

Embriyo Transferi Teknikleri



Prof. Dr. Levent M. ŞENTÜRK,

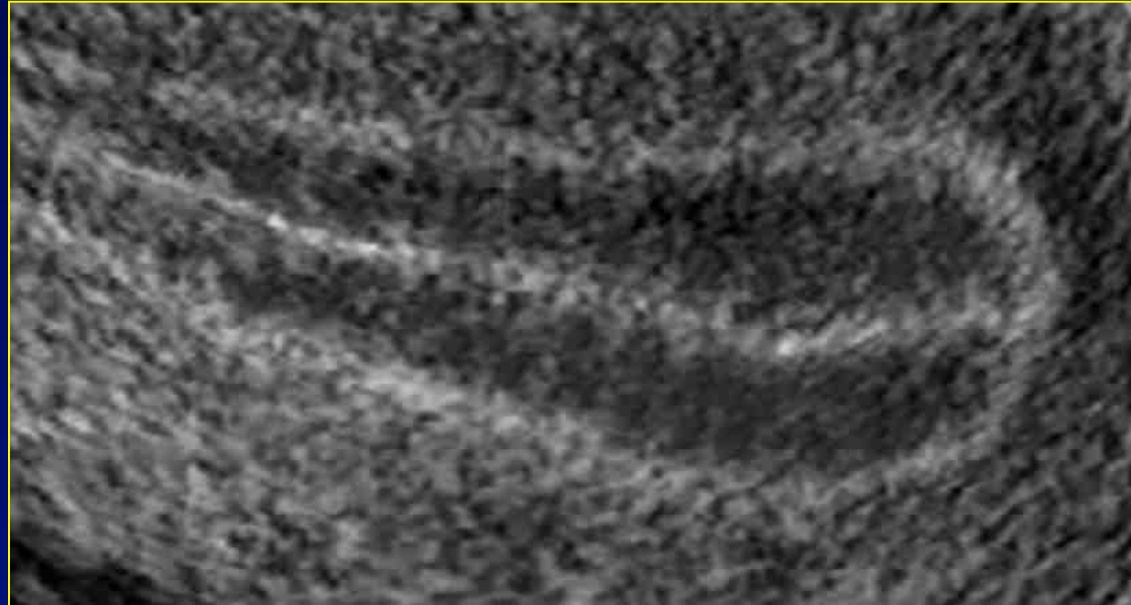
Istanbul Üniversitesi Cerrahpaşa Tıp Fakültesi

Kadın Hastalıkları ve Doğum ABD, Tüp Bebek Bölümü



- **Gelişmelere karşın ART’de implantasyon oranları ve klinik gebelik oranları halen beklenenden düşük**
- **In vitro fertilizasyon ve ICSI uygulamalarında, transfer edilen embriyoların %85’e yakını implante olamamaktadır. (Robert Edwards)**

- **Embriyo transfer tekniğini geliřtirmek**
- **Embriyoların implantasyon kapasitesini artırmak**



Embriyo Transfer Teknikleri

- Deneme (=mock) transferi yapmak
- Transfer öncesi servikal mukusu temizlemek (medyum)
- Tek dişli kullanmamak
- Yumuşak transfer kateterleri kullanmaya çalışmak
- Embriyoları fundusun 2 cm aşağısına bırakmak
- USG eşliğinde embriyo transferi yapmak
- ET sonrası yatak istirahati
- ET yapan kişi
- ...

Embryo transfer - a survey

Salha OH, et al., Human Reprod 16:686-690, 2001

Priority		Mean score ± SD	Total score (%)
1	Standardized protocol for all unit staff	8.5 ± 1.8	679 (85)
2	Absence of bleeding/blood on catheter	7.5 ± 2.6	603 (75)
3	Not touching the fundus	7.2 ± 2.7	572 (72)
4	Type of catheter used	7.2 ± 2.5	568 (71)
5	Avoiding the use of tenaculum	6.1 ± 3.1	484 (61)
6	Removal of all mucus from cervix	6.0 ± 3.2	482 (60)
7	Removal of hydrosalpinges before treatment	5.1 ± 2.7	408 (51)
8	Catheter rotation	4.9 ± 3.6	395 (49)
9	Ultrasound details of cavity before treatment	4.8 ± 3.6	386 (48)
10	Leaving catheter in place for 30 s	4.3 ± 3.1	343 (43)
11	Full bladder for embryo transfer	3.9 ± 3.2	313 (39)
12	Dummy transfer before actual embryo transfer	3.9 ± 3.6	308 (38)
13	Dummy transfer before treatment cycle	3.5 ± 3.1	277 (35)
14	Ultrasonic monitoring of embryo transfer	3.4 ± 3.1	273 (34)
15	No bed rest following embryo transfer	2.9 ± 3.5	233 (29)
16	Bed rest for 5 min following embryo transfer	2.7 ± 2.9	219 (27)
17	Leaving catheter in cavity for 1 min	2.3 ± 2.9	182 (23)
18	Dummy transfer early in treatment cycle	2.2 ± 2.2	173 (22)
19	Anti-prostaglandins to prevent contractions	1.9 ± 1.7	151 (19)
20	Bed rest for >5 min following embryo transfer	1.7 ± 2.2	140 (17)



80
practitioners;

40
Centers

Worldwide survey of IVF practices: trigger, retrieval and embryo transfer techniques **71 ülke, 359 IVF merkezi, 261.300 skl., 2010**

2010; www; anket; 71 ülke; 359 IVF merkezi; 261.300 siklus

- Katılımcıların önemli bir kısmı ET öncesi serviksin dış kısmını (%32 medyumla; %39 steril su ile) temizlemekte, ancak %16 sı mukusu uzaklaştırmak için *internal os'u* temizlemektedir.
- Katılımcıların %64'ü rutin olarak “deneme transferini” tercih etmemekte, bunun yerine katılımcıların büyük çoğunluğu (%77) ET sırasında US kullanmaktadır.

Worldwide survey of IVF practices: trigger, retrieval and embryo transfer techniques **71 ülke, 359 IVF merkezi, 261.300 skl., 2010**

2010; www; anket; 71 ülke; 359 IVF merkezi; 261.300 siklus

- **Katılımcıların %56'sı embriyoları uterus kavitesi ortasına (=internal os ile fundus arası mesafenin ortası), %35'i ise uterus kavitesi üst kısmına (fundus ile uterus kavitesi ortası arasında) bırakmayı tercih etmektedir.**
- **Transfer zorluğuyla karşılaşıldığında, %57 oranında sert ve bükülebilir kateter kullanılmakta, %32 oranında da tek dişliden yardım alınmaktadır. Eğer hastanın daha önceden zor transfer hikayesi biliniyorsa, %47 oranında bir ay önceden serviks dilatasyonu denenmektedir.**

Worldwide survey of IVF practices: trigger, retrieval and embryo transfer techniques **71 ülke, 359 IVF merkezi, 261.300 skl., 2010**

2010; www; anket; 71 ülke; 359 IVF merkezi; 261.300 siklus

- **Katılımcıların %75'si ET sırasında kateteri birkaç saniye bekledikten sonra ve yavaşça geri çekmektedir (%36'sı rotasyon hareketi yaparak, %26'sı rotasyon yapmadan).**
- **Katılımcıların %25'i kateteri hiç beklemeden hızla geri çekerken, %13'ünün de hiç beklemeden ama rotasyon yaparak geri çektiği anlaşılmaktadır.**

Worldwide survey of IVF practices: trigger, retrieval and embryo transfer techniques **71 ülke, 359 IVF merkezi, 261.300 skl., 2010**

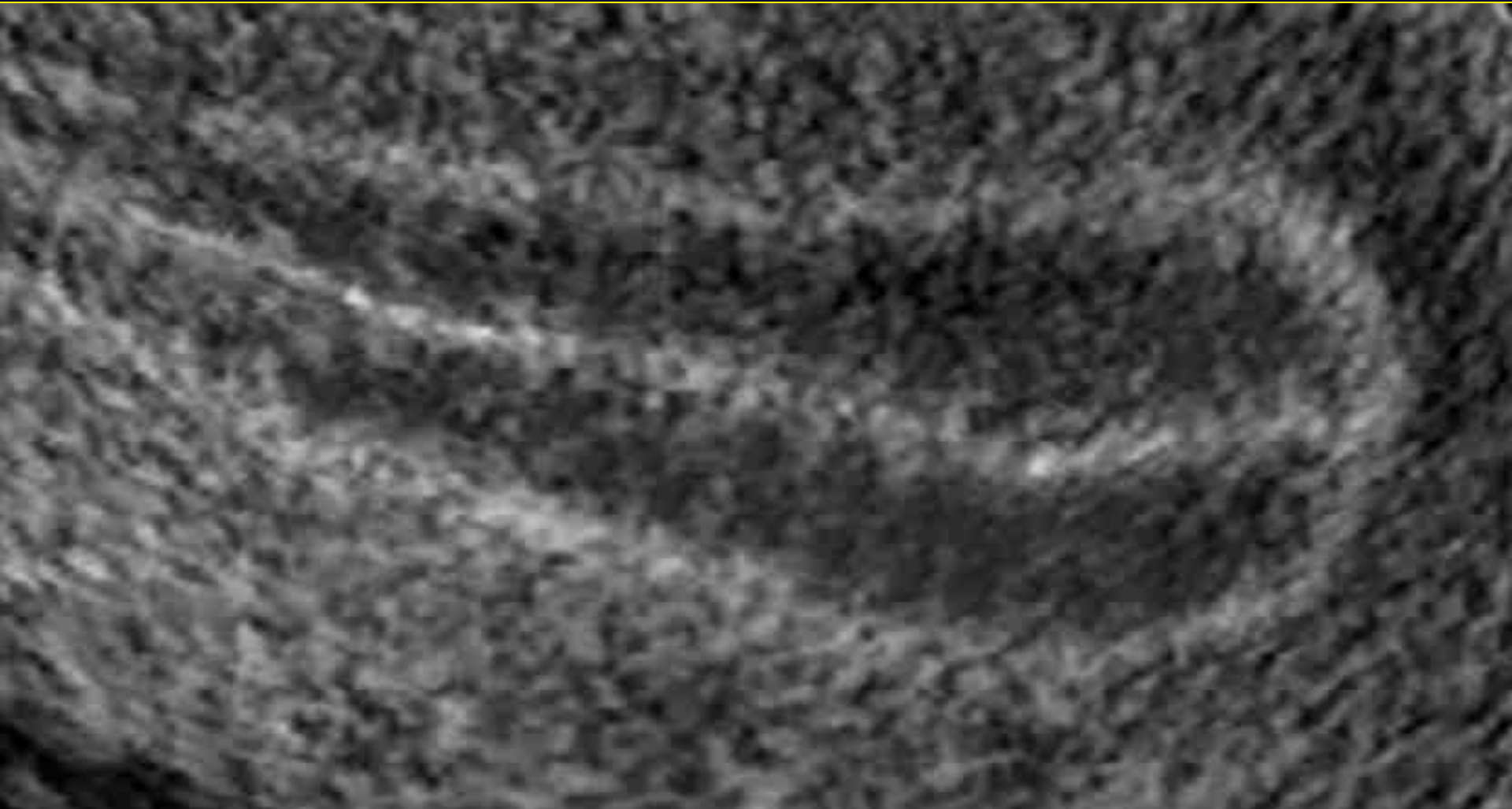
2010; www; anket; 71 ülke; 359 IVF merkezi; 261.300 siklus
Katılımcıların

- %42'si ET sonrası hiç beklemeden hastayı kaldırırken,
- %31'i 30dk ya da daha az,
- %24'ü 1-2 saat arası,
- çok azı da 2 saatten uzun süre (sırt üstü olarak) yatakta yatmaktadır.

Katılımcıların

- %32'si hiçbir hareket kısıtlaması yapmazken,
- %27'si ET günü,
- %30'u bir kaç gün,
- %11'i ise gebelik testi yapılana kadar hareket kısıtlamasını önermektedir.

USG-guided ET



USG-guided ET

- **Ultrasound-guided embryo transfer was first described by Strickler *et al.* in 1985**
- **16 abdominal ultrasound-guided transfers vs 12 transfers guided by ‘clinical feel’**
- **Ultrasound-guided transfers were easier and there was less catheter distortion.**

USG-guided ET



They have concluded that, with ultrasound guidance,

- transfers can be done with the patient supine in the lithotomy position**
- the catheter tip can be accurately positioned in the fundus of the uterine cavity**
- the ejection of the transfer bubble into the uterus can be documented**
- the observation of the bubble is comforting to the patient**

USG-guided ET

Ultrasonographic guidance has many potential advantages:

- It facilitates placement of **soft** catheters
- Avoids touching the **fundus**
- Confirms that the catheter is beyond the internal os in cases of an **elongated cervical canal**
- Allows direction of the catheter along the contour of the endometrial cavity, thereby avoiding disruption of the endometrium, plugging of the catheter tip with endometrium, and instigation of **bleeding**.

USG-guided ET

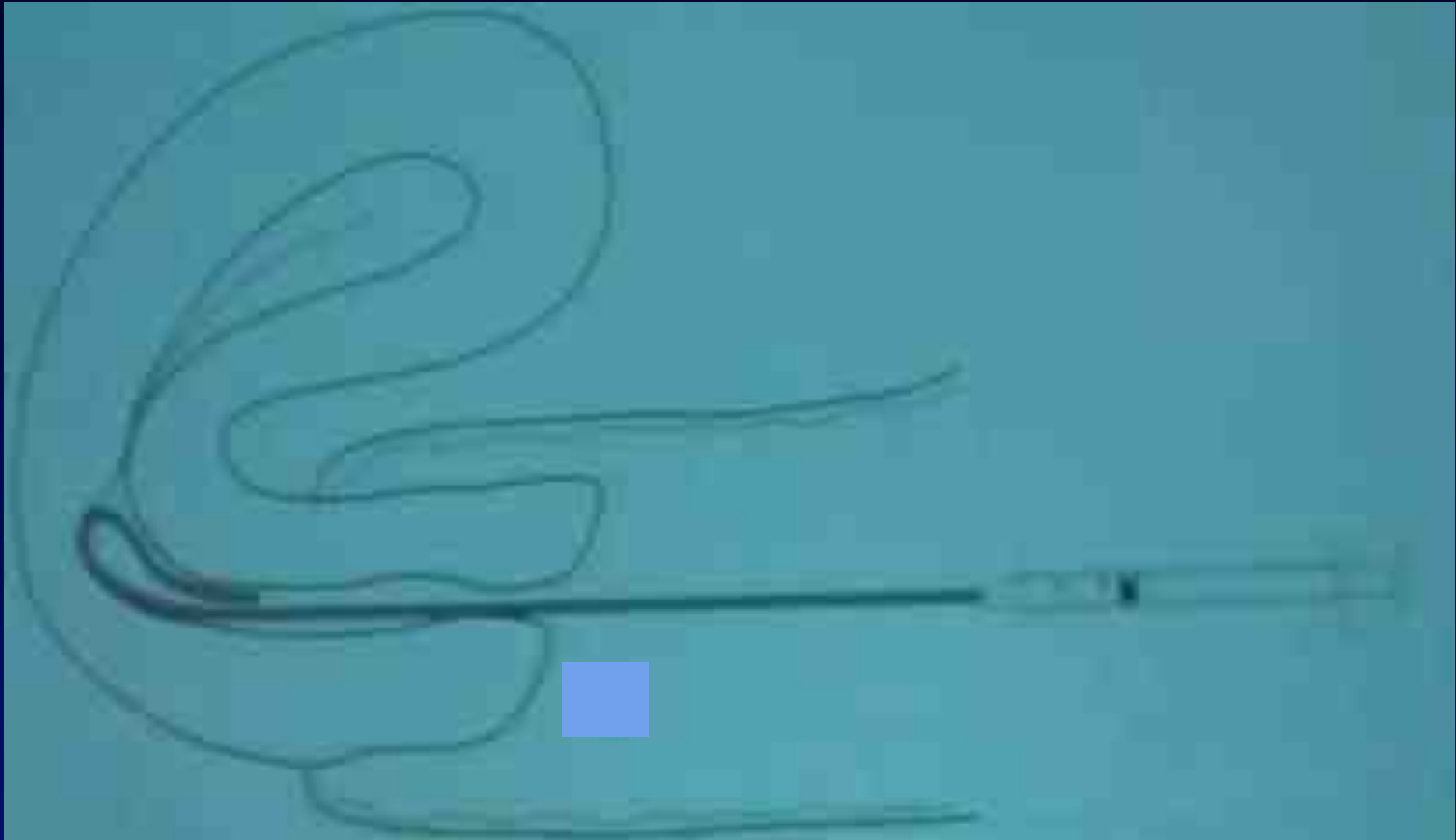
Ultrasonographic guidance has ancillary advantages:

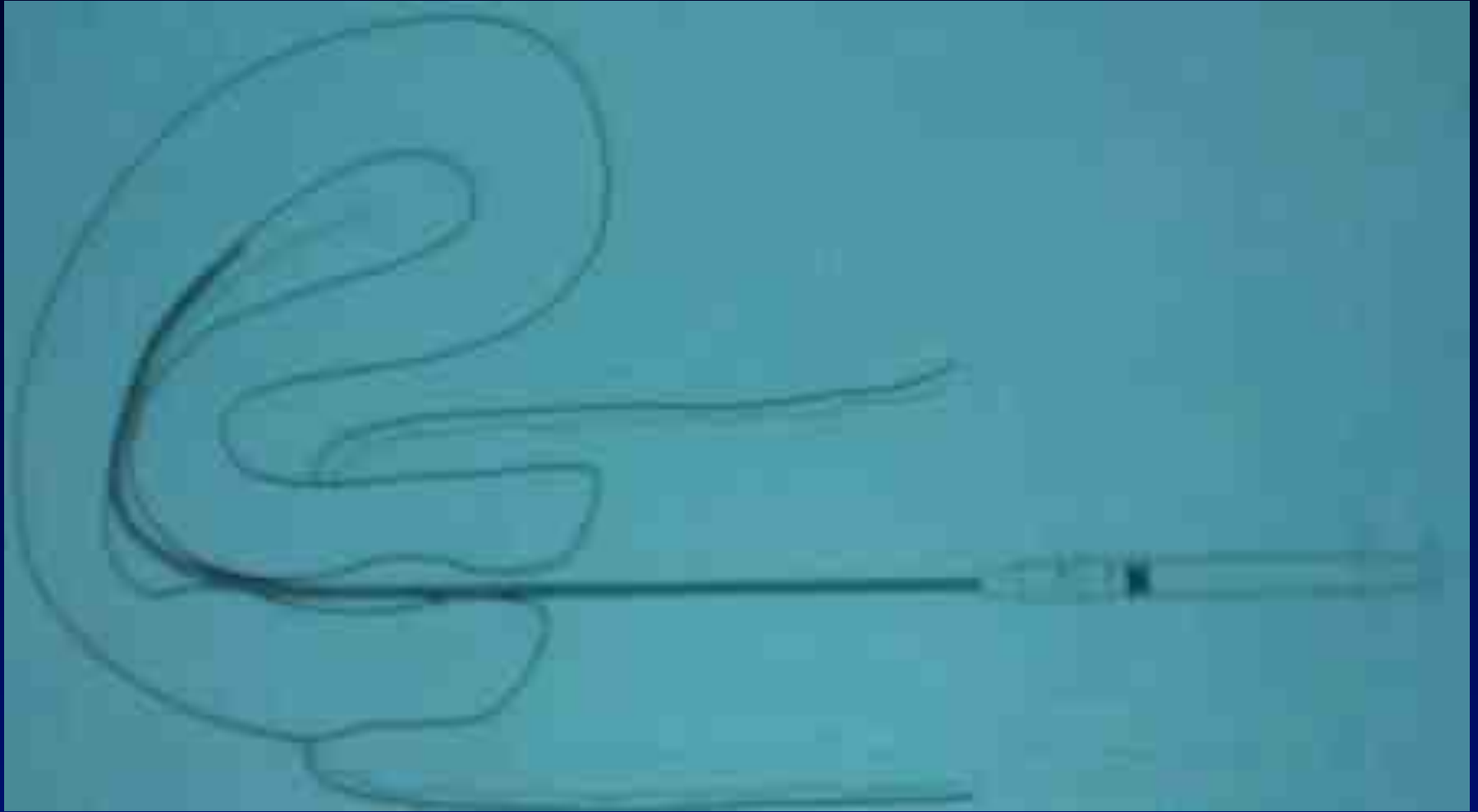
- Assessment of the **ovaries**
- Presence of excessive peritoneal fluid volume to confirm that the risk for **OHSS** is not so great as to preclude embryo transfer
- **Fluid in the endometrial cavity** can also be ruled out
- The **full bladder** required to perform transabdominal ultrasonographic guidance is itself helpful in straightening the cervical uterine access and improving pregnancy rates

Hofmann GE, Warikko P, Jacobs W. Ultrasound detection of pyometra at the time of embryo transfer after ovum retrieval for in vitro fertilization. *Fertil Steril* 2003; 80: 637–8.

Griffiths AN, Watermeyer SR, Klentzeris LD. Fluid within the endometrial cavity in an IVF cycle—a novel approach to its management. *J Assist Reprod Genet* 2002; 19: 298–301.







Studies on USG-guided ET

• Strickler, et al	1985	CCT
• Leong, et al	1986	CCT
• Hurley, et al	1991	QRT
• Al-Shawaf, et al	1993	CCT
• Prapas, et al	1995	QRT
• Kan, et al	1999	QRT
• Lindheim, et al	1999	CCT
• Wood, et al	2000	CCT
• Coroleu, et al	2000	RCT
• Prapas, et al	2001	QRT
• Tang, et al	2001	RCT
• Sallam, et al	2002	QRT
• Garcia-Velasco	2002	RCT
• Matorras, et al	2002	RCT

USG-guided ET meta-analysis

Ultrasound-guided embryo transfer: a meta-analysis of randomized controlled trials

Fertil Steril 80:1042-6, 2003

Hassan N. Sallam, M.D., Ph.D., F.R.C.O.G., and Sameh S. Sadek, M.D.

Department of Obstetrics and Gynaecology, Alexandria University, Alexandria, Egypt

USG-guided ET meta-analysis

A meta-analysis of ultrasound-guided versus clinical touch embryo transfer

Fertil Steril 80:1037-41, 2003

William M. Buckett, M.D.

Department of Obstetrics and Gynecology, McGill University, Royal Victoria Hospital, Montréal, Québec, Canada

USG-guided ET *meta-analysis*

Sallam HN, Sadeck SS, *Fertil Steril* 80: 1042-6, 2003

a meta-analysis of randomized controlled trials comparing the use of ultrasound guidance during embryo transfer to the “clinical touch method”

USG-guided ET *meta-analysis*

Sallam HN, Sadeck SS, *Fertil Steril* 80: 1042-6, 2003

Inclusion criteria

- **Randomization by computer tables or similar**
- **Intervention and study groups similar**
- **Intention to treat analysis**
- **Follow-up complete**

- **Key words: embryo transfer, ultrasound, RCT, ICV, ICSI**

Studies on USG-guided ET

• Strickler, et al	1985	CCT
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• Prapas, et al	2001	QRT
• Tang, et al	2001	RCT
• Sallam, et al	2002	QRT
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USG-guided ET *meta-analysis*

Sallam HN, Sadeck SS, *Fertil Steril* 80: 1042-6, 2003

Statistical analysis

- RevMan® software
- With the Peto-modified Mantel-Haenszel method

USG-guided ET *meta-analysis*

Sallam HN, Sadeck SS, *Fertil Steril* 80: 1042-6, 2003

Outcome measures

Primary

- Clinical pregnancy rate (CPR)
- Implantation rate (IR)
- Ongoing pregnancy rate (OPR; >10GW)

Secondary

- Ectopic pregnancy rate
- Multiple pregnancy rate
- Miscarriage rate
- Incidence of difficult transfers

USG-guided ET *meta-analysis*

Sallam HN, Sadeck SS, *Fertil Steril* 80: 1042-6, 2003

Sensitivity analysis

- Effect of number of embryos transferred
(1, 2 or 3)

USG-guided ET *meta-analysis*

Sallam HN, Sadeck SS, *Fertil Steril* 80: 1042-6, 2003

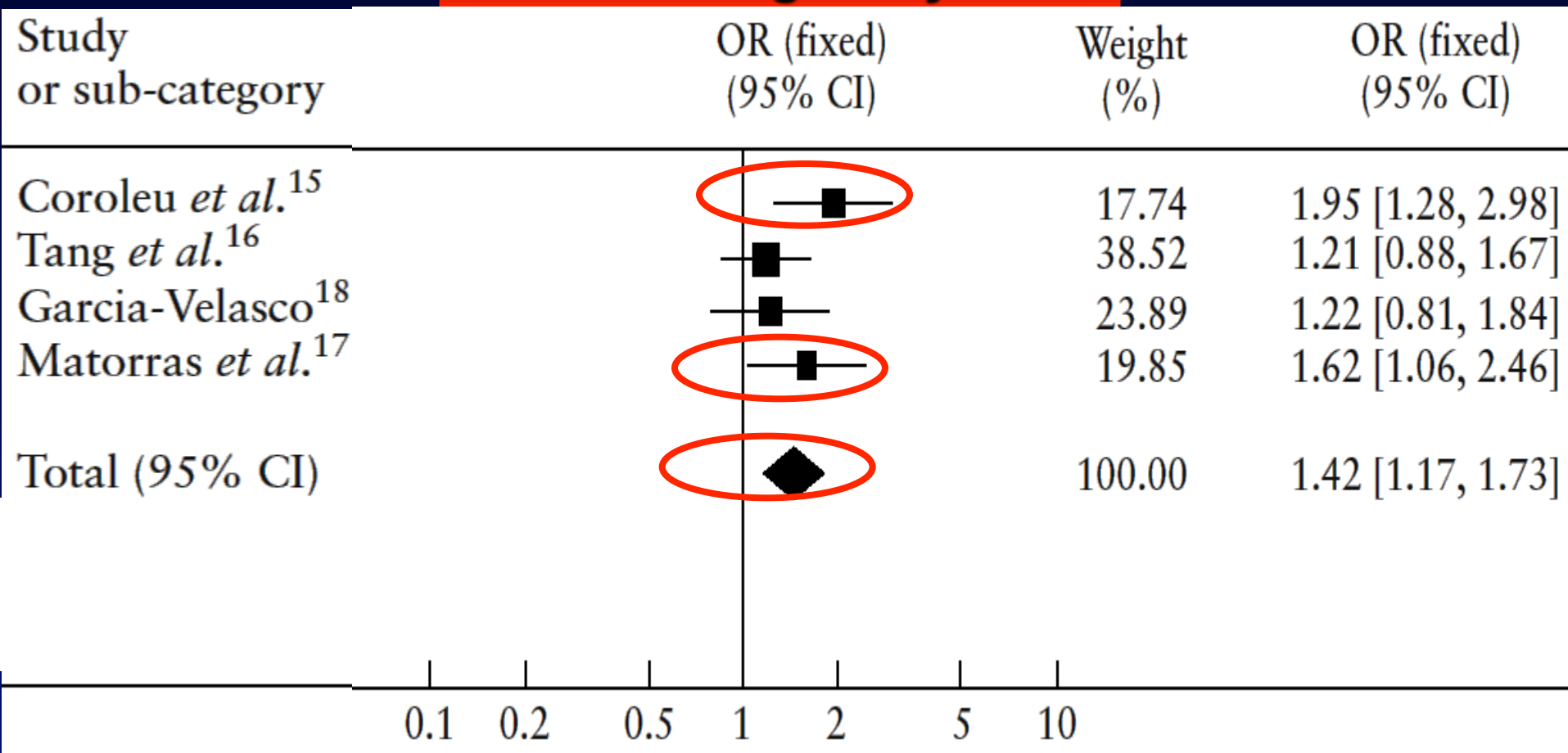
Power analysis

- In order to reach statistical significance, the minimum number of patients included in the meta-analysis should be **786 in each arm** of the study
- In order to improve the clinical pregnancy rate from 23% to 30%, accepting a 90% probability of finding a true difference and taking 5% as the significance level
- **Four studies** conformed the strict selection criteria and the total numbers included were **1,024** and **1,027** patients in each arm of the analysis.

USG-guided ET *meta-analysis*

Sallam HN, Sadeck SS, *Fertil Steril* 80: 1042-6, 2003

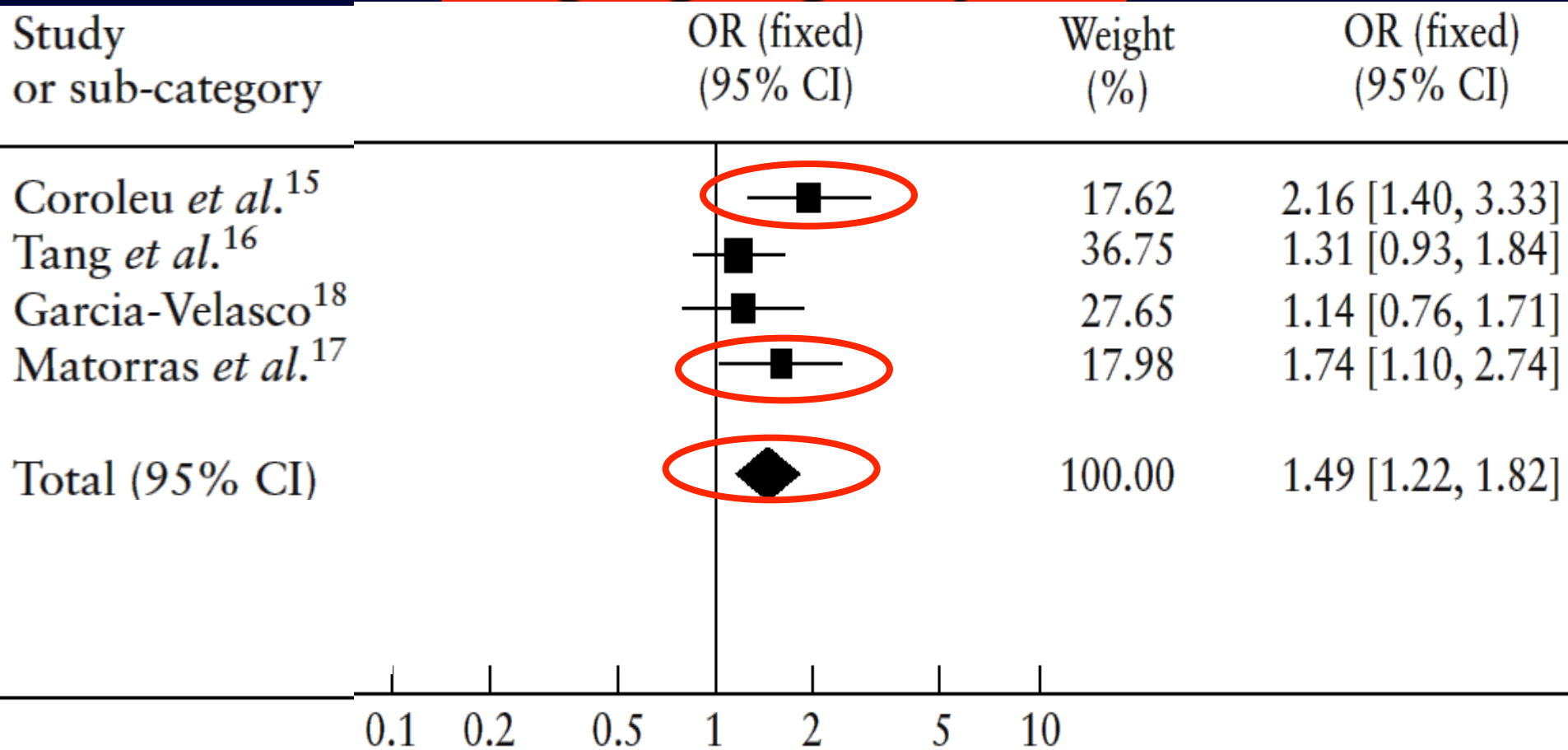
Clinical Pregnancy Rate



USG-guided ET *meta-analysis*

Sallam HN, Sadeck SS, *Fertil Steril* 80: 1042-6, 2003

On-going Pregnancy Rate

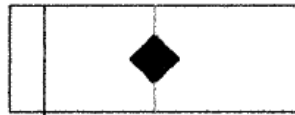


USG-guided ET *meta-analysis*

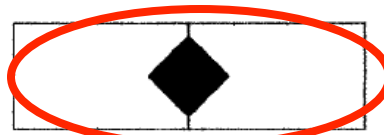
Buckett WM, *Fertil Steril* 80: 1037-41, 2003

Implantation Rate

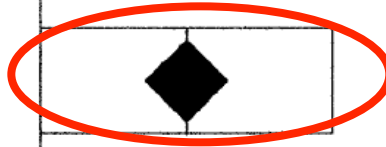
Garcia-Velasco
et al. 2002



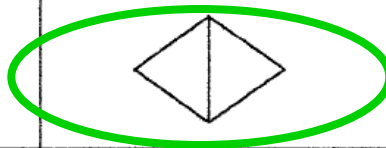
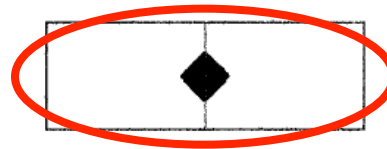
Matorras *et al.*
2002



Tang *et al.*
2001



Coroleu *et al.*
2000



0.5 1 2 5

MH pooled odds ratio = 1.39 (95% CI 1.20 to 1.60)

USG-guided ET *meta-analysis*

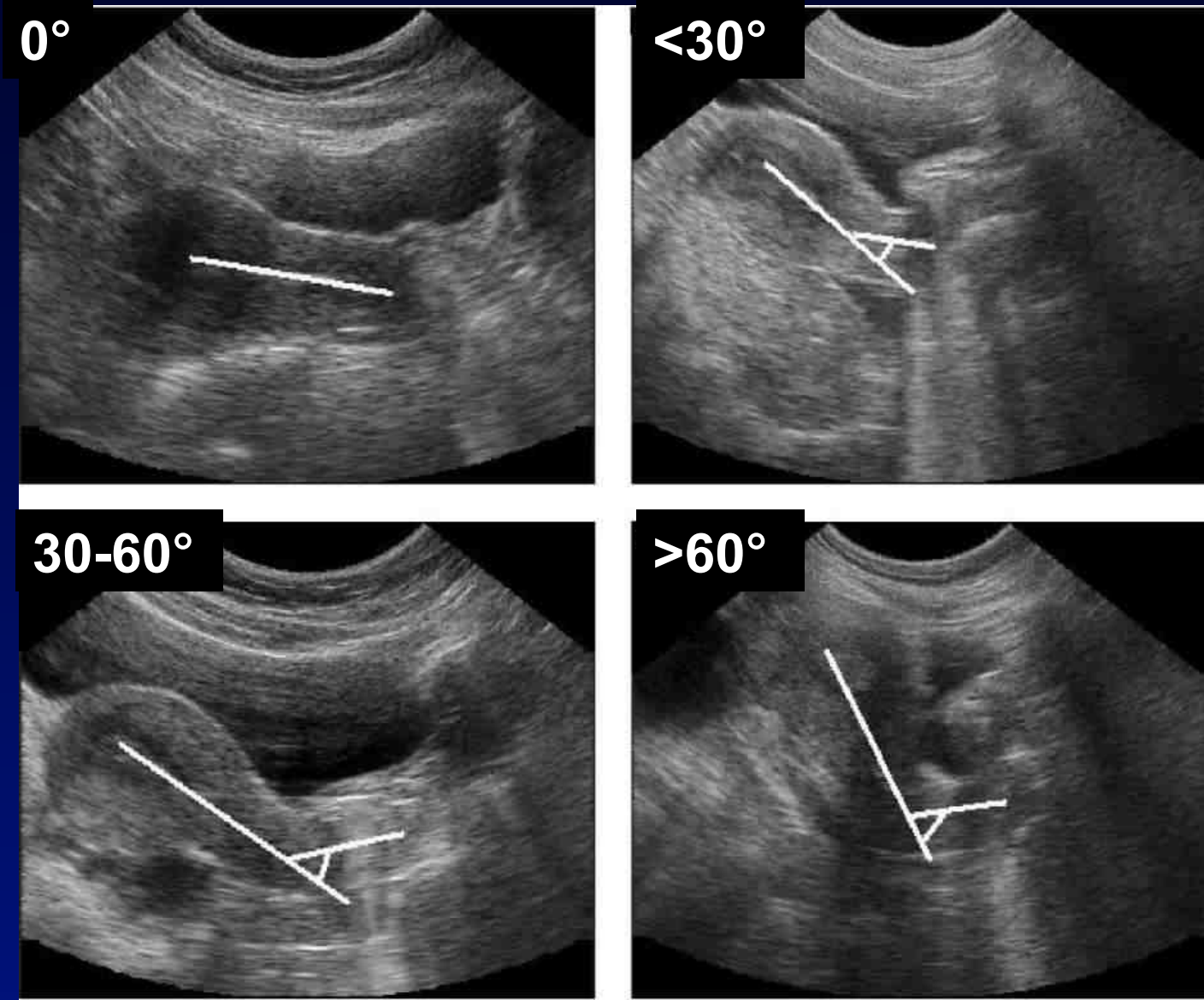
Sallam HN, Sadeck SS, *Fertil Steril* 80: 1042-6, 2003

	USG (+) (n=1024)		USG (-) (n=1027)		p	OR	CI
	n	%	n	%			
Ectopic Pregnancy	5/449	1.1	11/385	2.9	NS	0.39	0.14-1.10
Multiple Pregnancy	77/283	27.2	57/240	23.8	NS	1.18	0.79-1.79
Miscarriage Rate	30/283	10.6	29/240	12.1	NS	0.83	0.48-1.44
Difficult transfer	76/837	9.1	127/840	15.1	<0.0001*	0.55	0.41-0.75
≥3 ET Pregnancy Rate	88/221	39.8	70/236	29.7	<0.05	1.63	1.09-2.43

* The test (Breslow-Day) for homogeneity of the studies showed that this result cannot be accepted !!!

Measuring uterocervical angle before ET

Sallam, et al *Human Reprod* 17: 1767, 2002



Measuring uterocervical angle before ET

Sallam, et al *Human Reprod* 17: 1767, 2002

Distribution of uterocervical angle and clinical pregnancy rate (CPR) in the ultrasound-guided embryo transfer group ($n = 320$)

Angle size (°)	<i>n</i> (%)	Pregnancies (<i>n</i>)	CPR (%)
No angle	39 (12.2)	14	35.9
Small (<30)	32 (10)	11	34.4
Moderate (30–60)	119 (37.2)	37	31.1
Large (>60)	130 (40.6)	22	16.9 ^a
Total	320 (100)	84	26.3



^aStatistically significantly different from patients with no angle ($P < 0.02$).

Embryo transfer depth

Coroleu, *et al*, 2002

Coroleu B, Barri PN, Carreras O, Martinez F, Parriego M, Hereter L, Parera N, Veiga A, Balasch J.

The influence of the depth of embryo replacement into the uterine cavity on implantation rates after IVF: a controlled, ultrasound-guided study.

Hum Reprod 2002; 17: 341–346

- Depositing the embryos **2 cm below the uterine fundus** resulted in significantly higher pregnancy rates compared with depositing them **nearer to the fundus (i.e. 1 cm)**; *n=180; RCT*

Influence of embryo transfer depth on in vitro fertilization and embryo transfer outcomes

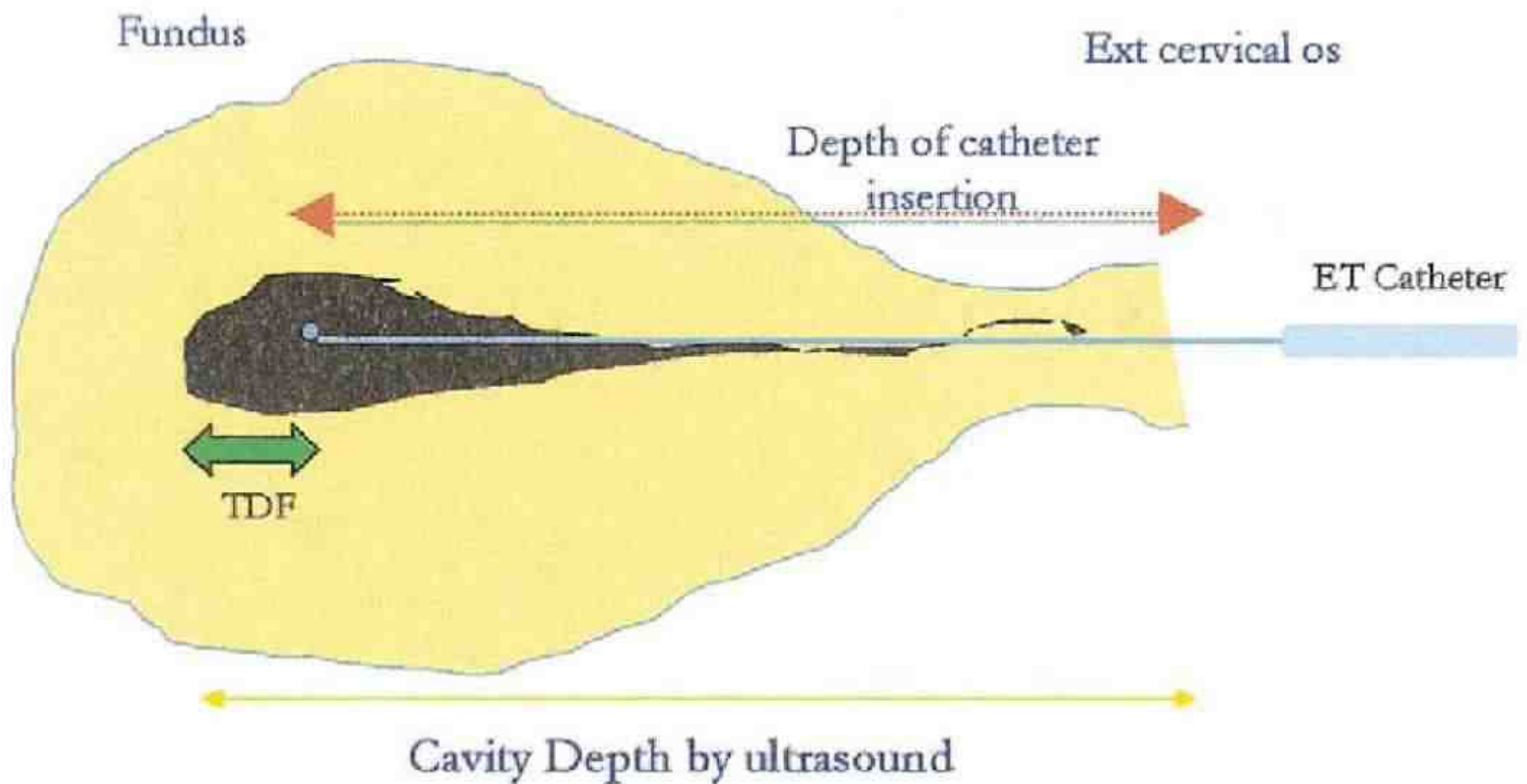
Fertil Steril 81: 51-8, 2004

Christian S. Pope, D.O.,^a Elizabeth K. D. Cook, M.S.,^b Margaret Arny, Ph.D.,^c Amy Novak, RDDS,^d and Daniel R. Grow, M.D.^d

Baystate Medical Center, Springfield, and Western Campus, Tufts University School of Medicine, Medford, Massachusetts

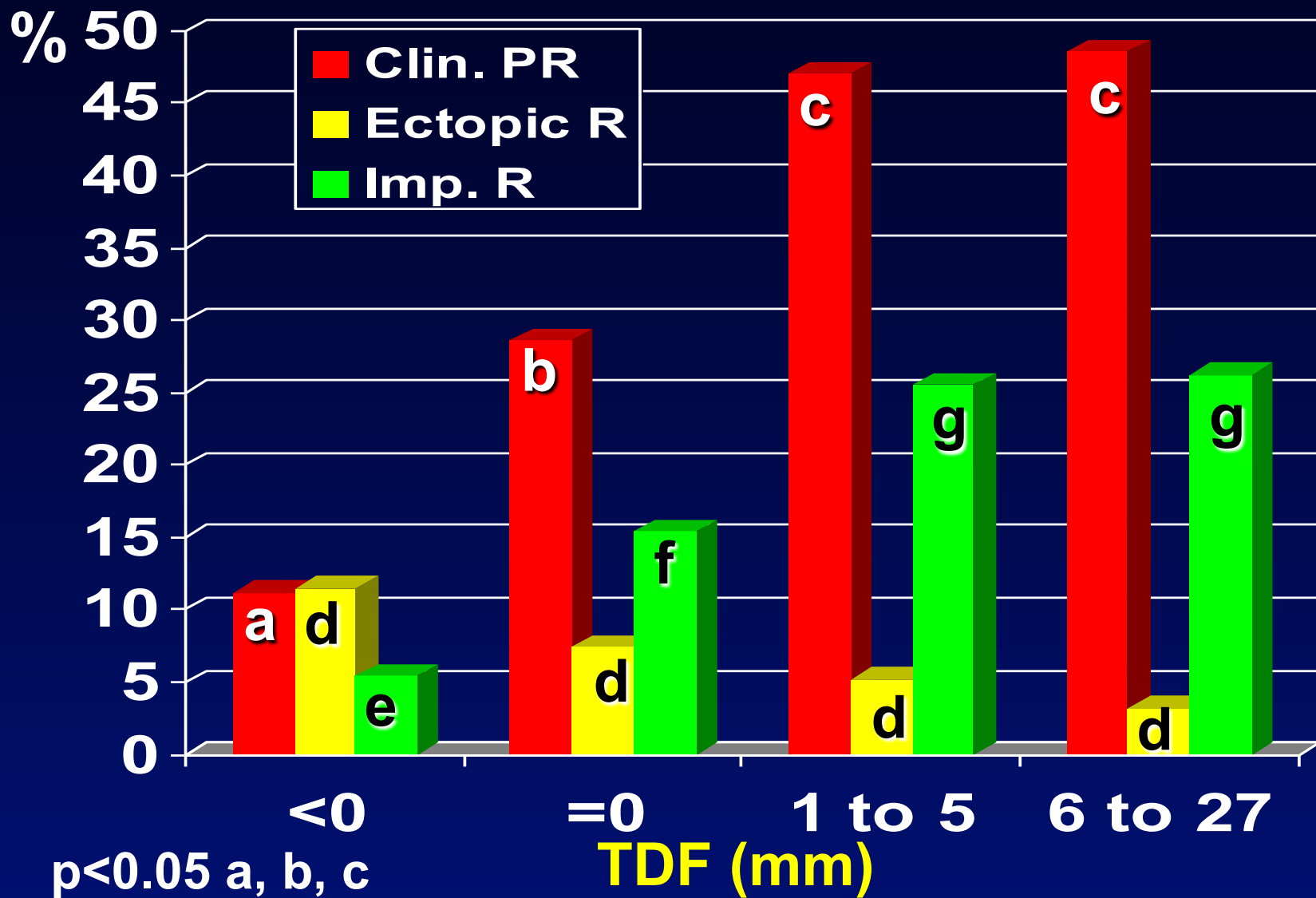
Objective: To investigate the influence of transfer distance from the fundus (TDF) on clinical pregnancy rate (PR) and ectopic pregnancy rate.

N=699, retrospective cohort



Transfer Distance from Fundus (TDF) =

cavity depth by ultrasound - depth of catheter insertion



Influence of embryo transfer depth on in vitro fertilization and embryo transfer outcomes

Fertil Steril 81: 51-8, 2004

Christian S. Pope, D.O.,^a Elizabeth K. D. Cook, M.S.,^b Margaret Arny, Ph.D.,^c Amy Novak, RDDS,^d and Daniel R. Grow, M.D.^d

Baystate Medical Center, Springfield, and Western Campus, Tufts University School of Medicine, Medford, Massachusetts

Increasing the TDF by US resulted in significantly increased PR as well as lower ectopic rates.

Using regression analysis, the odds ratio for TDF by US was 1.11 (95% CI: 1.07–1.14)

This suggests that for every additional millimeter embryos are deposited away from the fundus, the odds of clinical pregnancy increased by 11%

Middle to lower uterine segment embryo transfer improves implantation and pregnancy rates compared with fundal embryo transfer

Fertil Steril 81: 1273-7, 2004

David Frankfurter, M.D., James B. Trimarchi, Ph.D., Celso P. Silva, M.D., and David L. Keefe, M.D.

Women and Infants' Hospital of Rhode Island, Brown Medical School Division of Biology and Medicine, Providence, Rhode Island

- **Prospective cohort study.**
- **A total of 393 fundal and**
- **273 lower to middle uterine segment ETs were performed**

Characteristic	Fundal (n = 393)	Lower-mid (n = 273)	<i>P</i> value
Live births (% of ET) ^a	103 (26.2)	93 (34.1)	.03
Clinical pregnancies (% of ET) ^a	123 (31.2)	115 (39.6)	.005
Implantations (sacs/embryos trans) ^a	192 (0.141)	174 (0.206)	.001

Conclusion(s):

- Both PR and implantation rates are favorably affected by directing embryo placement to the lower to middle uterine segment.
- By some unknown mechanism, it appears that this endometrial location provides a more favorable region for embryo deposition

A prospective randomized comparison of the Wallace catheter and the Cook Echo-Tip[®] catheter for ultrasound-guided embryo transfer

Fertil Steril 77: 826-30, 2002

Vishvanath Karande, M.D., David Hazlett, Ph.D., Mary Vietzke, R.N., and Norbert Gleicher, M.D.

Center for Human Reproduction and the Foundation for Reproductive Medicine, Chicago, Illinois

Objectives: To compare the performance of a new coaxial catheter system with an echo-dense tip (Cook Echo-Tip[®] catheter) with a Wallace catheter during ultrasound-guided ET.

Design: Prospective, randomized study

n=251

Conclusion:

The Cook Echo-Tip catheter with its echogenic tip **simplifies ultrasound-guided ET, but pregnancy success rates are similar** to those obtained when a Wallace catheter is used

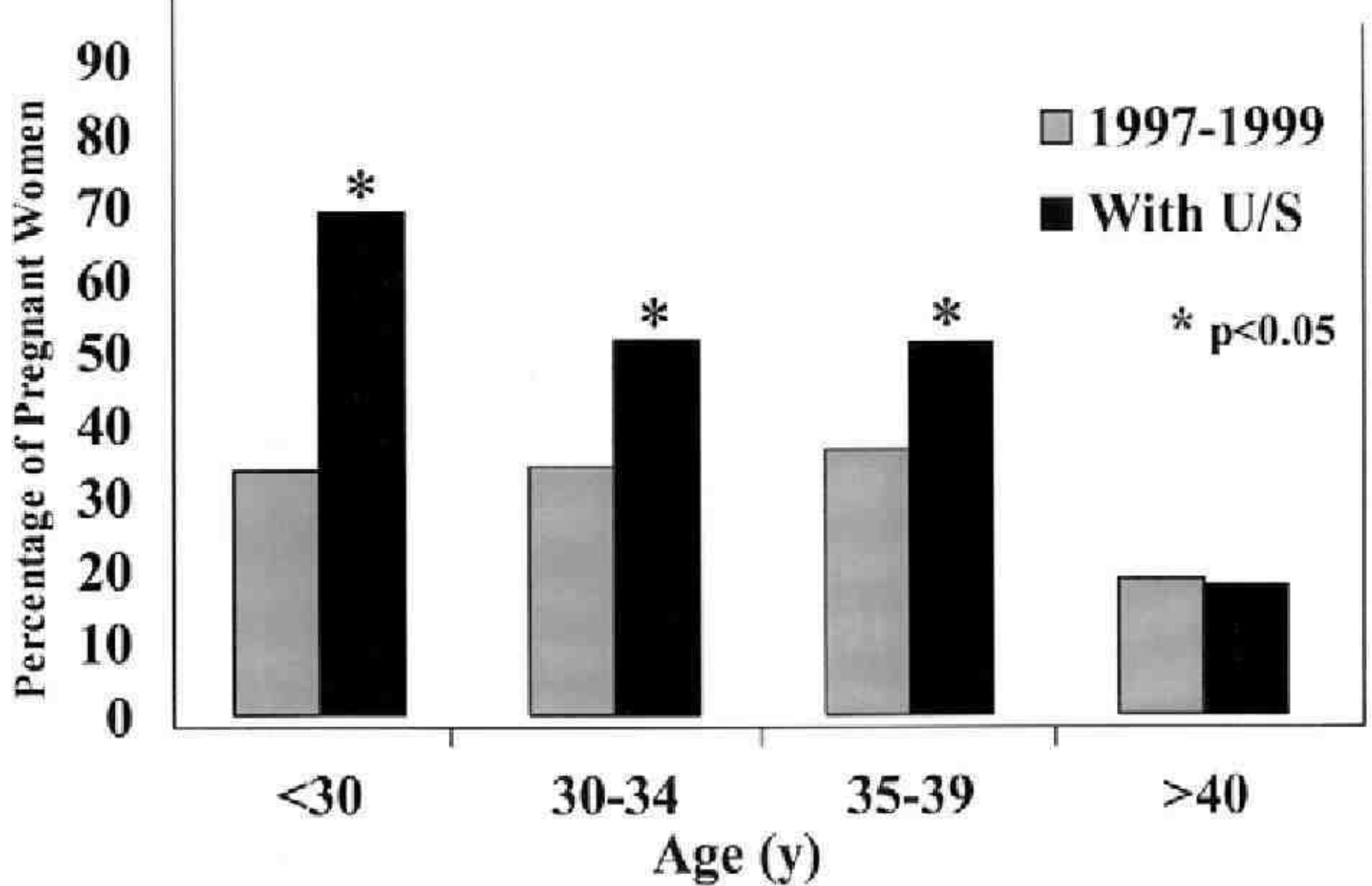
Transvaginal ultrasound-guided embryo transfer improves outcome in patients with previous failed in vitro fertilization cycles

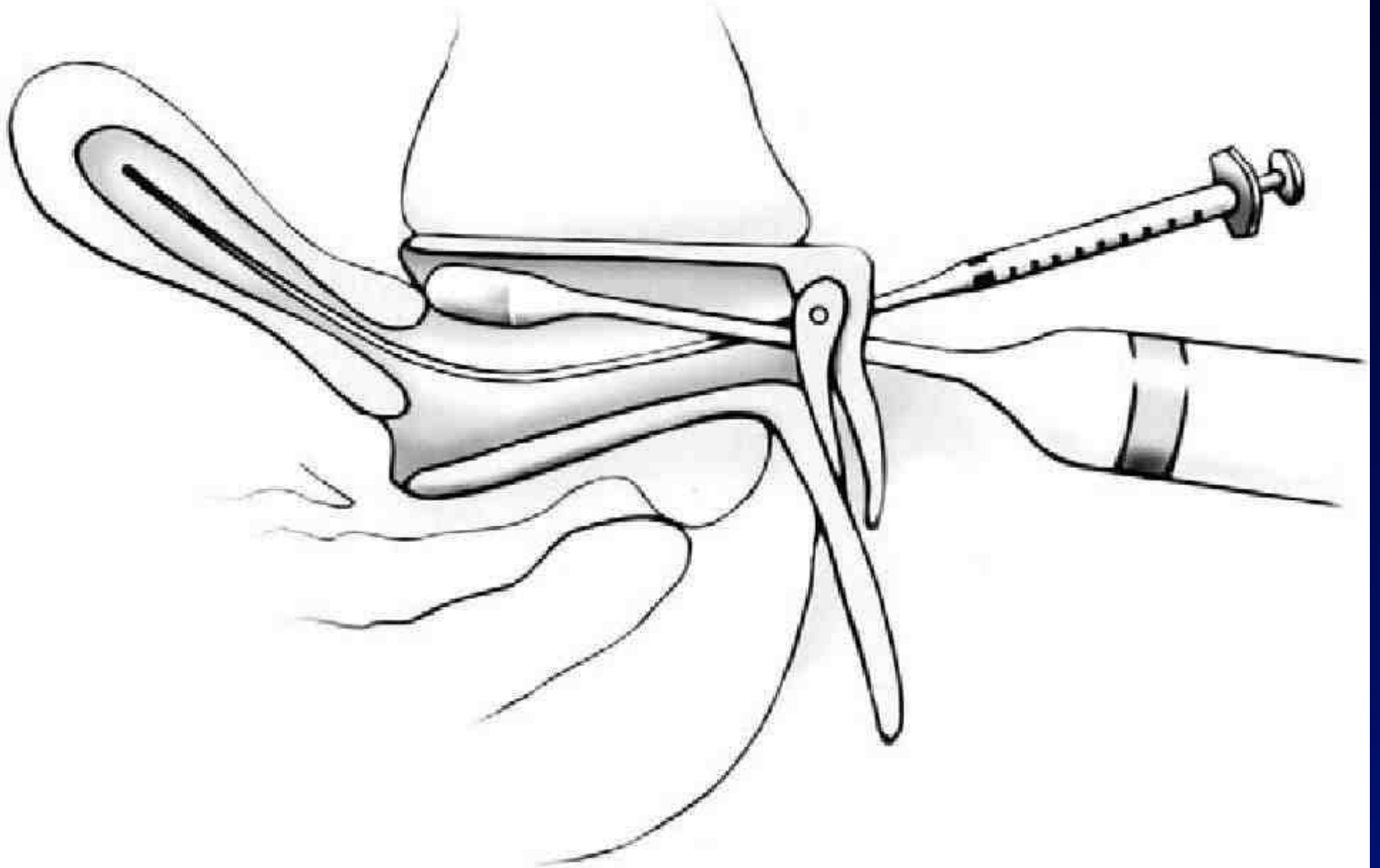
Retrospective

Fertil Steril 77:769-75, 2002

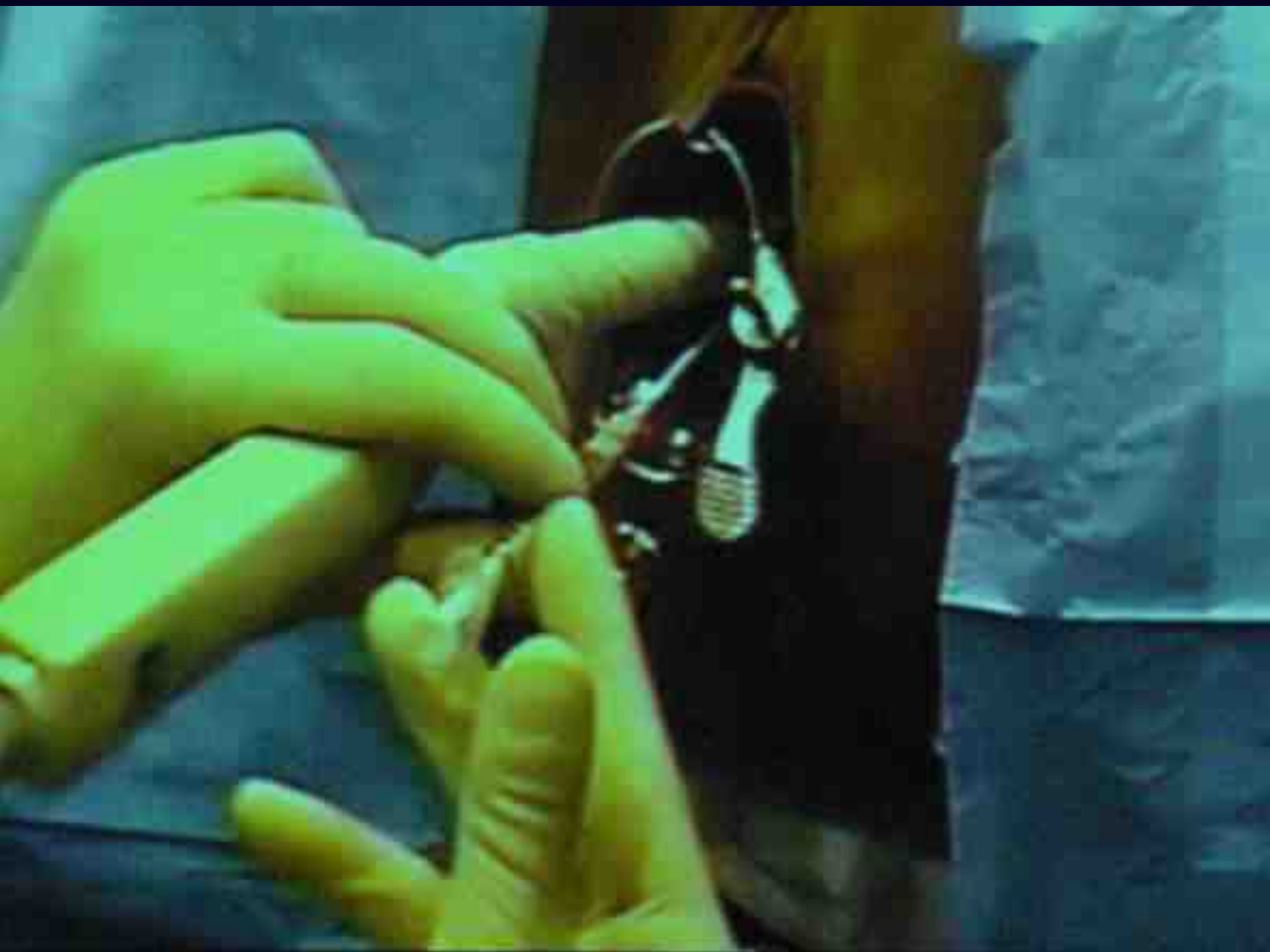
*Robert E. Anderson, M.D.,^a Nancy L. Nugent, M.S.,^a Amanda T. Gregg, B.Sc.,^a
Susan L. Nunn, B.S.,^a and Barry R. Behr, Ph.D.^b*

- Transvaginal ultrasound-guided ET may be responsible for successful IVF cycles in patients who had previously failed to conceive when embryos were transferred by the clinical touch method.
- Transvaginal ultrasound guidance may also be responsible for an overall increase in embryo implantation and pregnancy compared to the use of the clinical touch method









USG-guided ET *meta-analysis*

Sallam HN, Sadeck SS, *Fertil Steril* 80: 1042-6, 2003

Buckett WM, *Fertil Steril* 80: 1037-41, 2003

CONCLUSION

- **Ultrasound-guided embryo transfer improves clinical pregnancy rate and embryo implantation.**
- **Previous individual studies were too under-powered to demonstrate such improvements.**
- **There seems to be enough evidence to support the conviction that embryo transfer should be performed under abdominal ultrasound guidance in order to optimize the results of IVF and ICSI.**

Ultrasound versus 'clinical touch' for catheter guidance during embryo transfer in women (Review)



*Cochrane Database of Systematic Reviews 2010, Issue 1.
Art. No.: CD006107. DOI: 10.1002/14651858.CD006107.pub3.*

Brown J, Buckingham K, Abou-Setta AM, Buckett W

Authors' conclusions:

- The studies are limited by their quality **with only two studies** reporting details of both computerised randomisation techniques and adequate allocation concealment.
- Ultrasound guidance **does appear to improve the chances of live/ongoing and clinical pregnancies** compared with **clinical touch methods**.
- **No significant effect** on multiple pregnancy or ectopic pregnancy or miscarriage rates.

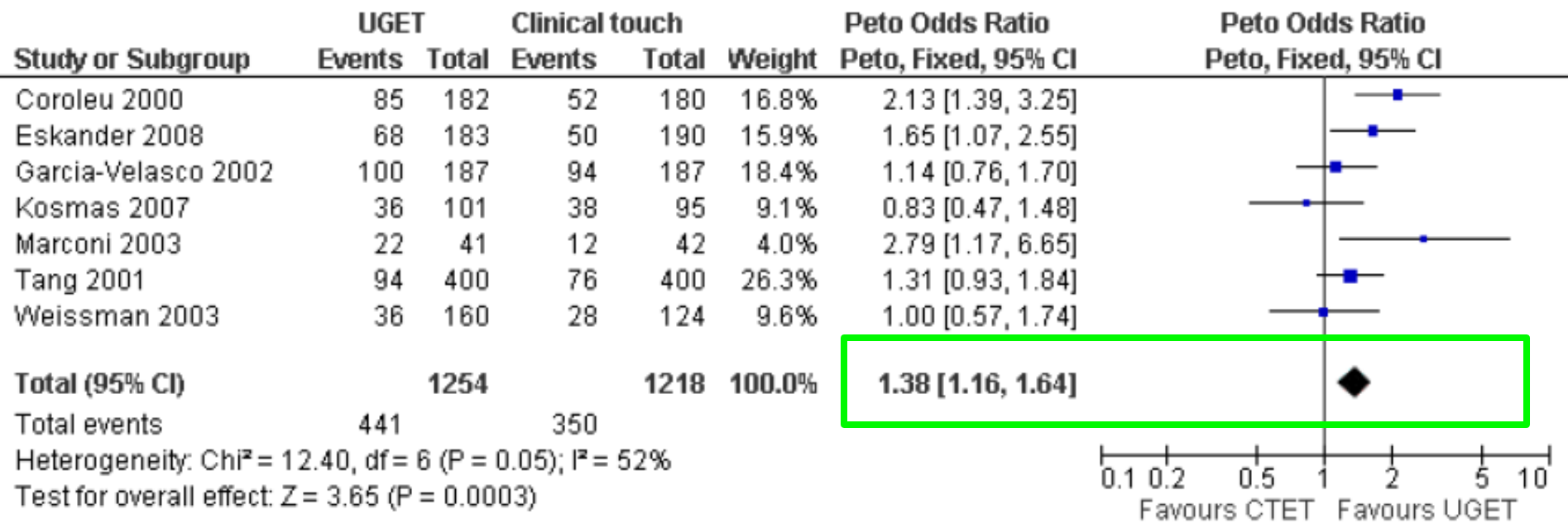
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Figure 4. Forest plot of comparison: **1 Pregnancy, outcome: 1.2 Ongoing pregnancies** (per woman randomised).



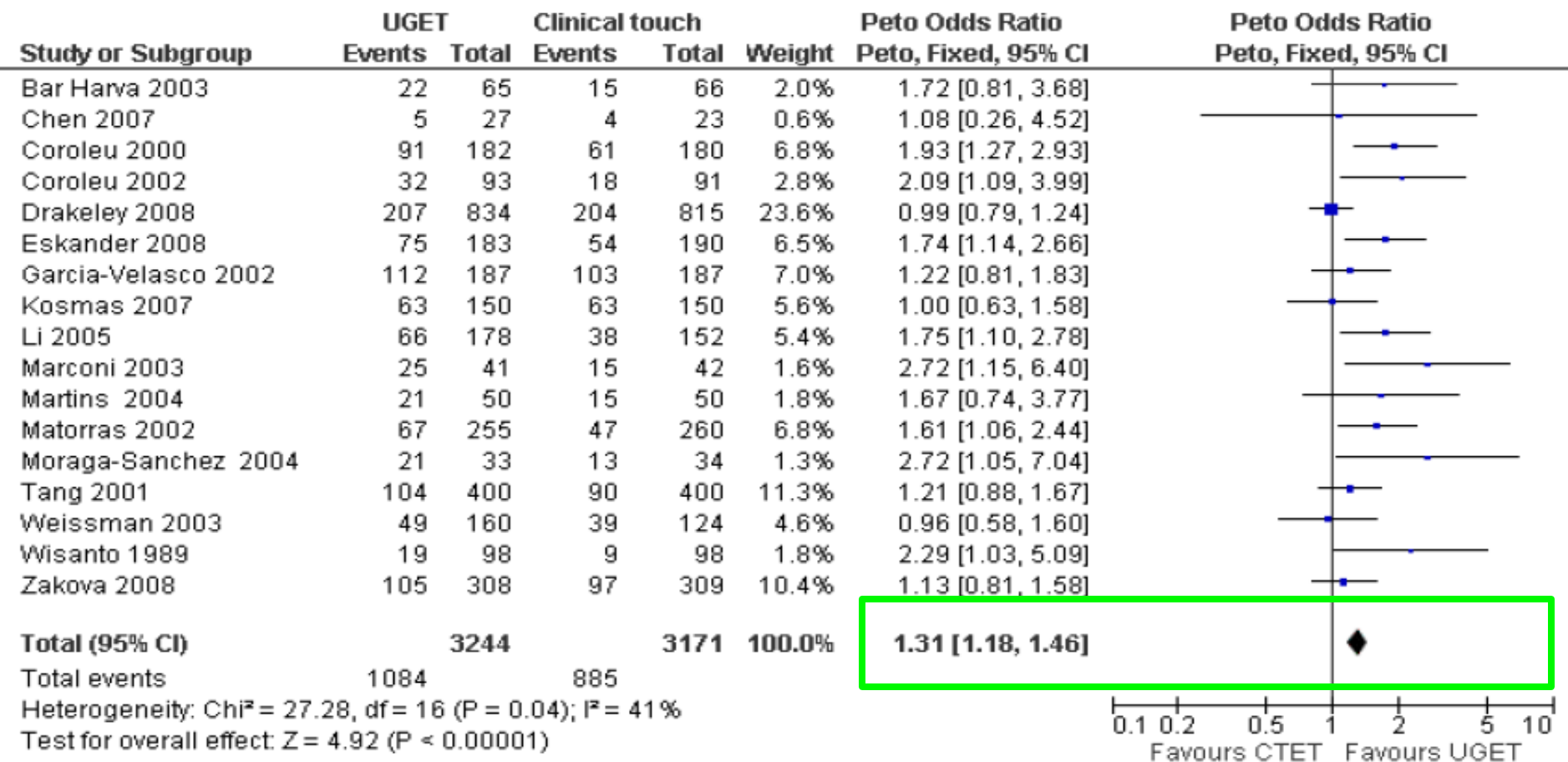
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Art. No.: CD006107. DOI: 10.1002/14651858.CD006107.pub3.*

Brown J, Buckingham K, Abou-Setta AM, Buckett W

Figure 5. Forest plot of comparison: 1 Pregnancy, outcome: 1.3 Clinical pregnancies (per woman randomised).



Embriyo Transfer Teknikleri

Süre - Basınç

- Embriyolar katetere yüklendikten sonra **en geç 120 saniye** içerisinde embriyo transferinin gerçekleştirilmesi önerilmektedir. **Matorras R, 2004**
- Sıcaklık, ışık, kateterdeki kimyasal maddeler gibi çevresel etkenler olumsuz etkili... **Ciray HN, 2007**
- Embriyoların kaviteye verilmesinden sonra, kateter uterustan tamamen geri çekilinceye kadar enjektörün pistonuna yapılan basınç sürdürülmelidir.
- İlaveten herhangi bir negatif basınç oluşturmamak için transfer kateterinin dış kılıfı iç kateter ile birlikte eş zamanlı olarak çekilmelidir.
- Kateterin yavaş yavaş çekilmesi, ayrıca negatif basınç oluşmasını engelleyecektir. **Martinez F, 2001; Sroga JM, 2010**

Embriyo Transfer Teknikleri

Deneme = Mock = Trial

- Stimülasyon öncesinde; önceki siklusun luteal fazında,
- Oosit toplanması sırasında veya
- Gerçek ET öncesinde... **Mains L, 2010**
- Kateter seçiminin daha doğru yapılması
- Uterus aksının ET öncesinde bilinmesi, kateterin ilerletilme yönü ve katetere ne oranda kavis verilmesi gerektiği
- Gerekli spekulum tipi,
- Tek dişliye ihtiyaç duyulup duyulmayacağı hakkında fikir vermektedir.
- Servikal Dilatasyon ??? (Mekanik, osmotik, HSK???)
- US > *Deneme transferi* ??? **Henne MB, 2004**

Embriyo Transfer Teknikleri

Serviks, vajen temizliđi

- SF ile temizlik → bakteri kontaminasyonu ↓
- Temizlik nazikçe yapılmalı
- Servikal mukus → embryo retansiyonu !!!
- ET sonrası kateterde embryo retansiyonu kontrolü !!!

Antibiotics prior to embryo transfer in ART (Review)



*Cochrane Database of Systematic Reviews 2012, Issue 3.
Art. No.: CD008995. DOI: 10.1002/14651858.CD008995.pub2.*

Kroon B, Hart RJ, Wong BMS, Ford E, Yazdani A

Figure 2. The influence of antibiotics prior to ET on clinical pregnancy rate

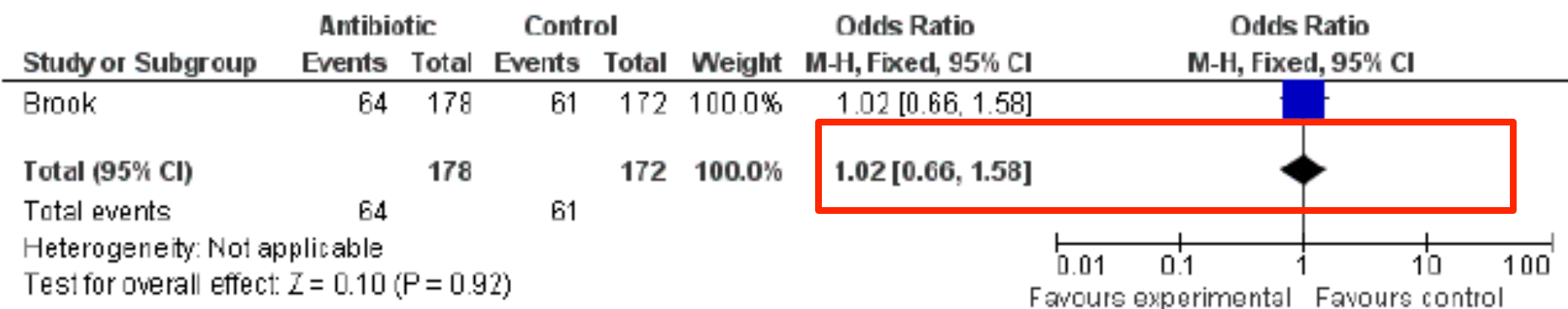
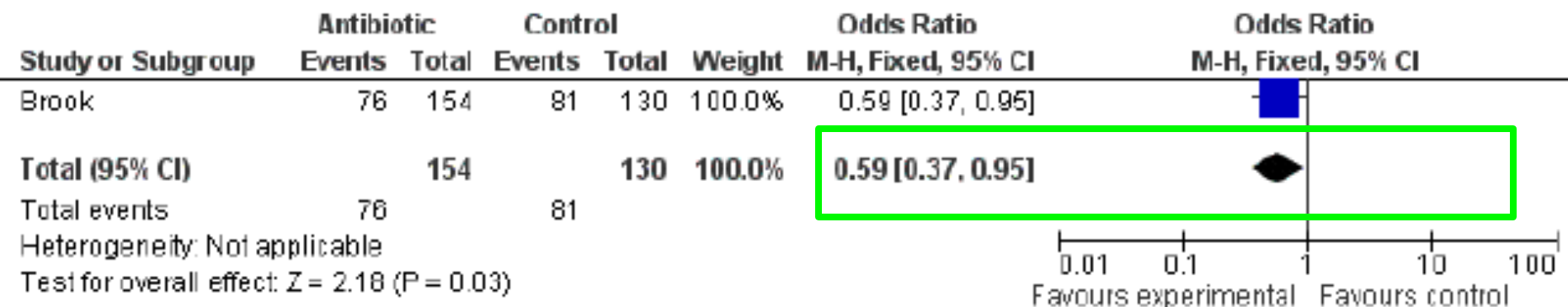


Figure 3. The influence of antibiotics prior to ET on genital tract colonisation rate





Tüp bebekte yeni umut: YAPIŞTIRICI

Amerika'dan getirilen "embryo glue" adlı bir sıvının kullanıldığı "embriyo yapıştırma tekniği", tüp bebek yöntemiyle gebe kalma ihtimalini iki katına çıkarıyor

▼ Olasılığı artırıyor

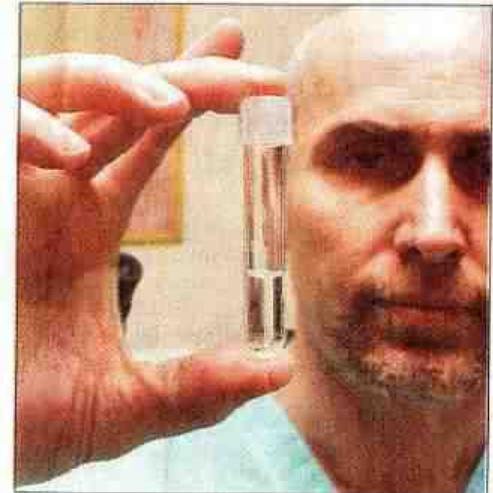
ABD'DEN sonra Türkiye'de de uygulanan "embriyo yapıştırma tekniği" ile tüp bebek yöntemiyle gebe kalma ihtimali iki katına çıkıyor. Amerikan Hastanesi'nde bu ay 15 hastaya uygulanan yöntem için ABD'den getirilen "embryo glue" adı verilen özel bir sıvı kullanılıyor. Amerikan Hastanesi Tüp Bebek Merkezi Başkanı Doç. Dr. Bülent Urman, her embriyo yerleştirilen üç hastadan ikisinin gebe kalamadığını belirterek, şunları söyledi:

▼ İki önemli sebebi var

"BAZI embriyolar rahim içine tutunabilirken, bazıları tutunamıyor. Bunun iki önemli sebebi var. Birincisi, embriyoda yaşa bağlı olarak yüzde 30 - 50 genetik anormallik olabilir. Veya embriyoların laboratuvar ortamında içinde büyütüldükleri sıvı, vücut sıvılarına birebir benzemiyor. Bu alanda dünya çapında yapılan pek çok araştırma sonucu yeni sıvılar geliştirildi. Bu ay 15 hastada kullandığımız embryo glue adlı özel sıvı ABD'den getirildi."

▼ Embriyo yapıştırıcısı

DOÇ. Dr. Urman, bu yeni sıvıyı şöyle anlattı: "Hyaluronik asit içeren, 'embryo glue', yani embriyo yapıştırıcısı olarak tabir edilen bu yeni sıvı, hem embriyoların daha sağlıklı bölünerek büyümesini sağlıyor, hem de rahim ağzına geldiğinden itibaren en uygun yeri bulup yuvalanmasını sağlıyor." ABD, Colaroda Yardımcı Üreme Teknikleri Merkezi'nde ilk kez 63 hastada kullanılan sıvı, gebelik oranlarını iki katına çıkarmış. ■ LEYLA ATAMAN İstanbul



Doç. Dr. Bülent Urman, "Bu sıvının şu an satışı yok. ABD'deki merkezle irtibatlarımız sonucu sıvıları getirebildik" dedi. Fotoğraf: OZAN GÜZELCE

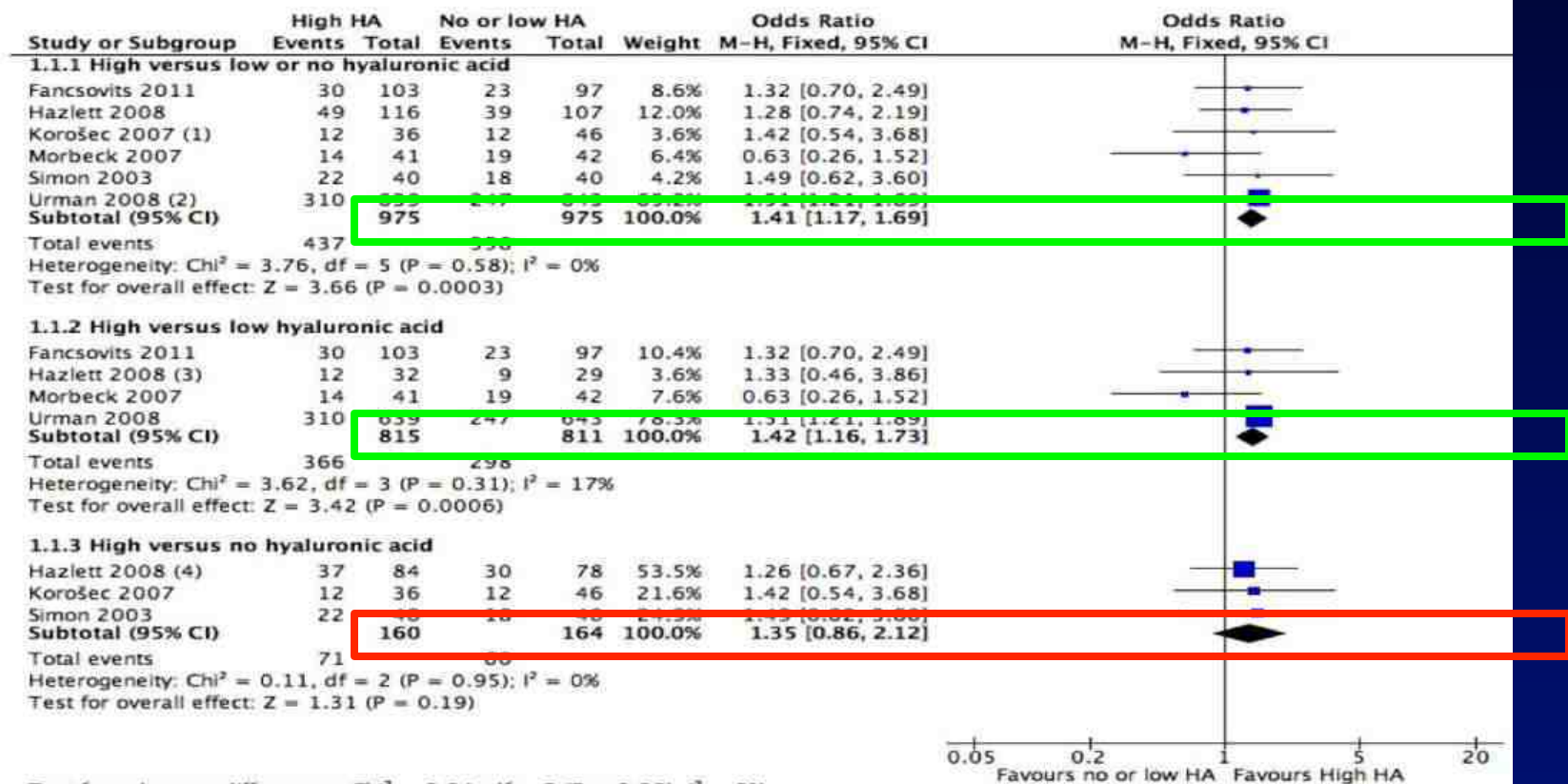
Adherence compounds in embryo transfer media for assisted reproductive technologies (Review)



*Cochrane Database of Systematic Reviews 2014, Issue 2.
Art. No.: CD007421. DOI: 10.1002/14651858.CD007421.pub3.*

Bontekoe S, Johnson N, Blake D

Figure 5. Forest plot of comparison: 1 High hyaluronic acid versus low/no hyaluronic acid, outcome: 1 Live birth rate.



Test for subgroup differences: $\text{Chi}^2 = 0.04$, $df = 2$ ($P = 0.98$), $I^2 = 0\%$

Footnotes

- (1) Only fresh embryo transfer data
- (2) Live birth data published in Balaban 2011
- (3) Hazlett Day 5 data only
- (4) Hazlett Day 3 data only

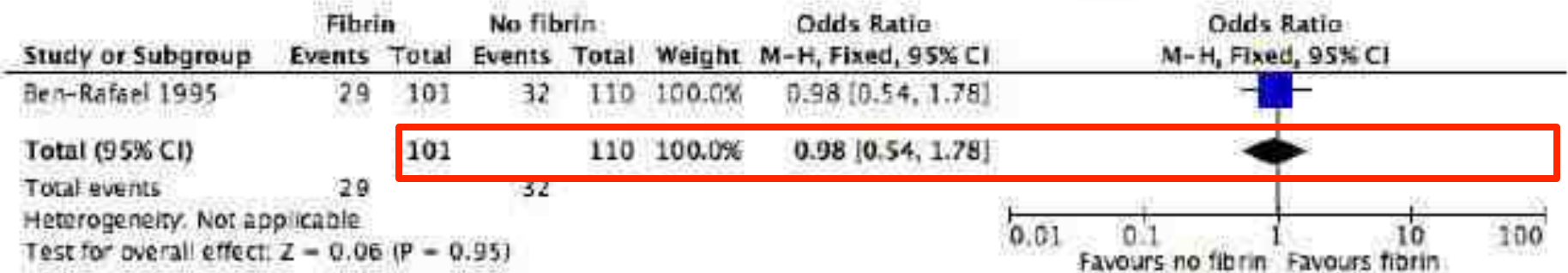
Adherence compounds in embryo transfer media for assisted reproductive technologies (Review)



*Cochrane Database of Systematic Reviews 2014, Issue 2.
Art. No.: CD007421. DOI: 10.1002/14651858.CD007421.pub3.*

Bontekoe S, Johnson N, Blake D

Figure 7. Forest plot of comparison: 2 Fibrin sealant versus no fibrin sealant, outcome: 2.1 Clinical pregnancy rate (per randomly assigned couple).



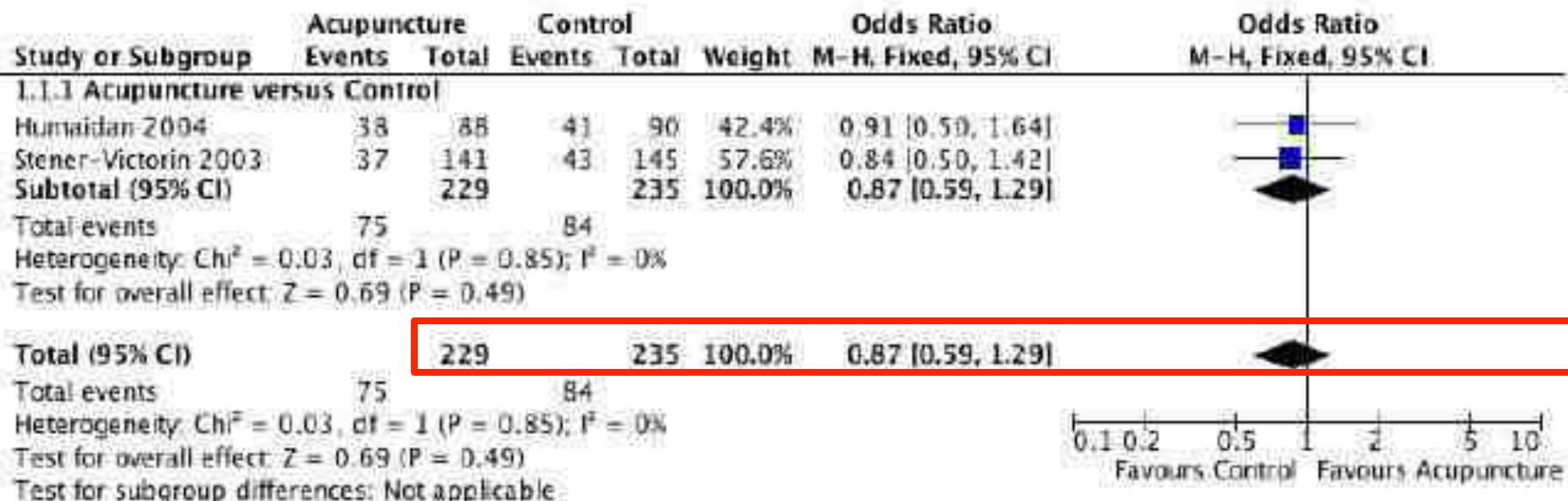
Acupuncture and assisted reproductive technology (Review)



*Cochrane Database of Systematic Reviews 2013, Issue 7.
Art. No.: CD006920. DOI: 10.1002/14651858.CD006920.pub3..*

Cheong YC, Dix S, Hung Yu Ng E, Ledger WL, Farquhar C

Figure 4. Forest plot of comparison: I Acupuncture around the time of oocyte retrieval versus control (sham, placebo, no acupuncture), outcome: I.I Live Birth Rate.



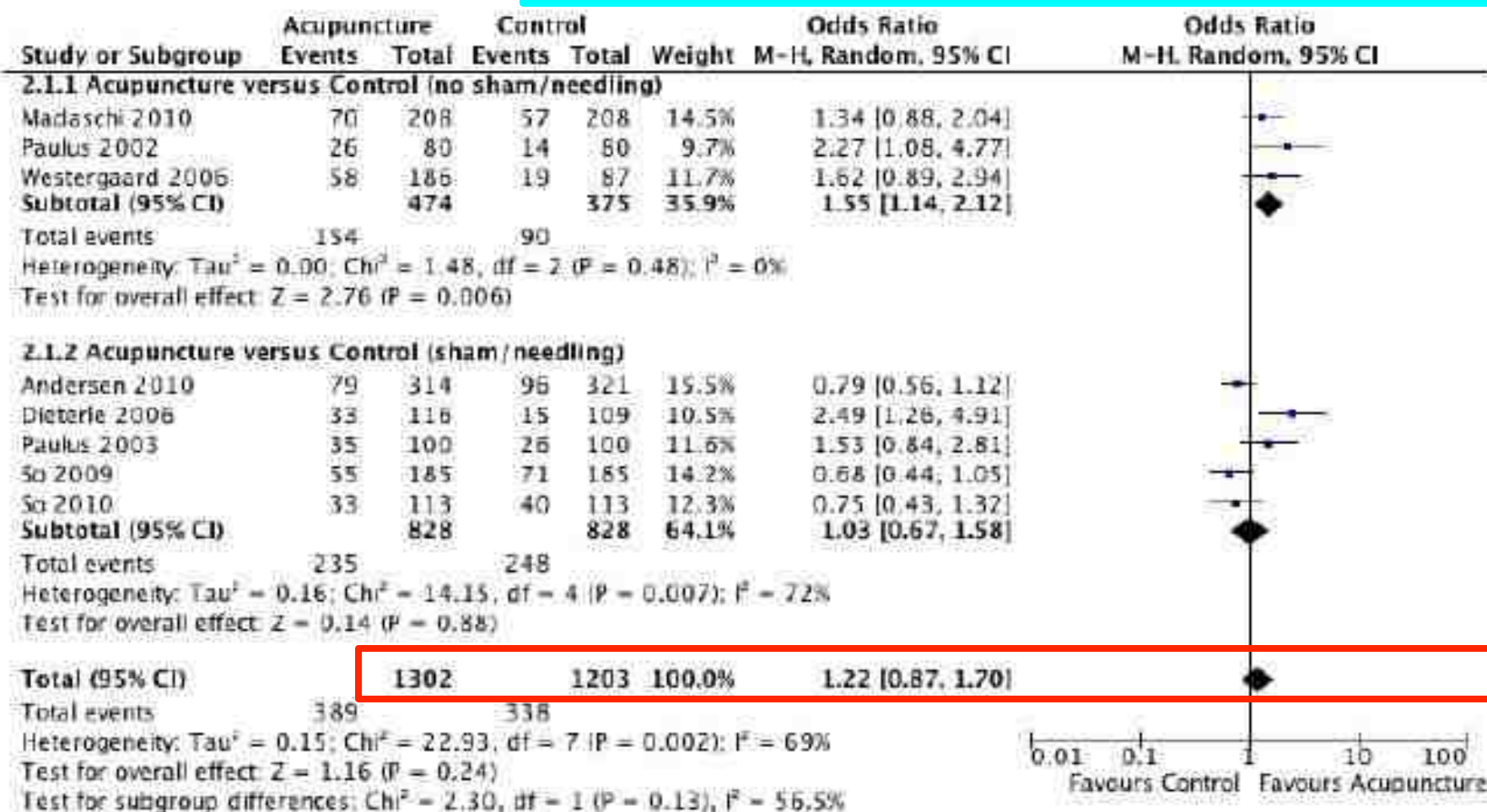
Acupuncture and assisted reproductive technology (Review)



*Cochrane Database of Systematic Reviews 2013, Issue 7.
Art. No.: CD006920. DOI: 10.1002/14651858.CD006920.pub3..*

Cheong YC, Dix S, Hung Yu Ng E, Ledger WL, Farquhar C

Figure 6. Forest plot of comparison: 2 Acupuncture on and around the day of ET versus control, outcome: 2.1 Live Birth.





Endometrial injury in women undergoing assisted reproductive techniques (Review)

*Cochrane Database of Systematic Reviews 2015, Issue 3.
Art. No.: CD009517. DOI: 10.1002/14651858.CD009517.pub3.*

Nastri CO, Lensen SF, Gibreel A, Raine-Fenning N, Ferriani RA, Bhattacharya S, Martins WP

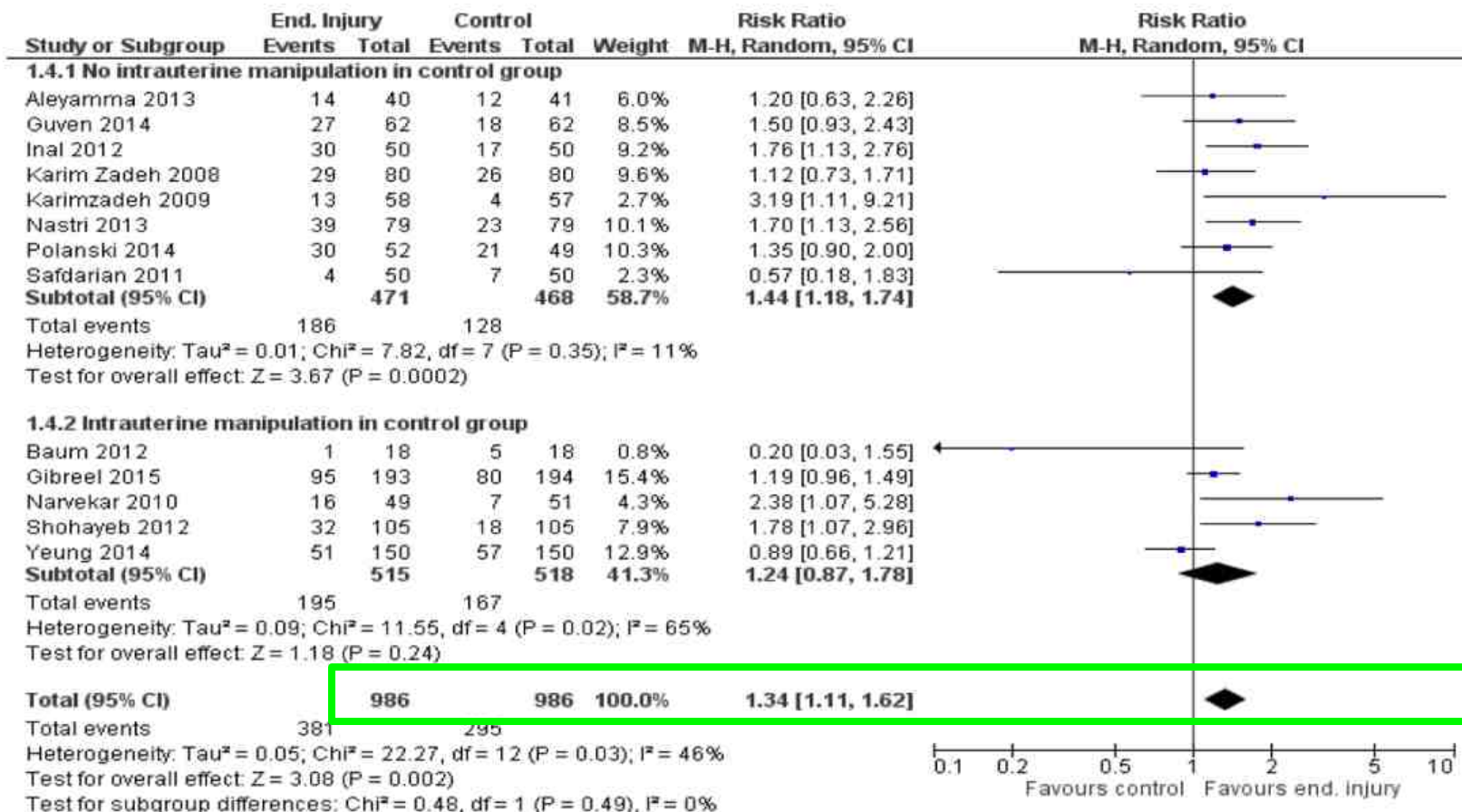
- Moderate-quality evidence indicates that endometrial injury performed between day 7 of the previous cycle and day 7 of the embryo transfer (ET) cycle is associated with an **improvement in live birth and clinical pregnancy rates** in women with more than two previous embryo transfers.
- There is no evidence of an effect on miscarriage, multiple pregnancy or bleeding.
- The procedure is mildly painful.
- Endometrial injury on the day of oocyte retrieval is associated with a **reduction of clinical and ongoing pregnancy rates.**

Endometrial injury in women undergoing assisted reproductive techniques (Review)

*Cochrane Database of Systematic Reviews 2015, Issue 3.
Art. No.: CD009517. DOI: 10.1002/14651858.CD009517.pub3.*

Nastri CO, Lensen SF, Gibreel A, Raine-Fenning N, Ferriani RA, Bhattacharya S, Martins WP

Figure 7. Forest plot of comparison: 1 Endometrial injury between day 7 of the previous cycle and day 7 of ET cycle vs control, outcome: 1.4 Clinical pregnancy per randomly assigned woman (by manipulation/no manipulation in control group).



Embriyo Transfer Teknikleri

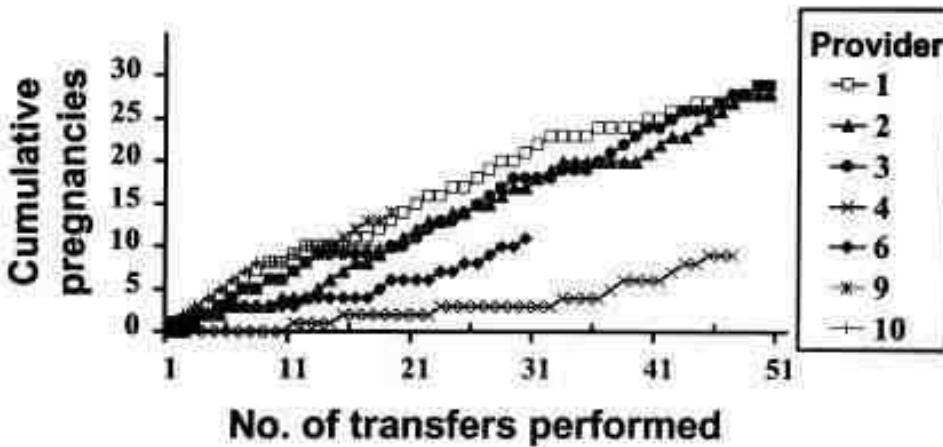
ET yapan kişi / hekim

Pregnancy rates after embryo transfer depend on the provider at embryo transfer

FERTILITY AND STERILITY®
VOL. 74, NO. 1, JULY 2000

Rhonda M. Hearn-Stokes, M.D.,^{a,b} Bradley T. Miller, M.D.,^{a,c} Lynette Scott, Ph.D.,^a
David Creuss, Ph.D.,^c Prabir K. Chakraborty, Ph.D.,^c and James H. Segars, M.D.^b

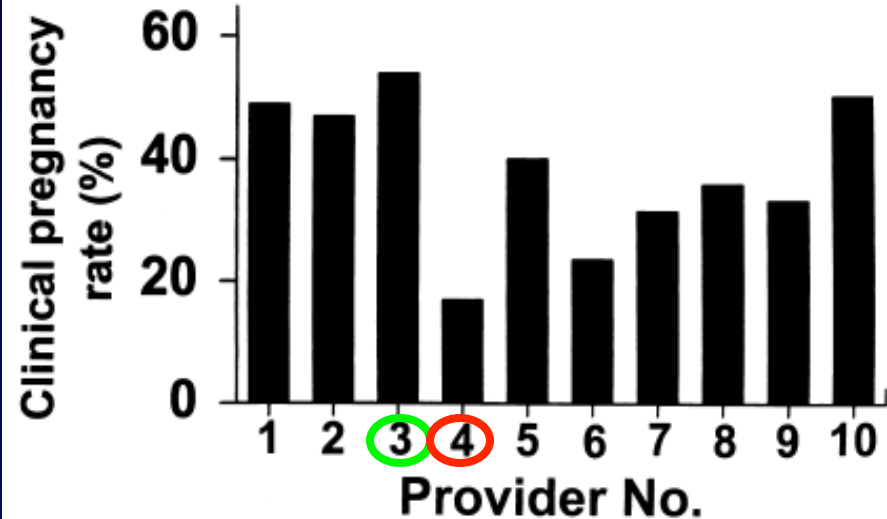
Walter Reed Army Medical Center and National Institute of Child Health and Human Development,
National Institutes of Health, Washington, D.C.; and Uniformed Services University of the Health Sciences,
Bethesda, Maryland



Hearn-Stokes. Pregnancy rates after ET. Fertil Steril 2000.

FIGURE 1

Average clinical pregnancy rates among providers performing embryo transfers. The pregnancy rates achieved by providers differed significantly ($P < .05$; χ^2).



Hearn-Stokes. Pregnancy rates after ET. Fertil Steril 2000.

- 617 hasta; 854 ET, ET yapan 10 farklı kişi, 1996-1999
- Klinik Gebelik oranı: ortalama %46 / ET (%17-%54)

Embriyo Transfer Teknikleri

ET yapan kişi / hekim

Tr_dr	ET (n)	Klinik gebelik	PR	P	B (Formül katsayısı)	OR (Odds ratio)
MI	104	22	21.2	.924	.021	1.021
TE	158	39	24.7	.427	.142	1.153
SK	145	32	22.1	.742	-.063	.939
EO	155	29	18.7	.134	-.291	.747
LMS	115	27	23.5	.885	.030	1.031
IC	312	107	34.3	.000	.668	1.951
PO	161	25	15.5	.013	-.508	.602
Toplam	1150	281	24.4			1.000
YAS				.007	-.038	.963
TR_EMB				.000	.362	1.436
Constant				.005	-1.492	.225

- **IUCTFIVF**; 2002-2004; 1150 ET; logReg analizi
- **KG/ET: %24.4 (%15.5 (OR: 0.60; p=0.013) - %34.3 (OR: 1.95; p=0.001))**

Embriyo Transfer Teknikleri

ET kateteri / hacim

- Yumuşak kateter !!!
- Ancak çok gerekli olduğunda sert kateter ...
- Tenakulum olabildiğince kullanılmamalı ...
- Medyum hacmi: $\cong 20 \mu\text{L}$ (10-30; maks: 60)

Embriyo Transfer Teknikleri

Yatak istirahati

- 30 (-60) dk yeterli ???

European Journal of Obstetrics & Gynecology and Reproductive Biology 155 (2011) 125–128



Contents lists available at ScienceDirect

European Journal of Obstetrics & Gynecology and
Reproductive Biology

journal homepage: www.elsevier.com/locate/ejogrb



Review

Bed rest after embryo transfer

Bin Li^a, Hong Zhou^a, Weihong Li^{b,*}

^aDepartment of Pharmacology, College of Pharmacy, Third Military Medical University, Chongqing 400038, China

^bReproductive Medical Center, First affiliated Hospital, Chongqing Medical University, Chongqing 400016, China

- 3 RCT; n=724; ET sonrası yatak istirahatinin gerekli olduğuna dair henüz yeterli kanıt yok.

Embriyo Transfer Teknikleri

Yatak istirahati

Post-embryo transfer interventions for assisted reproduction technology cycles (Review)



*Cochrane Database of Systematic Reviews 2014, Issue 8.
Art. No.: CD006567. DOI: 10.1002/14651858.CD006567.pub3..*

Abou-Setta AM, Peters LR, D'Angelo A, Sallam HN, Hart RJ, Al-Inany HG

Authors' conclusions

- There is **insufficient** evidence to support any specific length of time for women to remain recumbent following embryo transfer

Bed rest after embryo transfer negatively affects in vitro fertilization: a randomized controlled clinical trial

Fertil Steril 2013;100: 729–35

Sharayu Gaikwad, M.D.,^a Nicolas Garrido, Ph.D.,^a Ana Cobo, Ph.D.,^a Antonio Pellicer, M.D.,^{a,b} and José Remohi, M.D.^{a,b}

^a Instituto Valenciano de Infertilidad Valencia and ^b Universidad de Valencia, Valencia, Spain

Outcomes for NR and R groups who underwent IVF treatment with donated oocytes.

Clinical trial outcome	NR (n = 120)	R (n = 120)	10 min.	Risk difference odds ratio	P value
β -hCG positive tests	90 (75.0) [66.6–81.9]	83 (69.2) [60.4–76.7]		5.8 [0–17.0] 1.1 [0.9–1.2]	.32
Implantation rate	(45.8) [38.8–52.9]	(41.7) [34.6–48.7]		4.1 [–4.7 to 13.1] 1.2 [0.8–1.7]	.35
Total miscarriages	22 (18.3) [12.4–26.2]	33 (27.5) [20.3–36.1]		–9.2 [–19.7 to 1.4] 0.6 [0.3–1.1]	.09
Biochemical miscarriages (% per pregnancy)	12 (13.3) [6.3–20.4]	10 (12.0) [5.0–19.0]		1.3 [–8.6 to 11.2] 1.1 [0.5–2.8]	.80
Clinical miscarriages (% per pregnancy)	10 (11.1) [4.6–17.6]	20 (24.0) [24.0–26.2]		–13.0 [–4.4 to –1.7] 0.4 [0.2–0.9]	.04
Ectopic pregnancy	0	3		Not applicable	.21
Deliveries (% per patient)	68 (56.7) [47.7–65.2]	50 ^a (41.6) [33.2 to 50.6]		15.0 [2.5–27.5] 1.8 [1.1–3.1]	.02
Single pregnancies (% per pregnancy)	39 (43.3) [33.1–53.6]	28 (33.7) [23.6 to 43.9]		9.5 [–4.8 to 24.0] 1.5 [0.8–2.8]	.20
Twin pregnancies (% per pregnancy)	29 (32.2) [22.6–41.9]	22 (26.5) [17.0–36.0]		5.7 [–7.8 to 19.3] 1.3 [0.7–1.9]	.41
Total live newborn infants	97	72			

Note: Values are means, with percentages in parentheses and corresponding 95% confidence interval in brackets. NR = group of patients allowed to ambulate immediately (no rest) after ET; R = control group, where patients received 10 minutes of BR immediately after ET. No significant differences were identified between the two groups.

^a One patient had monochorionic diamniotic twins in one gestational sac and a single fetus in another sac.

ASRM 2015 –

**VIRTAMED
ET Simulator**



ASRM 2015 – VIRTAMED ET Simulator

ASRM Embryo Transfer Module

Virtual reality training simulator for embryo transfer – developed with ASRM

Patient safety

- Comprehensive training without any risk
- Practice the procedure as many times as you want, on numerous different cases
- No need to practice on live, anxious patients

High technology

- Combination of authentic tools, virtual reality and anatomic models enables high visual and tactile realism
- Magnetic trackers translate every move in the anatomic model into virtual reality
- Designed and manufactured in Switzerland

Compatibility

- Easily compatible with VirtaMed PelvicSim™, a simulator for IUD insertion, and VirtaMed HystSim™, the only virtual reality simulator for hysteroscopy
- Platform compatible with all VirtaMed simulators

Customized training

- Simulation tutorials help you get started
- Customized training courses and feedback reports track progress on the learning curve
- Various cervical canals and uteri, as well as patient cases ranging from easy to difficult prepare you for challenges in the real procedure



” The evidence is clear that simulation is the best training modality for new physicians. Embryo transfer is an absolutely foundational part of modern infertility treatment. With the development of a virtual reality simulator for embryo transfer we are bringing an outstanding training tool to bear on one of the most vital procedures in the field.

- Owen Davis, MD President-elect of the ASRM.



” What I like best about VirtaMed PelvicSim™ is the combination of real tactile sensation from a pelvic model and the large variety of training scenarios thanks to virtual reality simulation. I am convinced that this will improve education in gynecology, and thus enhance patient safety and comfort.

- Prof. Dr. med. Michael Bajka, MD, med. adviser Bayer CH&EU, MSD, HygIS SA.

ASRM Embryo Transfer Module essentials

Authentic tools

The authentic tools make the procedure feel just like the real thing: you get to work with a bendable guide catheter and a soft transfer catheter, and transfer the embryos with a syringe. The whole procedure can be monitored with an adjustable transabdominal ultrasound probe; and even a stylet is available, if needed. The pelvic model, with its interchangeable cervical canals, provides tactile feedback and makes the training a life-like experience.



ASRM 2015 – VIRTAMED ET Simulator

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Embriyo Transfer Teknikleri

Sonuç

- Yumuşak transfer kateterleri kullanmaya çalışmak
- USG eşliğinde embriyo transferi yapmak
- Deneme (=mock) transferi yapmak
- Transfer öncesi servikal mukusu temizlemek (medyum?)
- Tek dişli kullanmamak
- Embriyoları fundusun 2 cm aşağısına bırakmak
- Yapıştırıcı ???
- Antibiyotik ???
- ET sonrası yatak istirahati
- ET yapan kişi
- Endometriyum hasarı ???
- ...