática do desempenho da contagem dos folículos antrais (CFA) no ajuste da dose das gonadotrofinas para evitar respostas inadequadas em ciclos de FIV.

Método: Realizou-se revisão sistemática de estudos publicados nos últimos 13 anos que avaliaram o desempenho da CFA no ajuste das doses de gonadotrofinas para evitar respostas inadequadas em ciclos de FIV. As bases de dados consultadas foram Medline, LILACS, SciELO e Pubmed. Os descritores de pesquisa foram “contagem de folículo antral” e “Síndrome de hiperestimulação ovariana”.

Resultados: Foram encontrados 131 artigos. Cinco artigos publicados entre 2000 e 2013 foram selecionados.

Conclusão: A CFA parece ter um papel importante no ajuste das doses de gonadotrofinas exógenas para evitar respostas inapropriadas em ciclos de FIV.

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Introduction

Controlled ovarian stimulation is an essential part of in vitro fertilization (IVF) cycles; the objective of this procedure is to obtain a reasonable number of oocytes that can be fertilized. In clinical practice, specialist physicians generally rely on their experience to select the initial dose of gonadotropins to be used in the cycle. There is no consensus in the literature about the optimal dose of follicle stimulating hormone (FSH) in follicular stimulation to retrieve an acceptable number of oocytes. Reports in the literature have considered the recovery of 8–10 oocytes (range: 5–14) per cycle of stimulation^{1–3} to be adequate.

Women differ markedly in their ovarian reserves, and consequently present different responses to pharmaceutical stimulation of the ovaries. The occurrence of a low response to gonadotropins may result in cancellation of the cycle. Administration of higher doses of exogenous FSH may also lead to cancellation of the cycle due to the risk of ovarian hyperstimulation syndrome (OHSS).^{1,4}

Cytokines and high levels of vascular endothelial growth factor (VEGF) released by the corpus luteum in the stimulated follicles lead to an increase in vascular permeability which is characteristic of OHSS.^{5–9} This disorder is usually self-limiting but may extend over a long period, mainly in cycles with conception.⁶ Its incidence has increased with the expansion of assisted reproduction techniques.⁷ Mild and moderate OHSS forms occur in 20–33% and 3–6% of all ovarian stimulation

cycles, respectively, while the severe form of the syndrome may occur in 0.1–2% of IVF cycles.⁴

An estimate of ovarian response is possible by ovarian reserve tests (ORT). Among the various ORT available, the oldest is dosage of basal FSH. Antral follicle count (AFC) and serum levels of anti-Müllerian hormone (AMH) were introduced more recently.⁴

AFC can be used as a screening test to detect probable poor responders, normal responders, or hyper responders, and has the best predictive value for the number of oocytes that will be retrieved in IVF cycles. AFC does not appear to undergo significant changes during a menstrual cycle, especially when only the small antral follicles (2–6 mm) are counted.^{10–13}

With knowledge about the patient's ovarian response, individually tailored doses of gonadotropin can be used, resulting in reduced occurrence of inappropriate ovarian responses, fewer canceled cycles, reduced occurrence of OHSS, performance of fewer cycles with little chance of success, and improvements in pregnancy rates and the overall cost-effectiveness ratio for IVF programs.⁴ The objective of this study is to review the performance of antral follicle counting in adjusting the dose of gonadotropins to prevent inappropriate responses in IVF cycles.

Method

A systematic review was conducted of studies published from January 2000 to December 2013 in English, Portuguese

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