

# 中医针灸对IVF疗效的影响

## The impact of TCM & acupuncture on IVF outcome

*Acupuncture: when classical meets modern*

Acupuncture: when classical meets modern

# 人类试管婴儿的发展史

- 1785年 首次宫内人工授精(IUI)
- 1969年 首例人类体外受精(IVF)。
- 1973年 澳大利亚首次IVF-ET，生化妊娠
- 1977年 首例IVF-ET，异位妊娠
- 1978年 第一个IVF-ET在英国出生
- 1980年 首次药物诱导超排卵后IVF-ET
- 1983年 第一个冷冻胚胎婴儿
- 1984年 第一个捐赠卵子的婴儿，一个没有卵巢的女性
- 1992年 第一次胞浆内单精子注射(ICSI)
- 1997年 首次卵母细胞玻璃化快速冷冻
- 2000年 首次卵母细胞体外培养成熟(IVM)
- 2004年 首例原位卵巢组织冷冻移植

# 卵母细胞玻璃化快速冷冻

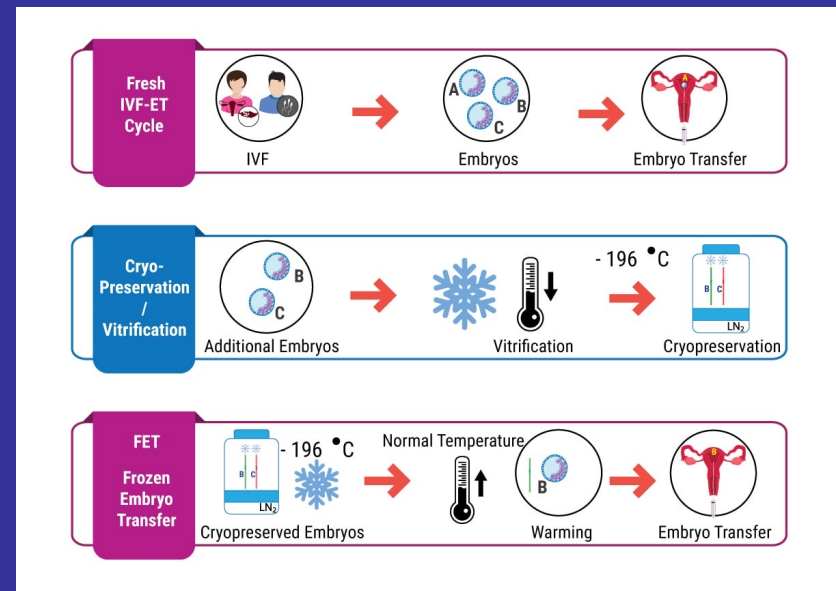
## Oocyte Cryopreservation

卵母细胞玻璃化是一项划时代的卵子与胚胎快速冷冻技术，它的出现使卵子、胚胎的存活率显著提高。在玻璃化过程中，卵母细胞被短时间置放于少量体积、超高浓度的防冻剂（DMSO和乙二醇）中，急速冷冻。细胞内的水分在瞬间速冻成为固体，使冰晶无法出现。使用常规的“慢速冷冻”，卵子和胚胎的温度会精确地以每分钟 $0.3^{\circ}\text{C}$ 下降。但玻璃化技术冷冻速度相当于“慢速冷冻”的7万倍。卵子存活率约为90%。而慢速冷冻存活率为81%，移植成功率从39%提高到50%。

对于任何正常生育的夫妇来说，每月自然受孕的几率大约是12-20%。

试管婴儿治疗，若使用新鲜受精卵，受孕机会约为30%，

使用冷冻胚胎移植，受孕机会可提高，近约65%。





# 未成熟卵母细胞体外成熟 in Vitro Maturation (IVM)

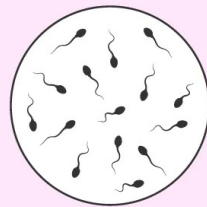
卵母细胞体外成熟培养 (IVM) 是一种在卵子成熟之前注射激素并通过收集女性卵子的辅助生殖技术。通过一个小手术取出还没有成熟的卵子，然后它们在激素的培养基中成熟，成熟的卵子通过一种叫做胞浆内精子注射 (ICSI) 的方法人工受精。它是试管婴儿领域的一项前沿技术，专门针对一些卵子成熟障碍的不孕患者，特别是那些顽固的多囊卵巢综合症、卵泡发育迟缓的患者，将未成熟的卵母细胞取出，在体外进行培养、受精，然后将胚胎移植到母亲子宫腔内生长。

# 宫腔内人工授精

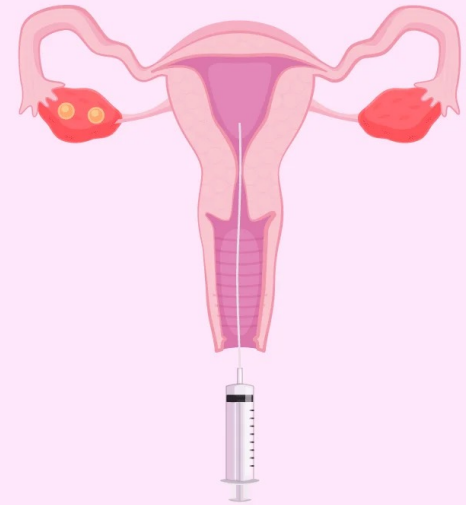
## Intrauterine insemination (IUI)



**1** Ovarian stimulation

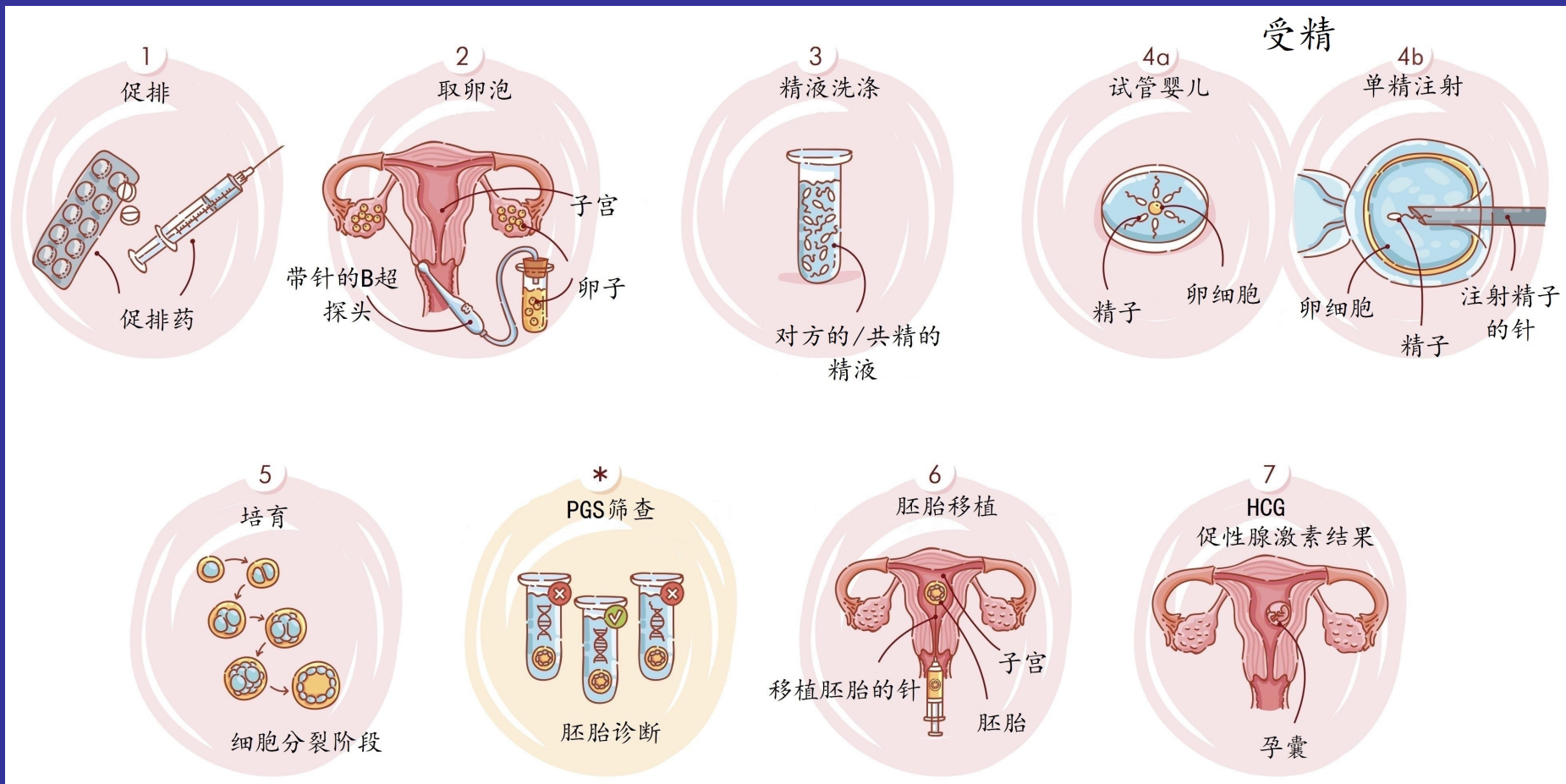


**2** Semen preparation



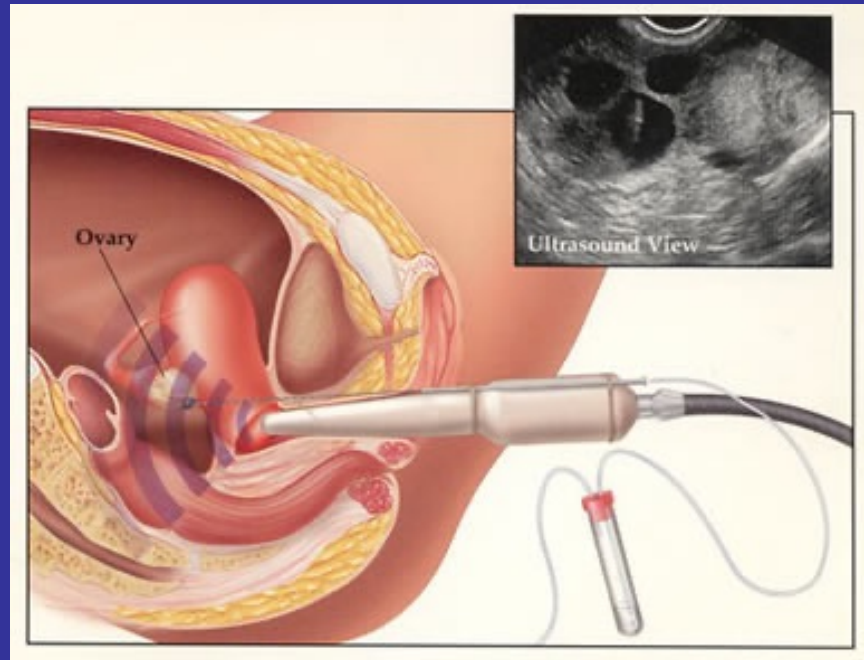
**3** Sperm introduction

# 体外受精 (IVF-ET) 的时间表



**TVOR: transvaginal oocyte (egg) retrieval**

## 阴道取卵术



# 降调节

## Suppression

为了同时获得多个质量比较好的卵泡，避免卵泡生长不同步，我们需要使用降调节治疗，采用药物干预下丘脑-垂体-卵巢轴的调节作用，从而使卵泡的生长更加容易被医生控制，争取能够获得多个同步发育成熟的卵泡，且能保证卵细胞的质量。又称“保卵针”，主要作用是防止卵巢内的卵泡过早破裂，造成“跑卵”，导致取不到优质成熟的卵子。

降调是一个术语，在月经的第一天就会发生抑制，通过服用口服避孕药来实现，这将阻止排卵一个月。这降低了囊肿的风险，并为接下来一个月的卵巢刺激做好了准备。

降调方案的选择，主要是根据患者的卵巢储备功能制定。不同的降调节方案，时间长短也都不一样。降调的满意状态，就是要看垂体功能是否完全控制下来了，卵巢是否处于最安静的状态，也就是说这个时候不能有卵泡发育。

LH（促黄体生成素）： $<5-10\text{mIU/ml}$ ；E2（雌二醇）： $<50\text{pg/ml}$ ；子宫内膜： $<5\text{mm}$ ；窦卵泡直径： $\leq 5-10\text{mm}$ ，一旦满足以上标准之后，就可以启动促排卵治疗了。



# 促性腺激素释放激素激动剂

## GnRH agonist, GnRH-a

GnRH-a与GnRH受体结合形成激素受体复合物，刺激垂体Gn急剧释放(flare up)，在首次给药的12h内，血清FSH浓度上升5倍，LH上升10倍，E<sub>2</sub>上升4倍。若GnRH-a持续使用，持续约7天，后变为抑制作用，14天内使FSH和LH降到基础值以下。则垂体细胞表面可结合的GnRH受体减少，对进一步GnRH-a刺激不敏感，即所谓降调节作用(down regulation)，使FSH、LH分泌处于低水平，卵泡发育停滞，性激素水平下降，用药7~14天达到药物性垂体-卵巢去势，由此作为临床应用的基础。停药后垂体功能会完全恢复，具有正常月经周期的妇女停药后卵巢功能的恢复约需6周。

# 促性腺激素释放激素拮抗剂 GnRH-antagonist, GnRH-ant

GnRH-ant 的作用机制，它通过竞争阻断 GnRH 受体，直接、快速抑制垂体性腺轴，给药后血浆 FSH 及 LH 水平在数小时内降低，无开始使用时对垂体的激发现象；它的抑制效果呈剂量依赖型；可在卵泡期的任一时间给药，无「点火」效应；可避免卵巢囊肿的形成；使用过程中无低雌激素症状，患者耐受性较好；保留垂体反应性，停药后垂体功能恢复快。



# 控制性

是指让卵泡发育的数量控制在一定范围内，以及同步发育，以达到让合适数量的卵泡一起发育成熟的目的。

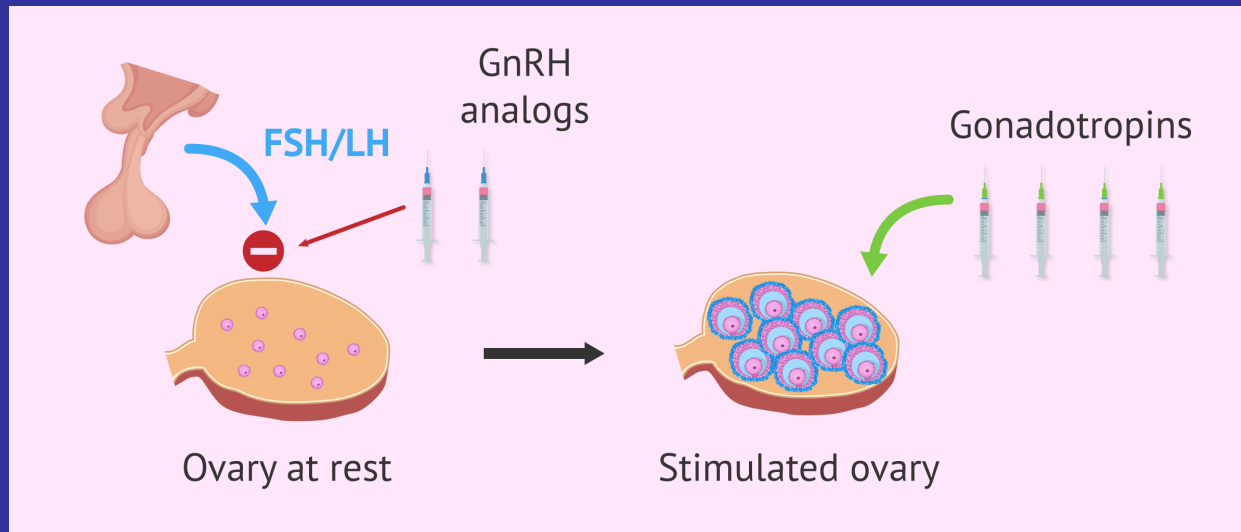


# 控制性超促排卵方案

## Controlled ovarian hyperstimulation

促排卵方案专业术语是叫“控制性超促排卵方案”。

促排卵又称控制的卵巢刺激，指以药物的手段在可控制的范围内，诱发多个卵泡的发育和成熟，其应用的对象本身多有正常的排卵功能。



# 排卵针

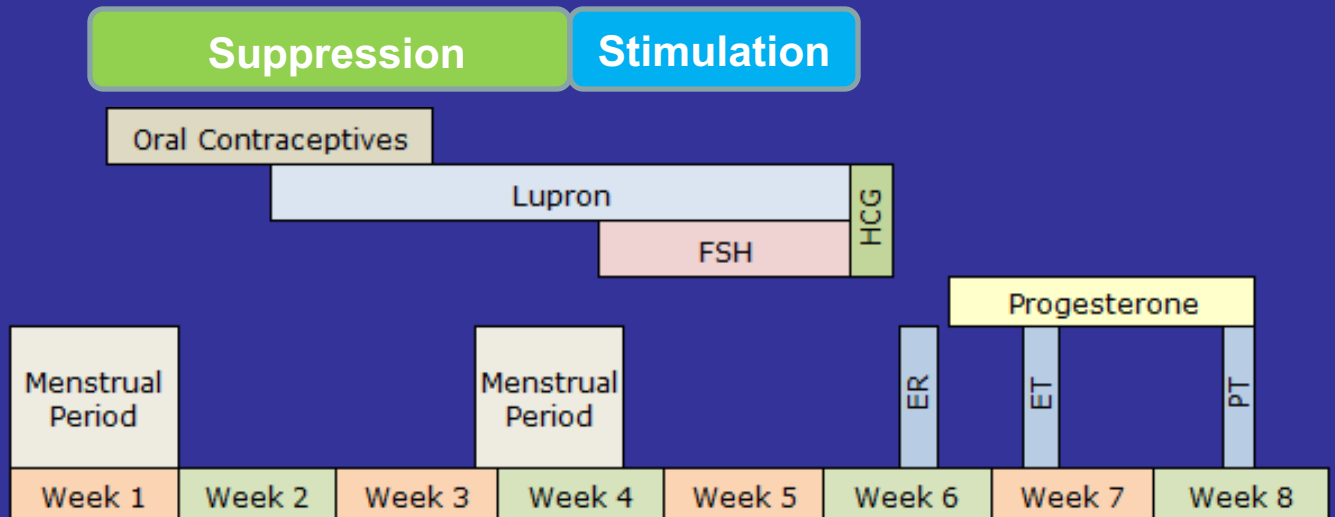
## Trigger Shot

排卵针又称“破卵针”“夜针”。IVF“触发”注射是在取卵前36小时注射hCG，它是卵子质量的重要决定因素。采卵的时机至关重要。如果给得太早，卵子就不够成熟。如果给的太晚，卵子可能“太老”，不能正常受精。在最后一步的最后，每天进行超声波检查，目的是让触发射击的时间恰到好处。通常情况下，当4个或更多的卵泡长到18到20毫米，并且雌二醇水平超过2000 pg/ML时，才会注射hCG。

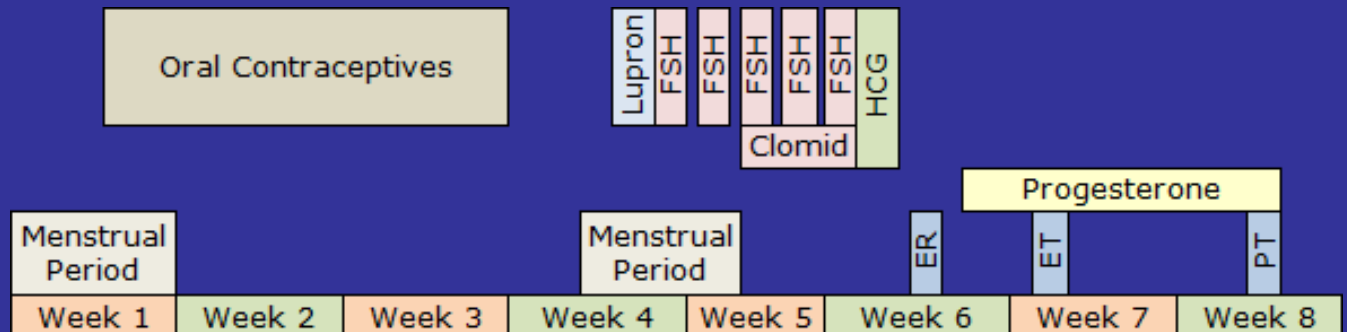
# IVF-ET (In Vitro Fertilization-Embryo Transfer ) Procedure

## IVF的程序

### Long Protocol



### Short Protocol



# 长方案

## 基本介绍

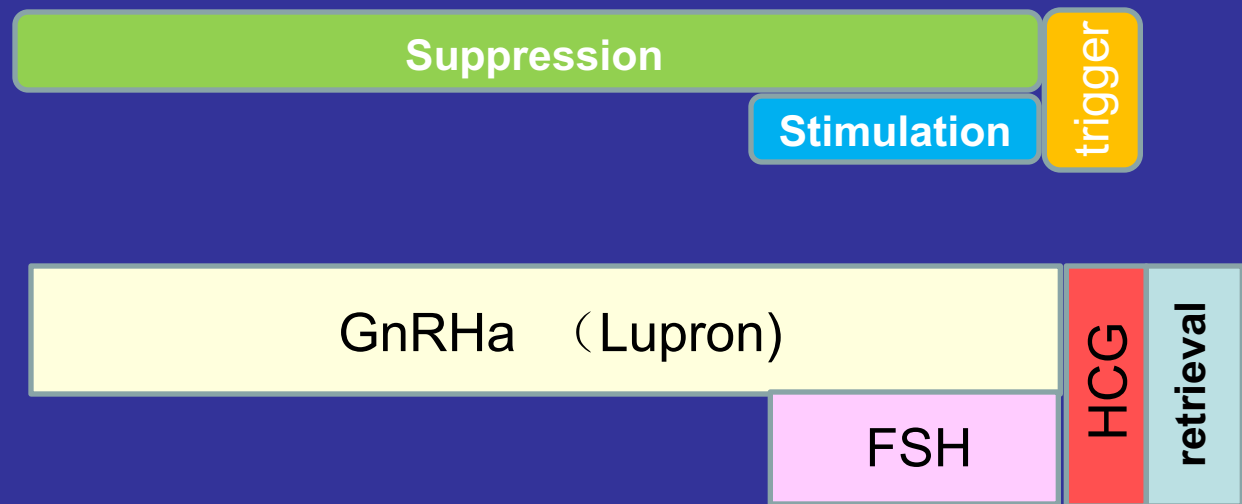
长方案前后大约需要1个月的用药时间。这是使用最多最经典的方案。长方案适用于卵巢功能较好的患者。这种用药方案利用大剂量持续性GnRHa刺激后导致的内源性促性腺激素的分泌抑制，即降调节作用。

- 1、适应人群：主要适用于卵巢储备功能较好的患者。
- 2、特点：长方案的优点在于卵泡同步，大小相对均匀，体内激素水平稳定，一般可以获得多于5个高质量卵子，可以提高累积妊娠率。

# 用法

一般从治疗周期前的黄体期或治疗周期的第2天注射GnRH $\alpha$ 来降调节。月经来潮第2天超声、FSH、LH、E2等评价降调效果，于月经第3天开始每日注射促性腺激素（Gn），当有2个直径达18mm或3个达17mm或4个达16mm卵泡时停用Gn，当晚注射HCG5000-10000IU，34-36小时后取卵。

## Long Protocol



# 短方案

## 基本介绍

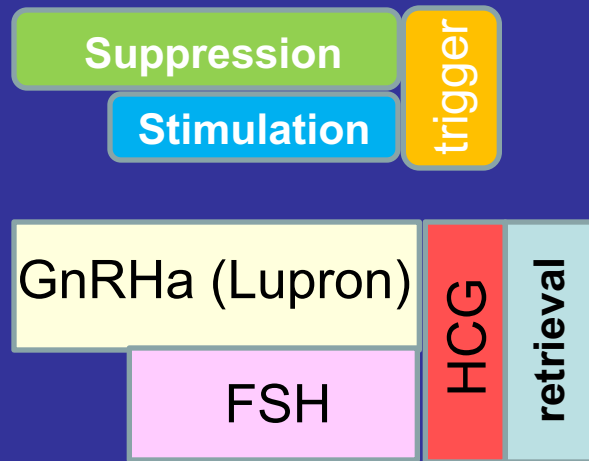
在月经的第2天开始使用GnRHa，这时利用的使GnRHa的正调作用，即GnRHa使用的早期（1-3天左右）是促使体内FSH、LH的分泌，从而加强促排卵作用；直到B超见到卵子成熟于当天（一般在晚上）注射 HCG以促使卵子成熟；HCG注射36小时后，即可取卵。

- 1、适应人群：年纪较大或卵巢反应较差的患者
- 2、特点：相对于长方案，短方案的优点在于可以保证患者在卵泡的数目不多的情况下，避免经过抑制后，压制了自身促卵泡生长激素的分泌，使卵泡不易排出或只有较少卵泡生长，使卵泡数量变得更少。

# 用法

在月经的第2天开始使用促性腺激素释放激素类似物(GnRHa)，促使体内FSH、LH的分泌。月经的第3天即开始使用促排卵药物进行促排。同时通过B超监测卵泡的生长情况，并抽血测定雌激素含量的变化，根据结果判断调整促排卵药物的使用剂量和决定HCG注射的时间，这点和长方案是一样的。

## Shot Protocol





# 微刺激方案

## 基本介绍

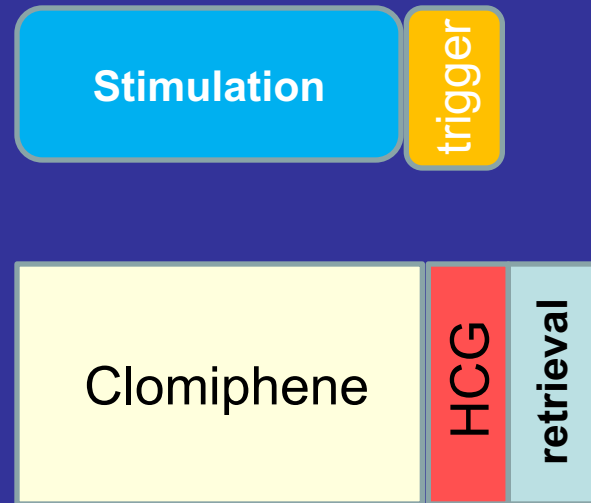
就是选择小剂量促排卵药物给予卵巢轻微的刺激。通常是从月经第3-5天开始应用HMG，促使卵泡生长，直至HCG日。该种方案适用于卵巢反应不良的患者。

- 1、适应人群：主要是卵巢功能下降者、常规方案卵巢反应不良者或既往多次常规方案促排卵后反复种植失败者。
- 2、特点：使用促排卵药物相对较少，对卵巢的刺激较轻微，可以每月连续促排卵，进而累积储存胚胎。

# 用法

月经第2-4天，根据血激素及B超的结果及患者的自身情况决定用药，一般促排卵药物不超过150U，可以加或不加口服促排卵药物，促排卵后期会加用拮抗剂以防止取卵前排卵。一般促排7-9天后打破卵针（hCG），打针后36小时左右取卵。

## Mini Protocol



# 拮抗剂方案

不进行垂体降调节，使用GnRH-Ant抑制LH早熟峰的促排卵方法，被称为“拮抗剂方案”。与经典的长方案促排卵相比，该方案用药相对简单、周期时间短、对卵巢抑制轻，可用于卵巢储备功能低下者。

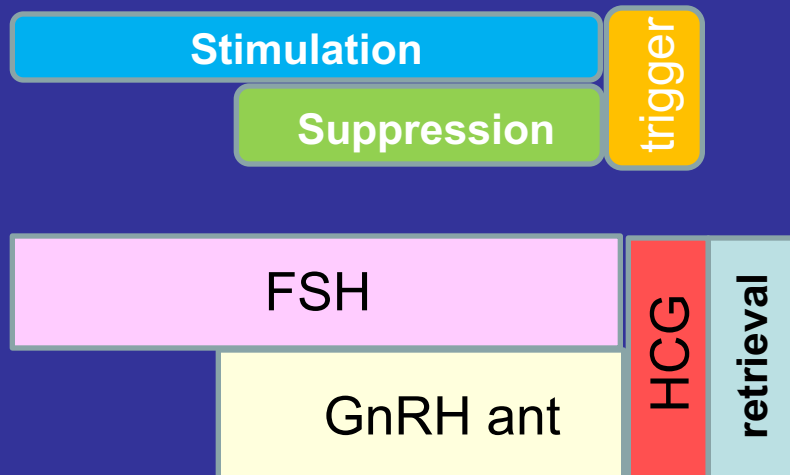
## 基 本 介 绍

- 1、适应人群：主要用于卵巢高反应人群（如多囊卵巢综合征患者）。对于正常反应、低反应及首次试管婴儿失败的患者，医生可以根据患者的具体情况选择拮抗剂方案。
- 2、特点：该方案治疗周期短（一般促排卵9天左右）、患者往返医院次数相对长方案少。如果卵泡过多发育，可以通过改变破卵针的用药方案+全胚冷冻来达到预防卵巢过度刺激综合征发生的目的，这一点是长方案所不具备的。

# 用法

月经第2-4天，根据血激素及B超的结果及患者的自身情况，医生决定启动剂量。促排卵的第5-7天后会加用拮抗剂以防止取卵前排卵，一般促排9-10天后打破卵针，打针后36小时左右取卵。

## Ant Protocol



# 自然周期方案

## 基本介绍

不使用任何药物刺激卵泡发育及诱发排卵，但必须在卵泡接近成熟时用B超密切监测卵泡发育情况，从而估计排卵准确时间，以便获取成熟卵子进行体外受精。这个方案使用的非常少。

**优点：**不受外源性激素的干扰，卵泡在生理状态下发育成熟，质量较好，不会发生卵巢过度刺激综合征。

**缺点：**由于仅有一个主导卵泡发育，只能获得一个卵子，而且常常出现取卵失败，使得妊娠率较低或不能进行体外受精。由于在自然周期必须密切监测卵泡发育及LH水平，每天须多次收集血液标本，非常繁琐。

相比之下，长方案的妊娠成功率略高于短方案。大多数人都适合采用长方案，但对于一些年纪较大或卵巢反应较差的患者，如果使用长方案，由于降调作用压制了自身促卵泡生长激素的分泌，可能会使卵泡不易发出，或只有较少卵泡生长，所以这些患者更适合采用短方案。

- 对治疗方案的反应如何
- 不孕症的诊断(子宫内膜异位症, DOR, PCOS)
- 年龄
- 体重
- 危险因素(OHSS)
- 既往成功/失败史
- 经济负担能力

**卵巢低反应**(poor ovarian response, POR)是卵巢对促性腺激素(Gn)刺激反应不良的一种病理状态,主要表现为:卵巢刺激周期发育的卵泡少、血雌激素峰值低、Gn用量多、周期取消率高、获卵数少和临床妊娠率低。

满足以下3条中的2条即可诊断POR: ①高龄( $\geq 40$ 岁)或存在卵巢反应不良的其它危险因素; ②前次IVF周期卵巢低反应,常规方案获卵数 $\leq 3$ 个; ③卵巢储备下降[窦卵泡数(AFC) $< 5\sim 7$ 个或抗苗勒管激素(AMH) $< 0.5\sim 1.1 \mu\text{g/L}$ ]。(2011年/博洛尼亚共识)

POR发病原因至今尚不十分清楚,其发病病因可能与患者年龄大、染色体和基因异常、抗透明带抗体等免疫异常、肥胖、不良环境因素损伤等有关。



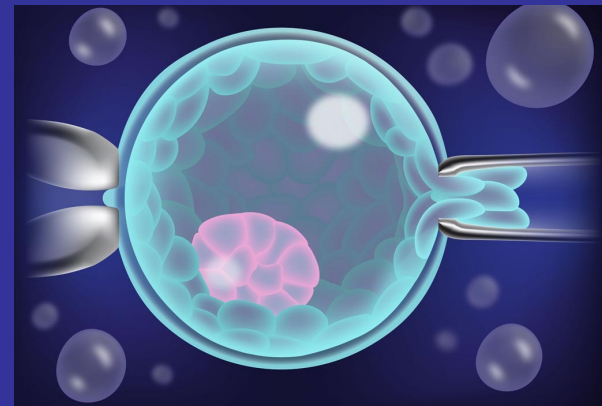
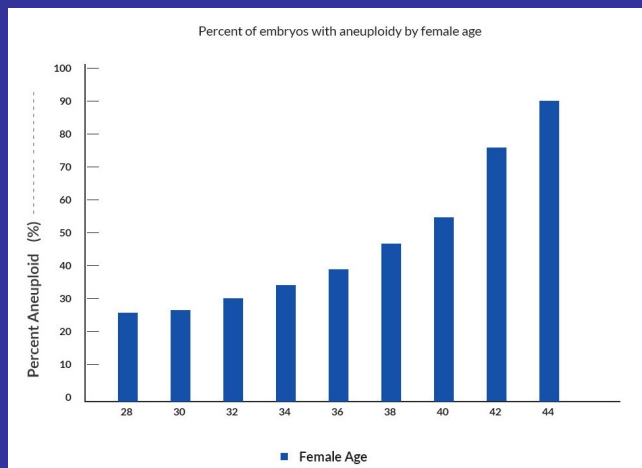
研究数据揭示表明，第一，当每个周期取出的卵子数量增加时，每个新鲜胚胎移植过程中活产率的可能性也随之增加。与5至9个卵子相比，10至19个卵子的出生率有显著增加，但当取到更多卵子时，每新鲜卵子的出生率没有显著增加或减少。

The data revealed a number of key findings. The first was that when the number of eggs retrieved per cycle increased, so did the likelihood of a live birth per fresh embryo transfer procedure. There was a significant increase in birth rates with 10 to 19 eggs compared to five to nine eggs, but there was no significant increase or decrease in birth rates per fresh transfer when greater numbers of eggs were retrieved.

# 植入前基因检测

## Preimplantation Genetic Testing (PGT)

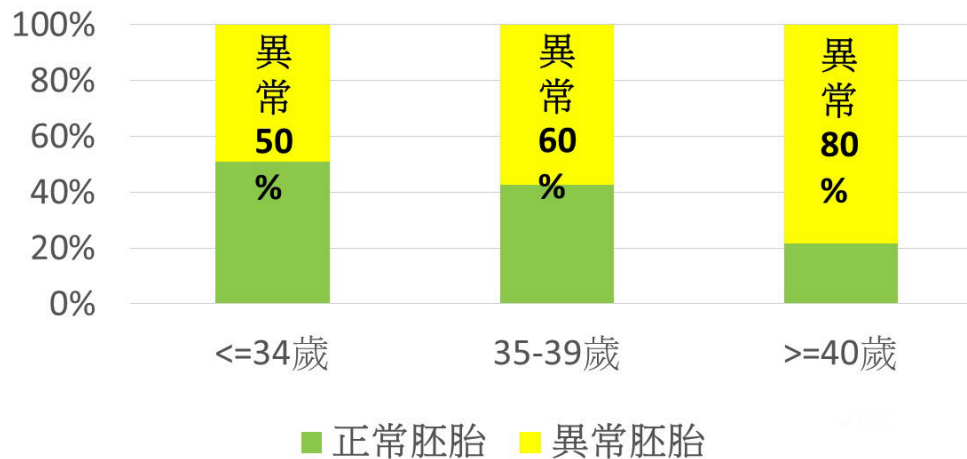
植入前基因检测包括一组用于评估胚胎移植到子宫前的基因检测。在这种方法中，对大约5-10个来自滋养层的细胞进行植入前基因检测，滋养层是产生胎盘的地方，不需要对最终产生胎儿的内部细胞团进行活检。目前没有文献报道PGT测试后对出生的儿童的健康风险。



# 什么是PGS/PGD?

通过试管婴儿方法获得的胚胎有40-60%存在染色体异常，且随着现在孕妇年龄增大，胚胎染色体异常的风险也在增高。所以植入前遗传学筛查技术开始越来越受到重视，PGD/PGS便应运而生。

## 困難懷孕時，為什麼要安排做PGS?



# 什么是NIPT?

胎儿染色体非整倍体无创基因检测（ Non-invasive Prenatal Testing NIPT ）是通过对其进行测序。那么什么是胎儿染色体非整倍体呢？染色体非整倍体是指细胞中个别染色体的增多或减少形成的染色体数目异常。通过采集 5ml 孕妇外周血，提取其中游离DNA并采用第二代高通量测序技术进行测序，通过生物信息分析，得出胎儿患“染色体非整倍体”的风险率。唐氏综合征的病因就是在患者的第21对染色体上多了1条染色体，所以称21三体综合征。

## NIPT检测对象？

- ✓ 年龄超过35岁。
- ✓ 已经有了一个染色体异常的孩子。
- ✓ 超声波检查显示胎儿可能有异常。
- ✓ 自身的染色体有异常的高危人群。
- ✓ 做过早期筛查，发现有潜在的问题。

这项测试可在妊娠以上10周的妇女中检测。

## 体外受精胚胎移植第3天还是第5天？

我们已经知道，在自然受孕时，胚胎在受精后的5-6天到达子宫。然而，在以往的IVF过程中，胚胎通常在受精后的第3天被转移回子宫。近年来在实验室培育胚胎的科学上取得了突破。

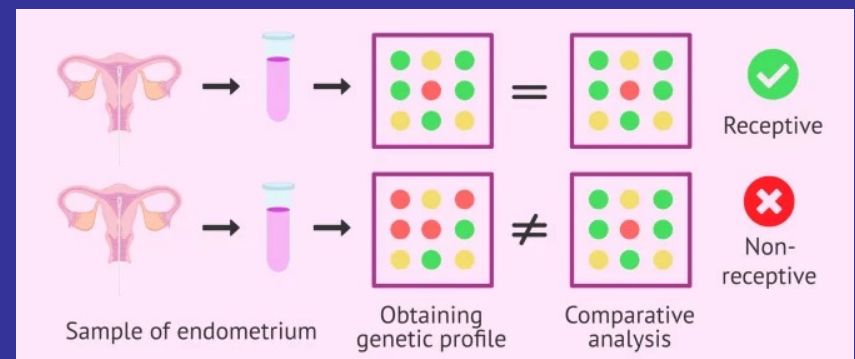
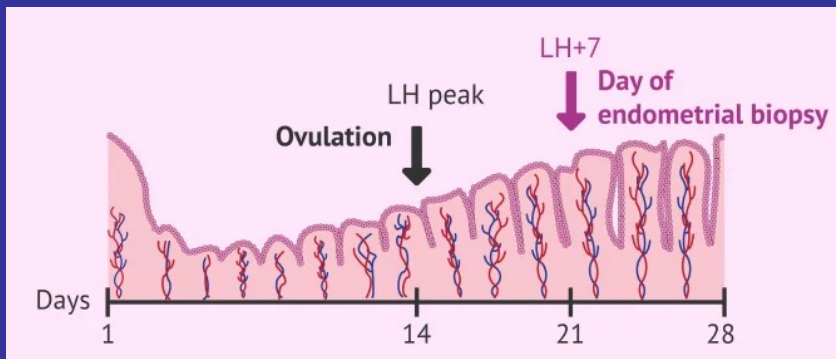
用第3天胚胎（8细胞期）形态来衡量胚胎的发育潜力有一定的限制，在这个时期移植胚胎的后期发育潜力还很难预料。体外培养时，如胚胎能逾越8细胞期，发育而成为囊胚则成为更具有生命力的胚胎。经筛选发育至囊胚的胚胎通常质量较好，移植成功率也高。另外，囊胚培养使得胚胎与女性生殖道的发育更同步，更符合生殖生理的自然环境，具有较高的着床和妊娠潜力。

# 什么是试管婴儿的子宫内膜容受性阵列检测 ( Endometrial Receptivity Analysis ERA )

## 种植窗口

只有在一段特定的时间内，可以在子宫内膜着床。  
ERA是寻找最佳胚胎移植时机的最佳诊断工具，适用于所有开始体外受精的患者。

可在患者进行植入前，检测其个人着床窗期。 ERA会分析取自子宫内膜组织样本的RNA，依RNA表现图谱，再将其分类为容受性或非容受性。它是一种基因测试，对女性子宫内膜的一小部分进行测试，以确定在体外受精周期中哪一天是移植胚胎的最佳日期。



## 谁应该考虑作ERA检测？

- 有2次或2次以上胚胎移植失败的患者；
- 对子宫内膜有顾虑的患者(例如:子宫内膜薄)；
- 高质量胚胎植入失败的患者；
- 一般来说，任何接受过体外受精治疗的病人在接受胚胎之前都可被接受子宫内膜诊断。



# 针灸对于IVF疗效的影响

**The impact of acupuncture  
on IVF outcome**

# Influence of acupuncture on the pregnancy rate in patients who undergo assisted reproduction therapy.

针灸在辅助生殖技术中对患者妊娠率的影响

Paulus WE, Zhang M, Strehler E, El-Danasouri I, Sterzik K.  
*Fertility and Sterility* 2002 Apr;77(4):721-4.

Department of Reproductive Medicine, Christian-Lauritzen-Institut, Ulm, Germany.  
paulus@reprotox.de

# Paulus's PROTOCOL PERFORMED FOR ALL E-T

## Paulus 的针灸治疗方案

<i>Time of Acupuncture</i>		<i>Acupuncture Points</i>	
<b>Pre-ET</b> 移植前  (0.25X25mm needles)		<i>Cx-6/Neiguan</i>	内关
		<i>SP-8/Diji</i>	地机
		<i>LV-3/Taichong</i>	太冲
		<i>GV-20/Baihui</i>	百会
		<i>ST-29/Guilai</i>	归来
		<i>Right ear: Uterus, Endocrine</i>	子宫, 内分泌
<b>Post-ET</b> 移植后  (0.2X13mm needles)		<i>Left ear: Shenmen, Brain</i>	神门, 脑
		<i>ST-36/Zusanli</i>	足三里
		<i>SP-6/Sanyinjiao</i>	三阴交
		<i>SP-10/Xuehai</i>	血海
		<i>LI-4/Hegu</i>	合谷
		<i>Right ear: Shenmen, Brain</i>	神门, 脑
	<i>Left ear: Uterus, Endocrine</i>	子宫, 内分泌	

# Descriptive data on acupuncture and control group (mean± SD or total number)

## 针灸组和对照组的数据说明

	Control group (n = 80)	Acupuncture group (n = 80)	Statistics
Age of patients (years)	32.1 ± 3.9	32.8 ± 4.1	NS
No. of previous cycles	2.0 ± 2.0	2.1 ± 2.1	NS
No. of transferred embryos	2.1 ± 0.5	2.2 ± 0.5	NS
IVF (n)	54	47	NS
ICSI (n)	26	33	NS
No. of cycles with male factor infertility	46	47	NS
No. of cycles with tubal disease	21	22	NS
No. of cycles with polycystic ovaries	2	2	NS
No. of cycles with unknown cause of infertility	11	9	NS
Endometrial thickness (mm)	9.9 ± 2.7	9.1 ± 2.4	NS
Plasma estradiol on day of embryo transfer (pg/mL)	1001 ± 635	971 ± 832	NS
Pulsatility index of uterine arteries (PI) before embryo transfer	2.00 ± 0.56	2.02 ± 0,45	NS
Pulsatility index of uterine arteries (PI) after embryo transfer	2.19 ± 0.52	2.22 ± 0,44	NS
Pregnant	21/80 (26.3%)	34/80 (42.5%)	P= .03

NS = not significant ( $P > .05$ ).

Paulus. *Acupuncture in ART.* *Fertil Steril* 2002.

Influence of acupuncture on the pregnancy rate in patients who undergo assisted reproduction therapy. Paulus WE, Zhang M, Strehler E, El-Danasouri I, Sterzik K. *Fertil Steril*. 2002 Apr;77(4):721-4.

Department of Reproductive Medicine, Christian-Lauritzen-Institut, Ulm, Germany.  
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# Westergaard's PROTOCOL PERFORMED FOR ALL E-T

## Westergaard 的针灸治疗方案

<i>Time of Acupuncture</i>		<i>Acupuncture Points</i>	
<b>Pre-ET</b>	移植前	<i>Du-20/Baihui</i>	百会
		<i>PC-6/Neiguan</i>	内关
		<i>ST-29/Guilai</i>	归来
		<i>SP-8/Diji</i>	地机
		<i>LV-3/Taichong</i>	太冲
<b>Post-ET</b>	移植后	<i>LI-4/Hegu</i>	合谷
		<i>SP-10/Xuehai</i>	血海
		<i>ST-36/Zusanli</i>	足三里
		<i>SP-6/Sanyinjiao</i>	三阴交
<b>2 days after ET</b>	移植2天后	<i>Du-20/Baihui</i>	百会
		<i>SP-6/Sanyinjiao</i>	三阴交
		<i>ST-29/Guilai</i>	归来
		<i>Ren 3/zhongji</i>	中极
		<i>SP-10/Xuehai</i>	血海
<b>(5 days after oocyte retrieval)</b>		<i>ST-36/Zusanli</i>	足三里
		<i>LI-4/Hegu</i>	合谷

**ACU 1  
group**

**ACU 2  
group**



# Acupuncture on the day of embryo transfer significantly improves the reproductive outcome in infertile women: a prospective, randomized trial

不孕妇女在胚胎移植中运用针灸显著地改善生殖结果：  
一个前瞻性随机对照研究

**TABLE 2**

Demographic characteristics of the study population.

Characteristic	Control group (n = 87)	ACU 1 (n = 95)	ACU 2 (n = 91)
Age (y), median (range)	37 (27–45)	37 (24–45)	37 (27–45)
BMI (kg/m <sup>2</sup> ), median (range)	23 (18–32)	23 (16–40)	22 (18–34)
Duration of infertility (y), median (range)	4 (1–9)	3 (1–9)	4 (1–10)
Primary infertility (%)	37	44	45
Previous IVF attempts (%)			
0	36	37	30
≥1	64	67	70
Causes of infertility (%)			
Tubal	19	15	22
Anovulatory	19	11	14
Endometriosis	0	1	4
Male	20	24	19
Mixed	16	14	14
Idiopathic	26	30	26

Westergaard. Acupuncture on ET day improves IVF outcome. *Fertil Steril* 2006.



# Descriptive data on acupuncture and control group

## 针灸组和对照组的数据说明

**TABLE 3**

### Oocytes and embryos retrieved per cycle

Variable	Control group (n = 87)	ACU 1 (n = 95)	ACU 2 (n = 91)
Oocytes retrieved	10.6 ± 0.7	10.4 ± 0.3	10.7 ± 0.6
ICSI, n (%)	36 (37)	42 (44)	35 (38)
Oocytes fertilized	7.4 ± 0.6	7.0 ± 0.4	7.6 ± 0.6
Embryos transferred	2.0 ± 0.1	2.1 ± 0.05	2.1 ± 0.06
Embryos cryo preserved	2.4 ± 0.4	1.9 ± 0.3	2.4 ± 0.4
Transferable embryos (transferred + cryopreserved)	4.3 ± 0.4	4.0 ± 0.3	4.5 ± 0.4

Note: Data are mean ± SEM unless otherwise noted.

Westergaard. Acupuncture on ET day improves IVF outcome. *Fertil Steril* 2006.

*Fertil Steril*, 2006 May;85(5):1341-6. Epub 2006 Apr 5.

**Acupuncture on the day of embryo transfer significantly improves the reproductive outcome in infertile women: a prospective, randomized trial.**

Westergaard LG<sup>1</sup>, Mao Q, Kroglund M, Sandrini S, Lenz S, Grinsted J.

<sup>1</sup>Fertility Clinic Trianglen, Hellerup, Denmark. I.g.westergaard@dadlnet.dk



# Reproductive outcomes per ET

## 胚胎移植的分类生殖结果

**TABLE 4**

**Reproductive outcomes per ET.**

<b>Reproductive outcome</b>	<b>Control group (n = 87)</b>	<b>ACU 1 (n = 95)</b>	<b>ACU 2 (n = 91)</b>
Positive pregnancy test	24 (28) <sup>a</sup>	40 (42) <sup>a</sup>	36 (40)
Clinical pregnancy	21 (24) <sup>b</sup>	37 (39) <sup>b</sup>	33 (36)
Early pregnancy loss, n (% of positive pregnancy tests)	5 (21)	6 (15)	12 (33)
Ongoing pregnancy/delivery	19 (22) <sup>c</sup>	34 (36) <sup>c</sup>	24 (26)
Implantation rate, % (no. of gestational sacs/no. of transferred embryos)	18 (32/178)	21 (42/200)	19 (36/192)

Data are n (%), unless otherwise noted. Fisher's exact test (two-tailed):

<sup>a</sup>  $P = .044$ .

<sup>b</sup>  $P = .038$ .

<sup>c</sup>  $P = .049$ .

Westergaard. Acupuncture on ET day improves IVF outcome. *Fertil Steril* 2006.



**Conclusion(s):** Clinical and ongoing pregnancy rates were significantly higher in the ACU 1 group as compared with controls; The clinical and ongoing pregnancy rates in the ACU 2 group were higher than in controls, but the difference did not reach statistical difference.

结论:ACU1组的临床和持续的怀孕率明显高对照组相比, ACU2组临床和持续的怀孕率高于对照组,但没有达到统计学差异。

Acupuncture points (Sp6 and LI4) are contraindicated in pregnancy and may therefore be unsuitable after ET. This may explain the Westergaard et al. outcome of a greater early pregnancy loss in the group who received ACU 2 days after ET.

三阴交和合谷是怀孕期的禁穴,因此可能在移植后并不适合。这也许可以解释Westergaard等在移植后第二天ACU2在组中造成更多的早期流产。

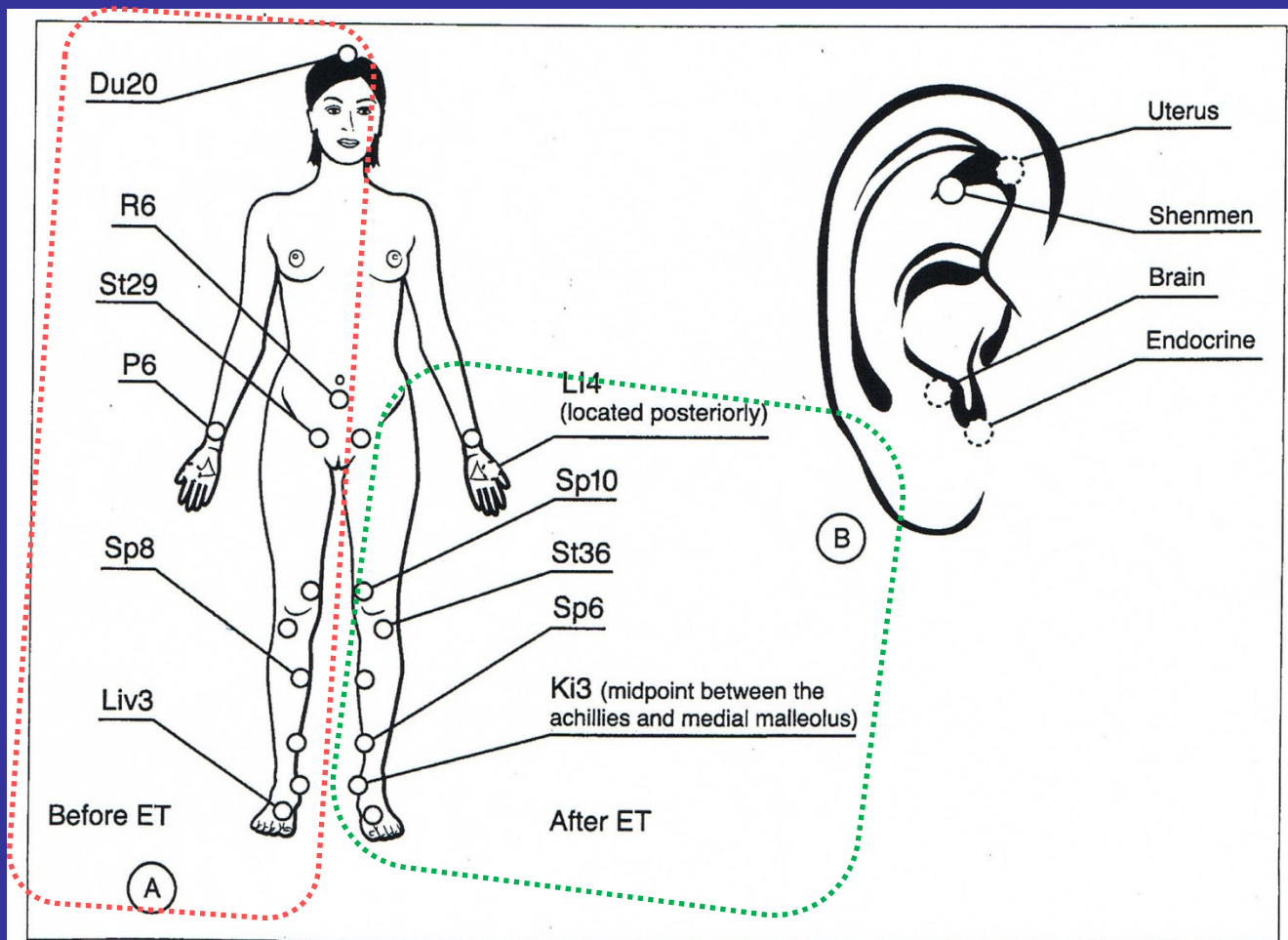
*Belinda J. Anderson, Ph.D., L.Ac.*

*Fertility and Sterility Vol. 87, No. 4, April 2007*

# Craig's PROTOCOL PERFORMED FOR ALL E-T

## Craig的针灸治疗方案

<i>Time of Acupuncture</i>	<i>Acupuncture Points</i>	
<b>Pre-ET</b>	<i>GV-20/Baihui</i>	百会
	<i>PC-6/Neiguan</i>	内关
	* <i>R-6/Qihai</i>	气海
	<i>ST-29/Guilai</i>	归来
	<i>SP-8/Diji</i>	地机
	<i>LV-3/Taichong</i>	太冲
	<i>Right ear: Uterus, Endocrine</i>	子宫, 内分泌
	<i>Left ear: Shenmen, Brain</i>	神门, 脑
<b>Post-ET</b>	<i>LI-4/Hegu</i>	合谷
	<i>SP-10/Xuehai</i>	血海
	<i>ST-36/Zusanli</i>	足三里
	<i>SP-6/Sanyinjiao</i>	三阴交
	* <i>KI-3/Taixi</i>	太溪
	<i>Right ear: Shenmen, Brain</i>	神门, 脑
<i>Left ear: Uterus, Endocrine</i>	子宫, 内分泌	



**Figure 1** Acupuncture protocol. (A) Illustration of acupoints used before (left side of figure) and after (right side of figure) embryo transfer, which represent the Paulus protocol<sup>4</sup> with the addition of acupoints R6 and Ki3. (B) Four auricular acupoints were used both before and after embryo transfer. There were 2 on each ear before transfer and these were reversed for the treatment after embryo transfer. The dotted lines indicate the point is located behind the area indicated.

J Reproductive Med.2014 May-Jun;59(5-6):313-20.

**Acupuncture performed before and after embryo transfer: a randomized controlled trial.**

Craig LB, Rubin LE, Peck JD, Anderson M, Marshall LA, Soules MR

Division of Reproductive Endocrinology and Infertility, University of Washington, Seattle, USA

**Table II** Summary of Pregnancy Outcomes in the Control and Acupuncture Groups

Intent-to-treat analysis	Control group (n = 56)	Acupuncture group (n = 57)	p Value <sup>c</sup>
	No. of events/no. of patients <sup>d</sup> (%)	No. of events/no. of patients <sup>d</sup> (%)	
Positive pregnancy test <sup>a</sup>	40/56 (71.4)	29/56 (51.8)	0.027
Clinical pregnancy <sup>b</sup>	35/54 (64.8)	24/55 (43.6)	0.045
Live birth	28/50 (56.0)	18/50 (36.0)	0.033

Per protocol analysis	(n = 50)	(n = 51)	p Value <sup>c</sup>
	No. of events/no. of patients <sup>d</sup> (%)	No. of events/no. of patients <sup>d</sup> (%)	
Positive pregnancy test <sup>a</sup>	40/50 (80.0)	28/51 (54.9)	0.007
Clinical pregnancy <sup>b</sup>	35/48 (72.9)	23/50 (46.0)	0.007
Live birth <sup>c</sup>	28/43 (65.1)	18/46 (39.1)	0.014

<sup>a</sup>Positive serum quantitative hCG > 10 mIU/mL.

<sup>b</sup>Fetal heart beat on ultrasound during the first trimester.

<sup>c</sup> $\chi^2$  analysis.

<sup>d</sup>Women with missing outcomes were excluded from the  $\chi^2$  analysis.

## RESULTS:

Compared to the control group, the treatment group had a lower pregnancy rate (43.6% vs. 64.8%,  $p = 0.045$ ). More women in the control group had live births than did those in the acupuncture group (56.0% vs. 36.0%, respectively,  $p = 0.033$ ).

\*The Acupuncture clinic was located within 5 miles of all 3 fertility centers.

结论：与对照组相比，治疗组的妊娠率较低（43.6%比64.8%， $p=0.045$ ）。女性在实际生产率，对照组比针灸组明显增高（分别为56.0%和36.0%， $p =0.033$ ）。

# So' s PROTOCOL PERFORMED FOR ALL E-T

## So的针灸治疗方案

<i>Time of Acupuncture</i>	<i>Acupuncture Points</i>	
<b>Pre-ET</b> (0.30X40mm needles)	<i>PC-6/Neiguan</i>	内关
	<i>SP-8/Diji</i>	地机
	<i>LR-3/Taichong</i>	太冲
	<i>GV-20/Baihui</i>	百会
	<i>ST-29/Guilai</i>	归来
<b>Post-ET</b>	<i>ST-36/Zusanli</i>	足三里
	<i>SP-6/Sanyinjiao</i>	三阴交
	<i>SP-10/Xuehai</i>	血海
	<i>LI-4/Hegu</i>	合谷

# Descriptive data on acupuncture and placebo group

## 针灸组和对照组的数据说明

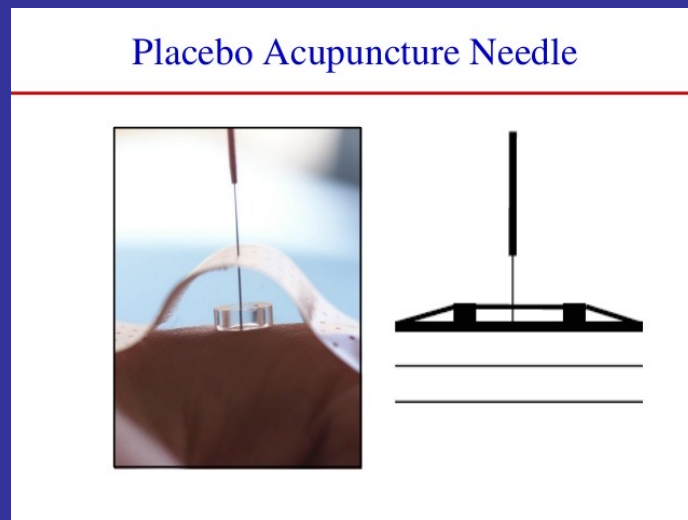
	Real Acu (n =185)	Placebo Acu (n =185)
Age (y)	36.0 (33–38)	36.0 (34–38)
Duration of infertility (y)(range)	4.0 (2.0–6.0)	4.0 (2.5–7.0)
Primary infertility (%)	118 (64)	109 (59)
ICSI	54 (29)	57 (31)
Basal FSH (IU/l)	8.1 (6.3–9.7)	7.9 (6.5–9.8)
Antral follicle count	8.0 (5–12)	8.0 (6–13)
Estradiol on day of hCG (pmol/l) )(range)	7410 (5230–11 033)	7348 (4845–11 103)
No. of oocyte Obtaineda (range)	8.0 (5–12)	7.0 (5–11)

A randomized double blind comparison of real and placebo acupuncture in IVF treatment  
*Emily Wing Sze So et al.* Department of Obstetrics and Gynaecology,  
The University of Hong Kong, Pokfulam Road, Hong Kong, People's Republic of China.  
Tel: t852-28553400; Fax: t852-28175374; E-mail: nghye@hkucc.hku.hk



# The Streitberger placebo needles

## 施特赖特贝格尔安慰针具



The Streitberger Placebo-needle is indistinguishable from a real acupuncture needle and validated, it is a placebo control for a single-blind randomized clinical trial (RCT) of acupuncture.

*Streitberger K, Kleinhenz J. Introducing a placebo needle into acupuncture research. Lancet 1998; 352: 364-365.*

安慰针具真穴假刺法。1998 年 Lancet 发表使用特殊针具研究报告，其针头为钝形，进针时仅轻刺皮肤表面，但不刺入皮肤，在国外针灸临床中较广泛使用。

# Comparison of pregnancy outcomes (double blind)

## 两组双盲法妊娠率比较

	Real acu	Placebo acu	P-value
Overall pregnancy rate %	43.8 (81/185)	55.1 (102/185)	0.038*
Clinical pregnancy rate %	38.9 (72/185)	49.2 (91/185)	0.059
Ongoing pregnancy rate %	31.9 (59/185)	40.5 (75/185)	0.105
Live birth rate %	29.7 (55/185)	38.4 (71/185)	0.100
Implantation rate %	28.0 (97/347)	32.8 (116/354)	0.189
Miscarriage rate %	32.1 (26/81)	30.4 (31/102)	0.931
Ectopic pregnancy rate %	2.5 (2/81)	1.0 (1/102)	0.585

\* Statistically significant difference. Overall pregnancy rate:



## RESULTS:

The overall pregnancy rate was significantly higher in the placebo acupuncture group than that in the real acupuncture group (55.1 versus 43.8%, respectively,  $P=0.038$ ). No significant differences were found in rates of ongoing pregnancy and live birth between the two groups. Reduction of endometrial and subendometrial vascularity, serum cortisol concentration and the anxiety level were observed following both real and placebo acupuncture, although there were no significant differences in the changes in all these indices between the two groups.

结果：整体受孕率安慰剂针灸组明显高于实际针灸组(分别为55.1和43.8%,  $P = 0.038$ )。但是在持续怀孕和婴儿安全出生率两组之间没有被发现有显著性差异。观察到子宫内膜和子宫内膜下血管、血清皮质醇浓度和焦虑水平实际和安慰剂针灸组均减少, 尽管在两组之间所有这些指标没有显著差异的变化。

# Changes in serum cortisol and prolactin associated with acupuncture during controlled ovarian hyperstimulation in women undergoing in vitro fertilization–embryo transfer treatment

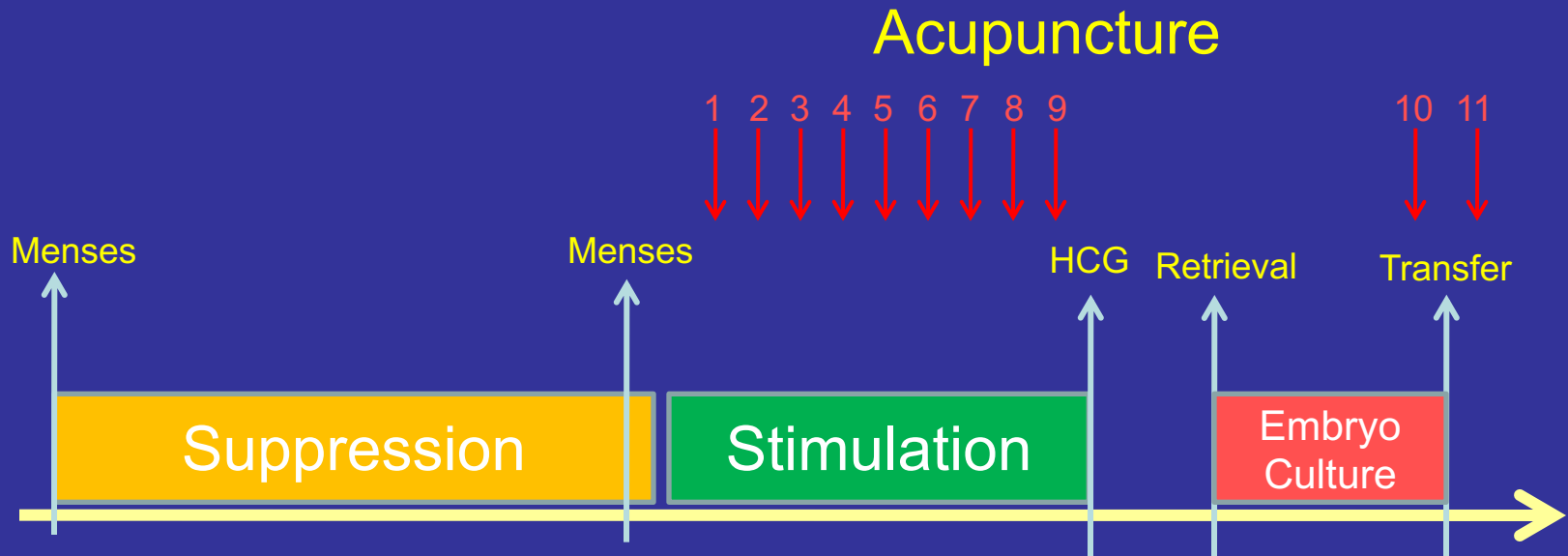
## 女性在IVF超刺激中针灸对于血清皮质醇和催乳素的影响变化

*Fertil Steril.* 2009 Vol 92(6):1870-9.

Paul C. Magarelli, M.D. Diane K. Cridennda, L.Ac. Mel Cohen, Ph.D  
Reproductive Medicine and Fertility Centers, Colorado Springs, Colorado 80910, USA.  
Email: [info@475-baby.com](mailto:info@475-baby.com)

# Magarelli's PROTOCOL PERFORMED FOR ALL E-T

## Magarelli 的针灸治疗方案



**Table1 Demographics of study patients and treatment cycle characteristics.**

	Ac (n = 34)	Control (n = 33)
No. of prior IVF treatments	1.32 ± 0.4 (1–4)	1.44 ± 0.5 (1–4)
Age, years	34.6 ± 3.7 (25–41)	34.7 ± 3.6 (23–40)
Day3 FSH, IU/mL	10.2 ± 1.8 (4–12)	10.1 ± 1.8 (5–14)
BMI, kg/m <sup>2</sup>	32.6 ± 8.5 (18–45)	33.2 ± 8.6 (22–48)
Weight, kg	67.3 ± 18.4 (48–95)	65.5 ± 18.1 (45–100)
E2 on hCG day, pg/mL	3417 ± 104 (2201–5697)	3811 ± 153 (2315–6002)
P4 on hCG day, ng/mL	1.51 ± .21 (1.2–3.9)	1.54 ± .24 (1.2–3.9)
Endometrial thickness on hCG day, mm	10.6 ± 1.1 (7.9–13)	9.4 ± 1.9 (8.1–14)
Oocytes retrieved	13.1 ± 2.2 (6–21)	12.6 + 2.0 (7–20)
Frozen embryos	5.4 ± 0.7 (0–9)	5.2 ± 0.7 (0–8)
Transferred embryos	2.8 ± 0.3 (2–5)	2.9 ± 0.3 (2–5)
Fertilization rate, %	79 ± 8 (66–94)	77 ± 9 (56–88)
Implantation rate, %	18.3	15.6

**Note:** Data are presented as mean ± SD (range). *P* = not significant (NS) for all comparisons (*P*>.05). All patients are IVF patients who underwent IVF medication stimulation, egg retrieval, and ET. N = 67.

**Table 2 Stress hormones: Reproductive outcomes data.**

	Ac (n = 34)	Control (n = 33)	<i>P</i>
Pregnancy rate (+hCG)	18 (53)	14 (41)	<.05
Clinical pregnancy rate (+fetal heart beat [FHB]), %	51	37	<.05
Miscarriages	0 (0)	2 (6)	<.05
Ectopic pregnancies	1 (3)	3 (8)	NS
Birth per pregnancy	17 (94)	9 (64)	<.05
Multiple births	2 (11)	5 (33)	<.05

*Note:* Data are presented as n (%) unless otherwise specified. NS = not significant ( $P > .05$ ). All patients are IVF patients who underwent IVF medication stimulation, egg retrieval, and ET. N = 67.

## Conclusion:

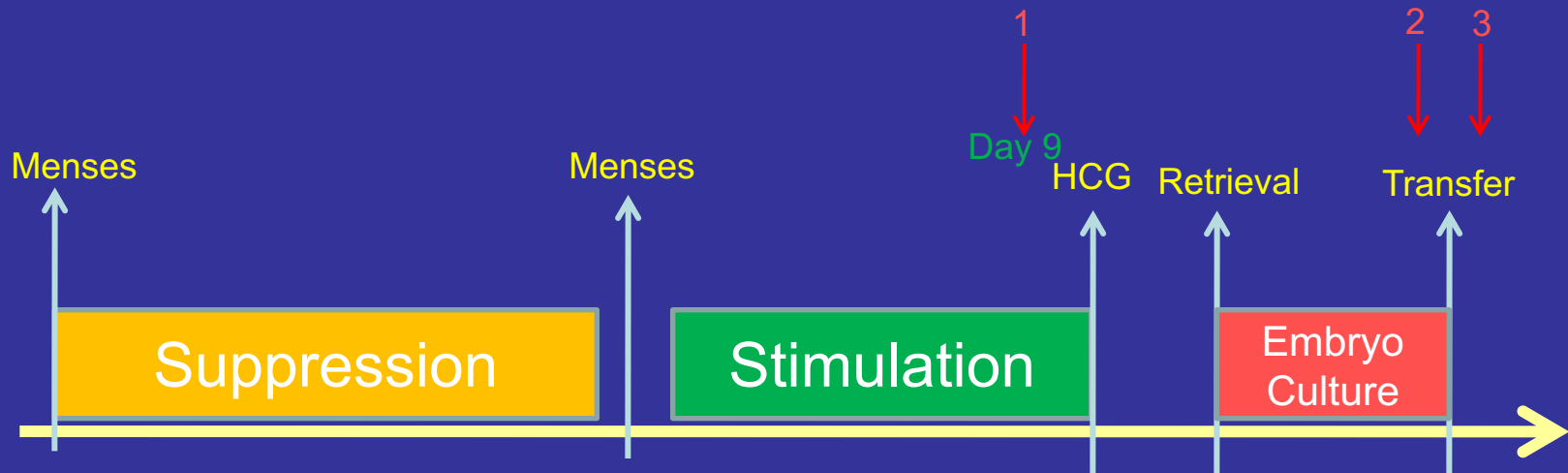
1. This study demonstrates that Acupuncture improve reproductive outcomes in IVF patients.
2. In this study, there appears to be a beneficial regulation of CORT and PRL in the acupuncture group during the medication phase of the IVF treatment with a trend toward more normal fertile cycle dynamics.

## 结论:

1. 本研究显示针灸能改善IVF病人的生殖结果。
2. 在这项研究中, 针灸组在IVF药物治疗过程中, 似乎比正常生殖调控过程中, 有一个更有利于调节皮质醇和催乳素的趋势。

# Smith's PROTOCOL PERFORMED FOR ALL E-T

## Acupuncture



*Fertil Steril.* 2006 May;85(5):1352-8. Epub 2006 Apr 5.

Caroline Smith, Ph.D.,<sup>a</sup> Meaghan Coyle, B.Hlth.Sc. (Acup.),<sup>b</sup> and Robert J. Norman, M.D.<sup>c,d</sup>

### **Influence of acupuncture stimulation on pregnancy rates for women undergoing embryo transfer**

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TABLE 2

Primary and secondary outcomes by group.

Pregnancy outcome	True acupuncture	Noninvasive sham acupuncture	Risk ratio (95% CI)	<i>P</i>
<b>Grading of embryo 1</b>				
Excellent	32 (34)	29 (29)	0.90 (0.40–2.03)	.75
Satisfactory	42 (45)	53 (54)	0.62 (0.30–1.40)	.24
Unsatisfactory	19 (20)	15 (15)	Reference	
<b>Implantation achieved</b> (defined as demonstration of a gestational sac on ultrasound)				
1	29 (78)	25 (80)	Reference	
2	8 (21)	6 (19)	1.15 (0.35–3.80)	.81
<b>Pregnancy achieved</b> (all women) (fetal heart on ultrasound)	34 (31)	27 (23)	1.50 (0.82–2.71)	.18
<b>Pregnancy at 18 weeks</b>	31 (28)	22 (18)		.08

**Conclusion: There was no significant difference in the pregnancy rate between groups; however, a smaller treatment effect can not be excluded.**

结论：两组之间怀孕率没有显著差异；然而不能被排除针灸组有较小的治疗效果。



In many medical specialties it is common to find that several trials have attempted to answer similar questions about clinical effectiveness; for example: **Does the new treatment confer significant benefits compared with the conventional treatment?**

Meta-analysis, a statistical procedure that integrates the results of several independent studies, plays a central role in evidence-based medicine.

荟萃分析（Meta-analysis）是对已发表的和未发表的资料进行综合分析、评价，并用正规的统计学方法综合各研究的结果，是一种对已有的资料进行最佳利用的方法（循证医学）。

<https://class.coursera.org/systematicreview-001/lecture>

# A systematic review and meta-analysis of acupuncture in *in vitro* fertilisation

系统回顾和荟萃分析针灸在试管婴儿中的作用

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# Acupuncture points used in the studies of acupuncture performed around the time of ET

## 针灸穴位在胚胎移植过程中的使用比较

**Table 5.** Acupuncture points used in the studies of acupuncture performed around the time of ET

Author	Acupuncture points														
	PC 6	SP 8	LR 3	GV 20	ST 29	ST 36	SP 6	SP 10	LI 4	CV 3	CV 4	CV 6	LI 14	KI 3	AA
Paulus <i>et al.</i> <sup>26</sup> (2002)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	—	—	—	—	—	Yes
Paulus <i>et al.</i> <sup>27,33</sup> (2003)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	—	—	—	—	—	Yes
Westergaard <i>et al.</i> <sup>28</sup> (2006)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	—	—	—	—	No
Smith <i>et al.</i> <sup>29</sup> (2006)	Yes	Yes	Yes	—	Yes	Yes	Yes	Yes	—	—	—	—	—	—	Yes
Dieterle <i>et al.</i> <sup>30</sup> (2006)	Yes	Yes	Yes	—	Yes	Yes	Yes	Yes	—	—	Yes	Yes	Yes	Yes	Yes
Domar <i>et al.</i> <sup>31</sup> (2006)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	—	—	—	—	—	Yes
Benson <i>et al.</i> <sup>32</sup> (2006)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	Yes
Craig <i>et al.</i> <sup>20</sup> (2007)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	—	—	Yes	—	Yes	Yes

AA, auricular acupuncture; CV, conception vessel; GV, governor vessel; KI, kidney; LI, large intestine; LR, liver; PC, pericardium; SP, spleen; ST, stomach.

PC-6/Neiguan/内关 , SP-8/Diji/地机 , LR-3/Taichong/太冲 , GV-20/Baihui/百会 ,  
ST-29/Guilai/归来 , ST-36/Zusanli/足三里 , SP-6/Sanyinjiao/三阴交 ,  
SP-10/Xuehai/血海 , LI-4/Hegu/合谷 , CV-3/Zhongji/中极 , CV-4/Guanyuan/关元 ,  
CV-6/Qihai/气海 , LI-14/Binao/臂臑 , KI-3/Taixi/太溪

# The acupuncture points used in the studies of acupuncture performed at the time of TVOR

## 针灸穴位在阴道取卵术过程中的使用比较

El-Toukhy *et al.*

**Table 3.** The acupuncture points used in the studies of acupuncture performed at the time of TVOR

Author	Acupuncture points								
	LI 4	TE 5	ST 29	GV 20	ST 36	SP 6	KI 11	LI 10	AA
Stener-Victorin <i>et al.</i> <sup>15</sup> (1999)	Yes	Yes	Yes	Yes	Yes	—	—	—	—
Stener-Victorin <i>et al.</i> <sup>16</sup> (2003)	Yes	Yes	Yes	Yes	Yes	—	—	—	—
Humaidan and Stener-Victorin <sup>17</sup> (2004)	Yes	—	—	Yes	—	Yes	—	—	—
Gejervall <i>et al.</i> <sup>18</sup> (2005)	Yes	—	Yes	Yes	Yes	—	Yes	Yes	—
Sator-Katzenschlager <i>et al.</i> <sup>19</sup> (2006)	—	—	—	—	—	—	—	—	Yes

AA, auricular acupuncture; GV, governor vessel; KI, kidney; LI, large intestine; SP, spleen; ST, stomach; TE, triple energiser.

LI-4/Hegu/合谷, TE-5/Waiguan/外关, ST-29/Guilai/归来, GV-20/Baihui/百会, ST-36/Zusanli/足三里, SP-6/Sanyinjiao/三阴交, KI-11/Henggu/横骨, LI-10/Shaousanli/手三里.

## Main results:

### 主要结果:

1. Meta-analysis of the five studies of acupuncture around the time of egg collection did not show a significant difference in clinical pregnancy (relative risks [RR] = 1.06, 95% CI 0.82–1.37, P = 0.65).

荟萃分析有关针灸在取卵中的五个研究，并没有显示出在临床妊娠方面显著差异。

2. Meta-analysis of the eight studies of acupuncture around the time of ET showed no difference in the clinical pregnancy rate (RR = 1.23, 95% CI 0.96–1.58, P = 0.1).

荟萃分析八个在ET前后针灸治疗的研究，显示在临床怀孕率没有差别。

3. Meta-analysis of these studies did not show a significant increase in live birth rate with acupuncture (RR = 1.34, 95% CI 0.85–2.11).

荟萃分析这些研究结果，并没有显示针灸能显著增加其婴儿安全出生率。

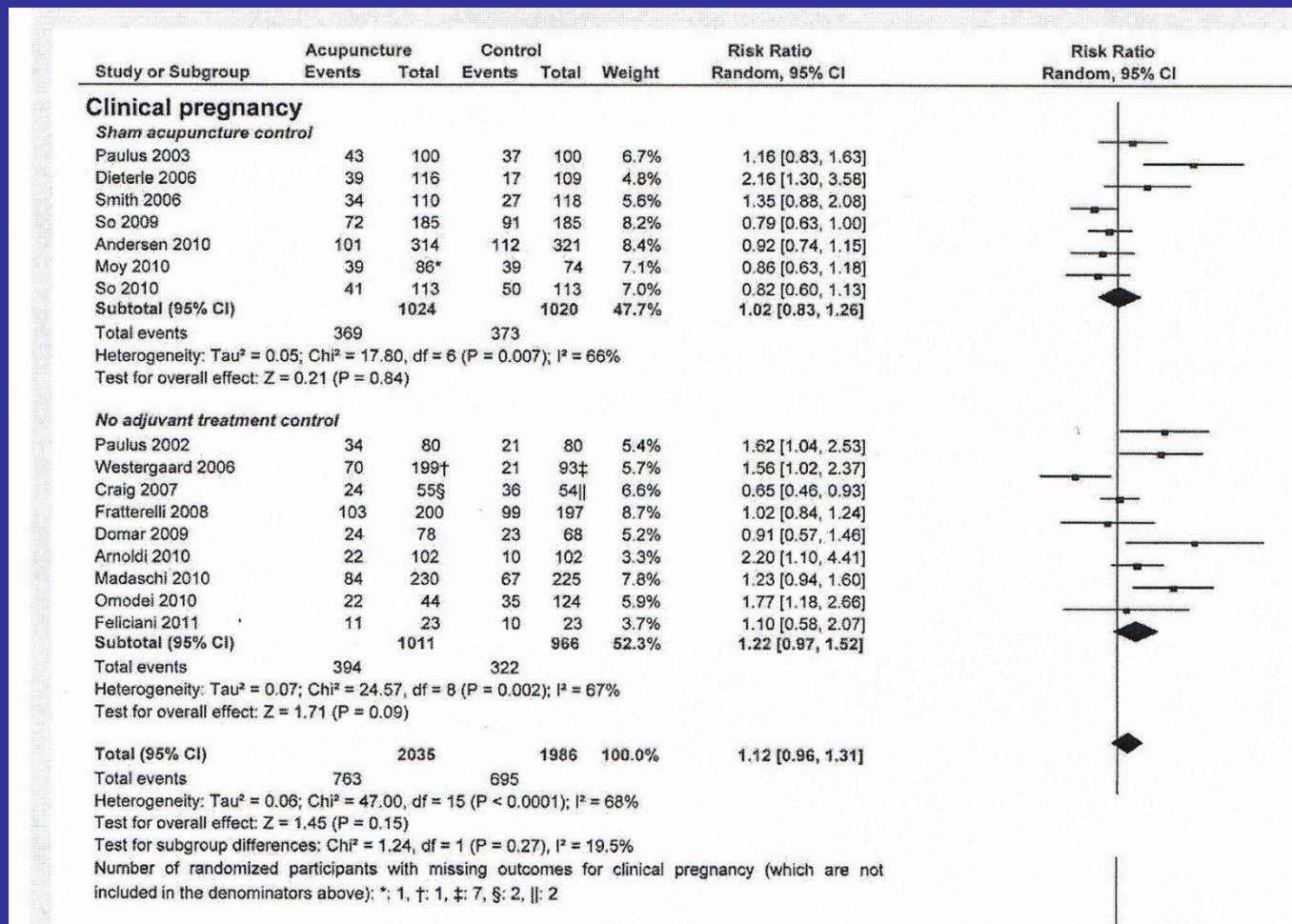
**Conclusion:** Currently available literature does not provide sufficient evidence that adjuvant acupuncture improves IVF clinical pregnancy rate.

**结论：**根据现有文献，并没有提供充分的证据，来表明针灸能辅助提高体外受精的临床受孕率。



# The effects of acupuncture on rates of clinical pregnancy among women undergoing in vitro fertilization: a systematic review and meta-analysis

针灸对女性体外受精临床妊娠率的影响: 系统回顾和荟萃分析



## Ongoing pregnancy

### Sham acupuncture control

Paulus 2003	35	100	26	100	9.3%	1.35 [0.88, 2.06]
Dieterle 2006	33	116	15	109	7.5%	2.07 [1.19, 3.59]
Smith 2006	31	110	22	118	8.4%	1.51 [0.93, 2.44]
So 2009	59	185	75	185	11.7%	0.79 [0.60, 1.03]
So 2010	34	113	44	113	10.2%	0.77 [0.54, 1.11]
Andersen 2010	85	314	102	321	12.1%	0.85 [0.67, 1.09]
<b>Subtotal (95% CI)</b>		<b>938</b>		<b>946</b>	<b>59.2%</b>	<b>1.07 [0.81, 1.42]</b>

Total events 277 284  
 Heterogeneity: Tau<sup>2</sup> = 0.08; Chi<sup>2</sup> = 17.74, df = 5 (P = 0.003); I<sup>2</sup> = 72%  
 Test for overall effect: Z = 0.50 (P = 0.62)

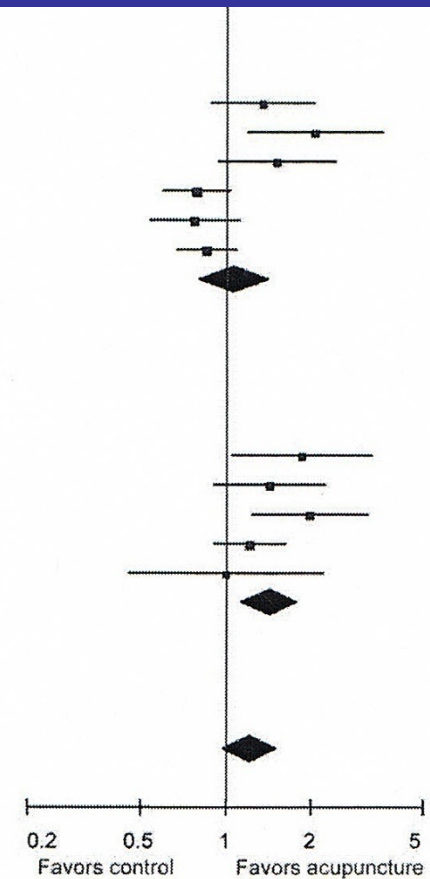
### No adjuvant treatment control

Paulus 2002	26	80	14	80	7.2%	1.86 [1.05, 3.29]
Westergaard 2006	58	199	19	93	8.8%	1.43 [0.90, 2.25]
Omodei 2010	19	44	27	124	8.5%	1.98 [1.23, 3.19]
Madaschi 2010	73	230	59	225	11.4%	1.21 [0.91, 1.62]
Feliciani 2011	8	23	8	23	5.0%	1.00 [0.45, 2.21]
<b>Subtotal (95% CI)</b>		<b>576</b>		<b>545</b>	<b>40.8%</b>	<b>1.43 [1.15, 1.79]</b>

Total events 184 127  
 Heterogeneity: Tau<sup>2</sup> = 0.01; Chi<sup>2</sup> = 4.66, df = 4 (P = 0.32); I<sup>2</sup> = 14%  
 Test for overall effect: Z = 3.19 (P = 0.001)

**Total (95% CI)** 1514 1491 100.0% 1.22 [0.98, 1.52]

Total events 461 411  
 Heterogeneity: Tau<sup>2</sup> = 0.09; Chi<sup>2</sup> = 32.17, df = 10 (P = 0.0004); I<sup>2</sup> = 69%  
 Test for overall effect: Z = 1.79 (P = 0.07)  
 Test for subgroup differences: Chi<sup>2</sup> = 2.51, df = 1 (P = 0.11), I<sup>2</sup> = 60.2%

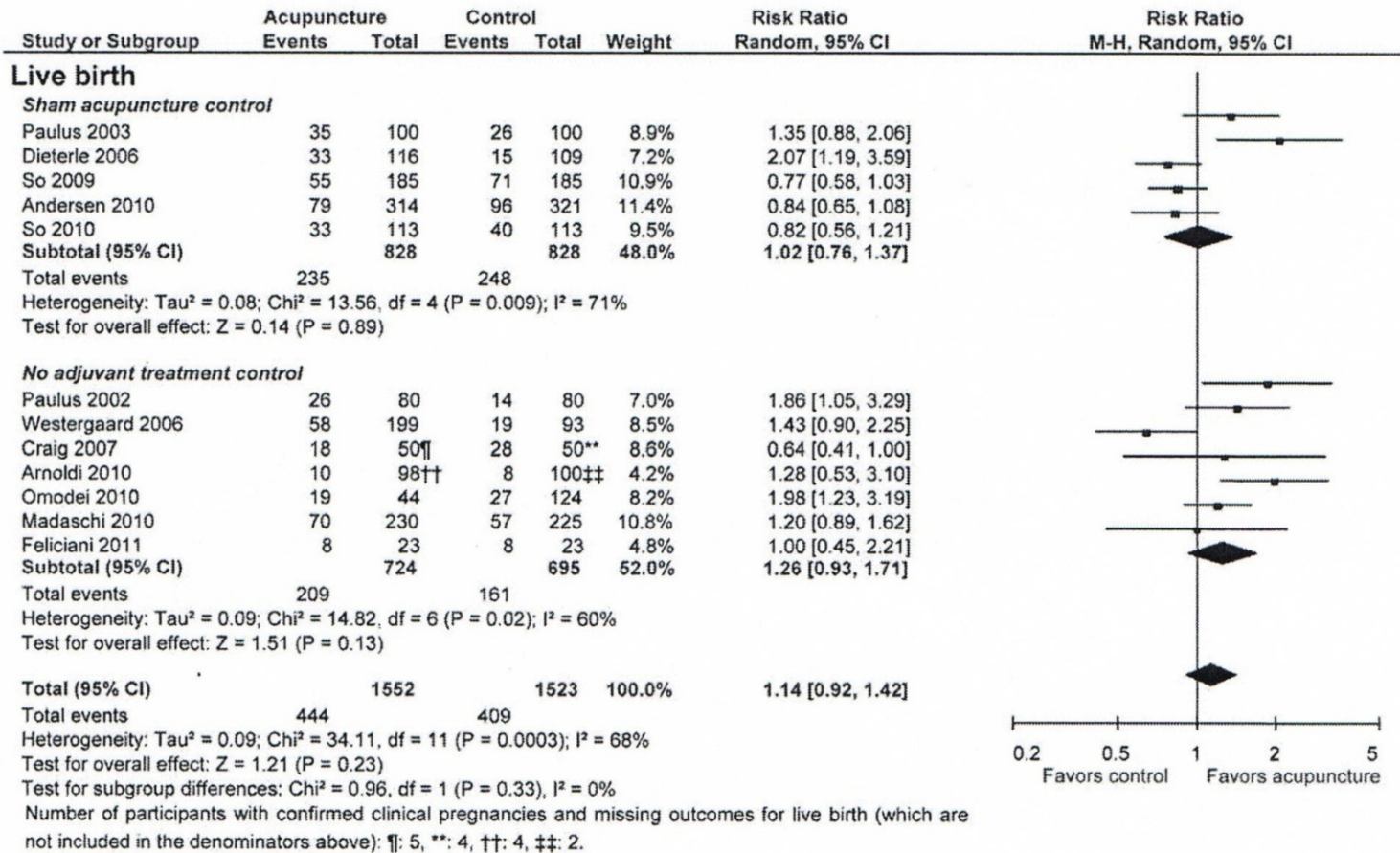


**Figure 1** Effects of acupuncture on clinical pregnancy, ongoing pregnancy and live birth outcomes. The centres of the squares represent estimates from individual trials, the centres of the quadrilaterals represent pooled estimates and the horizontal lines represent 95% CIs.

Eric Manheimer<sup>1,\*</sup>, Danie 'lle van derWindt<sup>2</sup>, Ke Cheng<sup>3</sup>, Kristen Stafford<sup>4</sup>, Jianping Liu<sup>5</sup>, Jayne Tierney<sup>6</sup>, Lixing Lao<sup>1</sup>, Brian M. Berman<sup>1</sup>, Patricia Langenberg<sup>4</sup>, and Lex M. Bouter<sup>7</sup>

<sup>1</sup>Center for Integrative Medicine, University of Maryland School of Medicine, Baltimore, MD 21201, USA <sup>2</sup>Institute for Health and Primary Care Sciences, Keele University, Staffordshire ST5 5BG, UK <sup>3</sup>College of Acupuncture-Moxibustion and Tuina, Shanghai University of TCM, Shanghai Research Center for Acupuncture and Meridians, Shanghai 201203, China <sup>4</sup>Department of Epidemiology and Public Health, University of Maryland School of Medicine, Baltimore, MD 21201, USA <sup>5</sup>Center for Evidence-Based Chinese Medicine, Beijing University of Chinese Medicine, Beijing 100029, China <sup>6</sup>UKMRC Clinical Trials Unit, Meta-Analysis Group, London WC2B6NH, UK <sup>7</sup>Executive Board of the VU University, 1081 HVA msterdam, The Netherlands





**Conclusions:** We found no pooled benefit of adjuvant acupuncture for IVF. The subgroup finding of a benefit in trials with lower, but not higher.

结论:在汇集分析中, 我们没有发现在试管婴儿技术中的有益于针灸的帮助。但在分组分析中发现针灸有一些益处, 而不是很高。

# Acupuncture—help, harm, or placebo?

David R. Meldrum, M.D. et al

Reproductive Partners Medical Group, Redondo Beach, California USA

(Fertil Steril 2013;99:1821–4.)

Much more data that includes a placebo control will be required before a conclusion can be made that acupuncture has a true treatment effect on IVF outcomes. However, unless the timing and method of the acupuncture are standardized, practitioners will still have difficulty being sure that their particular method will help beyond the apparent benefit provided by a placebo.

在得出针灸对IVF的治疗效果真正结论之前，需要更多的数据，包括设立安慰组。然而，除非治疗上时机的选择和针灸方法标准化的确立，否则执业医师仍然有困难和确保他们的特定的操作方法相较于安慰对照组有明显的益处。

“ For current practice, we believe that women should be advised that there is no evidence that receiving acupuncture during IVF treatment improves IVF outcome.”

“在目前的临床中，我们认为应该告知我们的女性患者，还没有证据表明，接受针灸治疗能提高试管婴儿的实际出生率。”

Sesh Kamal Sunkara<sup>1</sup>, Arri Coomarasamy<sup>2</sup>, Yacoub Khalaf<sup>1</sup> and Tarek El-Toukhy<sup>1,3</sup>  
<sup>1</sup>Assisted Conception Unit, Guy's and St Thomas' Hospital NHS Foundation Trust, London, UK

<sup>2</sup>Academic Department, University of Birmingham, Birmingham, UK

<sup>3</sup>Correspondence address. E-mail: tarekeltoukhy@hotmail.com

“Most scientists and physicians agree that this is a controversial area and that more studies are needed before acupuncture is definitely accepted as part of assisted reproduction treatment protocols, such as IVF.”

“大多数科学家们和医生们都同意这是一个充满争议的领域, 在完全接受针灸作为辅助生殖治疗方案例如 IVF 的一部分之前, 需要更进一步的研究。”

By Dr. Daniela Isoyama Manca di Villahermosa, Faculty of Medicine of ABC,  
Clinic for Human Reproduction, Santo André, São Paulo, Brazil

According to more than 60 Chinese papers of acupuncture treatment of infertility for the past ten years, the top frequency used acupuncture points for treatment of infertility were as below table

根据近10年关于针灸治疗排卵障碍性不孕症的60余篇文献报道进行统计，常用穴出现频次依次为：目前针灸在治疗不孕症方面有其独特的优势及发展，其规律主要表现在：主穴多分布在下腹部任脉，配穴根据病变脏腑选取背俞穴及相应经脉上的特定穴。

	Acu point	frequency
1	Ren-4/Guanyuan 关元	93%
2	SP-6/Sanyinjiao 三阴交	91%
3	Uterus/Zigong 子宫	79%
4	REN-3/Zhongji 中极	74%
5	ST-36/Zusanli 足三里	34%
6	UB-23/Shenshu 肾俞	26%



表1 纳入文献的基本情况

编号	研究者	时间(年份)	实验组	对照组	干预组		对照组		RR及其95%CI
					成功妊娠	未成功	成功妊娠	未成功	
1	阿米娜 <sup>[5]</sup>	2011	针灸	克罗米芬	45	21	29	37	1.55(1.13~2.13)
2	郭建芳 <sup>[6]</sup>	2012	针灸	克罗米芬	28	36	16	44	1.64(0.99~2.71)
3	杨继若 <sup>[7]</sup>	2005	针灸	克罗米芬	104	56	36	44	1.44(1.10~1.89)
4	宋丰军 <sup>[8]</sup>	2008	针灸	克罗米芬	40	16	28	26	1.38(1.01~1.87)
5	黄连春 <sup>[9]</sup>	2011	针灸加中药	克罗米芬	11	14	4	21	2.75(1.01~7.48)
6	蔡恒 <sup>[10]</sup>	2004	针灸加中药	克罗米芬	30	26	10	24	1.82(1.02~3.24)
7	林芬 <sup>[11]</sup>	2006	针灸加中药	克罗米芬	20	40	10	50	2.00(1.02~3.91)

表2 异质性检验结果合并RR值及发表偏倚检验

研究	纳入文献数	异质性检验		合并RR及其 95%CI	假设检验		发表偏倚	
		<i>Q</i>	<i>P</i>		<i>Z</i>	<i>P</i>	<i>t</i>	<i>P</i>
针灸组	5	5.01	0.97	1.47(1.27~1.72)	5.01	<0.0001	1.07	0.036
针灸加中药组	3	0.49	0.78	2.03(1.36~3.03)	3.47	0.001	24.69	0.026

The successful pregnant rate of acupuncture group is 1.47 fold of CC only group 95%CI(1.27—1.711). If traditional Chinese medicine added to the acupuncture group the successful pregnant rate is 2.02 fold to CC only group 95%CI (1.42—2.87).

研究通过Meta分析系统性地比较了针灸、针灸加中药与克罗米芬对排卵障碍性不孕的治疗作用合并针灸治疗不孕症共487例(有效278例),其中单纯针灸治疗346例(有效211例)针灸合并中药141例(有效61例)。通过计算比较发现,针灸或针灸加中药治疗不孕症的效果显著优于克罗米芬对照组。单纯针灸与克罗米芬相比RR=1.47, 95%CI(1.27~1.72); 针灸加中药与克罗米芬比RR=2.03, 95%CI(1.36~3.03)。



According to Chinese literatures of the past six years the number of Herbs-frequency analysis, the top five Chinese medicine are Dang Gui, Tu Si Zi, Gou Qi Zi, Shou Di Huang, XianLi Pi. These five kinds of Chinese herbal medicines commonly used in the treatment for infertility due to ovulatory disorder.

在中医用药规律方面,根据近六年文献的药物频数分析,排在前5位的中药是 当归、菟丝子、枸杞子、熟地、仙灵脾、这5种中药材常用于治疗排卵障碍不孕。

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**GUEST EDITORIAL**

## Acupuncture and Pregnancy: Classical Meets Modern

Xiaoxiong Shen, PhD, LAc, and Saadat Bagherigaleh, MD, LAc

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**REVIEWS**

## The Limitation of Randomized Control Trials on the Influence of Acupuncture and *In Vitro* Fertilization: A Literature Review

Yuhsi Wang, LAc, DAOM, Xiaoxiong Shen, PhD, LAc,  
Yue-Fen Hu, LAc, DAOM, and Robyn Soddors, DAOM

· 综 述 ·

# 针刺辅助干预试管婴儿 - 胚胎移植前后的 海外临床进展

沈晓雄

2018年8月第24卷第15期 August.2018 Vol.24 No.15

中医导报

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海外中医

## 中医可以发表阴性结果论文吗?

沈晓雄

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[摘要] 有关中医针灸科研的论文数量近年在不断增加, 阴性结果的论文在海外主流医学杂志上不断出现的情况引发广泛关注。通过分析国际学术界对阴性结果的认可程度及中医针灸在海外研究的现状, 发现国际学术界对阴性结果更加开放和包容。由于中医针灸在海外研究存在特殊性和复杂性, 从业者多为西学中, 且规模以诊所为主, 科研条件不充分, 而中医研究的阴性结果本身也是科研前行路上的探索过程, 严谨科学研究产生的阴性结果对同行研究亦有重要的参考价值, 也避免为了刻意追求阳性结果而进行科研造假。因此, 业界应当认可中医发表阴性结果论文。

## 讨论 Discussion

1. 目前的研究只从狭窄的视角来探讨针灸在IVF-ET前后影响。需要更多的临床数据包括安慰剂，来评估针灸对IVF的治疗是否确实有效，才能得出最后的结论。
1. Current research has only investigated the use of acupuncture in the very narrow window before and after IVF-ET. Much more data that includes a placebo control will be required before a conclusion can be made that acupuncture has a true treatment effect on IVF outcomes.

许多研究表明中药和针灸能改善卵子的质量，以及促进排卵。因此我们应该在这方面多投入临床研究。

. (Zheng Y, Feng X, Mi H, et al. Effects of transcutaneous electrical acupoint stimulation on ovarian reserve of patients with diminished ovarian reserve in in vitro fertilization and embryo transfer cycles. J Obstet Gynaecol Res. 2015 Dec;41(12):1905-11. )

(Wang Y, Li Y, Chen R, et al. Electroacupuncture for reproductive hormone levels in patients with diminished ovarian reserve: a prospective observational study. Acupunct Med. 2016 Oct;34(5):386-391.)

2. Many studies have shown that Chinese herbal medicine and acupuncture can improve the quality of eggs, as well as assist ovulation. Therefore we should do more clinical research in this area.

3. 提前治疗来提高和改善卵母细胞的质量和数量。中医历来重视预防为主。因此，我们认为在试管婴儿治疗前，特别是对于卵巢储备功能低下的病人，鼓励提前三个月前，进行中医和针灸治疗来改善卵子质量。

3. Early treatment to enhance and improve the quality and quantity of oocytes. TCM has been attaching great importance to the prevention. Therefore, we think before IVF treatment three months, especially for patients with diminished ovarian reserve, encouraging them to have Chinese herbal medicine and/or acupuncture treatment to improve the quality of eggs.



2015年中华医学会生殖医学分会发布了最新版规范诊疗标准，

**中药：** 治疗原则是补肾养血、活血化瘀以及疏肝理气，以补肾为主。

补肾中药配合超排卵方案可明显减少Gn用量，提高卵巢反应性，增加卵细胞数量，改善卵子质量，提高妊娠率。补肾活血法对卵巢储备功能低下干预的效应机制为调节生殖激素，抑制卵巢颗粒细胞凋亡，促进卵巢血管生成。

**针灸：** 选取的穴位主要有三组：

第1组，双侧子宫穴、三阴交穴；

第2组，双侧天枢穴、关元穴、中极穴；

第3组，双侧肾俞穴、命门穴、腰阳关穴。

治疗周期为1~3个月经周期。临床数据证明，穴位电刺激可提高窦卵泡的数目，可显著提高胚胎的质量、受精率以及优质胚胎率等。中药配合针灸能够相得益彰，发挥更好的治疗效果。

**中医外治：** 主要有脐灸、督灸及刺络放血疗法。

Reproductive medicine branch of Chinese medical association in 2015 launched the latest version of the diagnosis and treatment standard protocol.

**Herbal medicine principle:** tonifying the Kidney, promoting blood circulation to remove blood stasis, and spreads Liver-Qi.

**Acupuncture treatment** use three groups:

1.Uterus/Zigong子宫, SP-6/Sanyinjiao三阴交

2.ST-25/Tian Shu 天枢, REN-4/Guanyuan关元, REN-3/Zhongji中极

3.UB-23/Shenshu肾俞, DU-4/Mingmen 命门, DU-3/Yaoyangguan 腰阳关

进入超促排卵阶段后适宜针刺的时间窗包括以下几个时间点。

1. 月经第2-3天。针灸可以活血通经，祛瘀生新，形成一个全新的子宫内环境，同时改善卵巢的供血，促进窦卵泡的形成。
2. 月经第9天左右，促进卵子的最后成熟和黄体形成。此时针刺可减少HCG的用量，从而减轻促排卵药物的副作用。
3. 月经的第13-15天，即取卵手术后、胚胎移植前。此时针刺有可能减轻手术的刺激，缓解患者的紧张和压力，调整子宫内环境，改善内膜血供，促进内膜由增生期向分泌期转换，为胚胎移植创造条件。
4. 胚胎移植当天手术前后。此时针刺可降低患者的压力，改善子宫的容受信，控制子宫的收缩活动。
5. 黄体期，移植后2-3天。此时胚胎即将着床，针刺可能有助于维持子宫种植的窗口期，有利于胚胎着床。
6. 着床后第14天平衡激素水平，调畅气血，缓解不安情绪。

It is important and possible to make breakthrough in pregnancy outcome if acupuncture is performed as a suitable time during the IVF-ET.

1. MC day 2-3. Improve blood circulation, promote antral follicles.
2. MC day 9. Stimulate and mature the follicle.
3. MC day 13-15. after retrieval, improve uterine blood circulation.
4. ET day. Improving the uterine receptivity.
5. After ET 2-3 day. Benefit the embryo implantation.
6. After 14 day. Balance the hormone.

# 谢谢!



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