

for the Endocervical Lavage group versus a 20.55% CP rate for the Control group.

Conclusion: These data suggest that the Endocervical Lavage Technique for Embryo Transfer may enhance the likelihood of pregnancy. Removal of cervical mucus allows more effective delivery of embryos to the uterus. Microorganisms present in the cervical mucus are washed away and not introduced into the uterus during transfer. The Upgraded B2 INRA medium contains penicillin & streptomycin which may help to reduce the inoculum of micro-organisms into the uterus thus creating a favorable environment for implantation.

### P-29

**Prospective randomized comparison of an ultrasound-guided embryo transfer versus a blind catheter placement.** Guillermo Marconi, Edgardo Young Jr., Martin Vilela, Ariel Bello, Edgardo Young Sr., Carlos Sueldo. Inst de Fertilidad, Buenos Aires, Argentina.

Objective: It is generally accepted that an atraumatic embryo transfer is essential for successful implantation (Schoolcraft, 2002). Recently, we showed that soft catheters cause significantly less endometrial trauma than rigid or semirigid catheters (Marconi et al, 2003).

Our objective is to evaluate the performance of an ultrasound guided echodense tip catheter vs. a commonly used semirigid catheter placed without ultrasound guidance in good prognosis IVF patients.

Design: A prospective randomized study in a University-Affiliated IVF Unit.

Materials and Methods: A total of 83 IVF patients were included in the study. They were all under 38 years of age and had a day 3 FSH under 12 IU/ml. Controlled ovarian hyperstimulation was done by using rFSH from either day 2 or 3 at 225 IU s.c. daily. The GnRH antagonist at 0.25 mg. s.c. daily was given when the largest follicle reached 14-15 mm in diameter. HCG at 10,000 IU was administered when the leading follicle was at least 18mm in diameter 35-36 hs prior to oocyte retrieval.

Embryo transfer was performed on day 3 post aspiration using an echodense tip catheter (Echotip Cook, USA) under ultrasound guidance in 41 patients and the Frydman Catheter (Laboratoire CCD, Paris, France) in 42 patients without ultrasound guidance.

Results: Refer to table:

	GROUP A (ECHOTIP) N=41	GROUP B (FRYDMAN) N=42	P
AGE	31.8 +/- 2.67	32.5 +/- 3.88	NS
STIMULATION DAYS	9.14 +/- 1.73	8.50 +/- 1.39	NS
N AMPOULES (75UI)	28.4 +/- 9.31	25.6 +/- 9.76	NS
RETRIEVED OOCYTES	9.96 +/- 4.34	10.31 +/- 5.22	NS
FERTILIZED OOCYTES IN 2 PN	6.83 +/- 3.04	6.69 +/- 3.86	NS
NUMBER OF TRANSFERRED EMBRYOS/PATIENT	3.48 +/- 0.67	3.65 +/- 0.69	NS
PREGNANCY RATE	60.8%	34.6%	P < 0.05
IMPLANTATION RATE	25.6%	8.42%	P < 0.051
ONGOING PREGNANCY RATE	53.2%	29.3%	P < 0.05

Conclusion: Our data from this prospective study shows that embryo transfers in good prognosis IVF patients, performed under ultrasound guidance with an echodense tip catheter, offers significantly higher implantation and ongoing pregnancy rates in comparison to the use of a semirigid catheter without ultrasound.

### P-30

**Uterine position at real embryo transfer compared to mock embryo transfer.** Melinda B. Henne, Sunny Jun, Amin A. Milki. Stanford Univ, Stanford, CA.

Objective: In order to optimize embryo transfer (ET), mock ET is practiced routinely by IVF programs to assess uterine depth and position. The uterine position may vary between a mock ET and the real ET due to the enlarged ovaries in the posterior cul-de-sac, especially when the uterus is retroverted. The purpose of this study is to determine the consistency in uterine position at ET compared to mock ET, depending on whether the uterus is anteverted (A/V) or retroverted (R/V) at mock ET.

Design: Retrospective data analysis.

Materials and Methods: Patients undergoing IVF between January 2001 and September 2002 in the senior author's practice were evaluated. All had abdominal ultrasound guided mock ET during a natural cycle at initial evaluation. Real ET was performed under abdominal ultrasound guidance with a full bladder. The senior author performed all mock and real ETs. Uterine position was recorded for all patients at the time of mock ET and real ET.

Results: During the study period, 636 fresh ETs were performed on 424 patients; 159 ETs were performed on 101 patients with a R/V uterus identified at time of mock ET; 477 ETs were performed on 323 patients with an A/V uterus identified at time of mock ET. At the time of real ET, 88 (55.3%) previously identified R/V uteri converted to an A/V position. Conversely, only 8 (1.7%) previously identified A/V uteri converted to a R/V position.

Conclusion: Our data suggest that a R/V uterus at mock ET, will often change position at the time of real ET. A smooth embryo transfer is critical for IVF success. Cramping and disruption of the endometrium from misdirecting the ET catheter are detrimental and can be avoided by accurate knowledge of the uterine position at the time of ET. This information can be more accurately obtained if ultrasound guidance is performed routinely during ET. Additionally, we recommend that patients with a R/V uterus should still have a full bladder for ET, since more than half of them will convert to an A/V position, and will benefit from the bladder effect in straightening the angle of the uterus.

## ART: CLINICAL ADJUNCTIVE THERAPIES

### P-31

**Hyperbaric oxygen therapy and in vitro fertilization—A pilot study.** Bradley J. Van Voorhis, J. E. Greensmith, Anuja Dokras, Michelle R. Maifeld, Amy E. T. Sparks, Craig H. Syrop. Univ of Iowa Coll of Medicine, Iowa City, IA.

Objective: To determine the safety, tolerability and effects of hyperbaric oxygen therapy (HBO) when used during ovarian stimulation for IVF. Angiogenesis and oxygen delivery is critical to the preovulatory ovarian follicle. Impaired angiogenesis in the ovary has been hypothesized to contribute to reduced fertility and increased errors of meiosis in older reproductive age women. Hyperbaric oxygen therapy (HBO) greatly increases tissue oxygen tension and VEGF concentrations, leading to increased angiogenesis in hypoxic tissues.

Design: Pilot study of 10 women undergoing IVF treatment.

Materials and Methods: Women had to be in a relatively poor prognosis group for IVF; a) age 40 and above or b) age 35-40 with a previously cancelled IVF cycle for poor stimulation. All participants were stimulated with a GnRHa microdose "flare" protocol. HBO dives occurred each day (Monday-Friday only) for 2 hours at 2.4 atmospheres of pressure while breathing 100% oxygen. HBO started on the first day of GnRHa administration and continued each weekday until the day of oocyte retrieval. Women were questioned about standard side effects of HBO and IVF. Comparisons of IVF outcomes were made to historical controls (women meeting study entrance criterion in our program in the 6 years prior to the start of this study) and concurrent controls (eligible subjects declining entrance into the HBO arm of the study). At oocyte retrieval, one or two pure follicular fluid samples were collected and frozen from all women treated with HBO and from some of the concurrent control women. VEGF concentrations were measured by an immunoassay.

Results: The median number of HBO "dives" was 9.5 (range 4-11). HBO was well-tolerated during ovarian stimulation for IVF. One woman dropped out of the study for development of sinus headaches. Otherwise only minor side effects were noted. IVF outcomes are listed in the table. Of 5 women receiving HBO who had an embryo transfer, 2 women are pregnant and both have ongoing twin gestations. Follicular fluid VEGF levels were higher in HBO treated women (n= 10 samples) than in 5 control samples (4649 + 2055 pg/mL versus 1906 + 1047 pg/mL, p < 0.004).

IVF outcomes in women treated with HBO and in control women			
outcomes	HBO subjects	concurrent controls	historical controls
number of cycles	10	13	145
mean age	40.4	38.9	39.9
cycle cancellation rate	50%	46%	36%
mean oocytes retrieved	9.4	6.8	8.8
implantation rate	22.2% (4/18)	26.6% (4/15)	9.7%
clinical pregnancy rate/ transfer	40% (2/5)	43% (3/7)	21.8%
ongoing pregnancy rate/ transfer	40% (2/5)	43% (3/7)	16.1%

Conclusion: HBO is well-tolerated by women having IVF. Pilot data are not encouraging that this therapy will reduce the high cycle cancellation rates seen in poor-prognosis women. Comparisons with historical controls but not concurrent controls (who tended to be younger than HBO subjects) suggest possible improvements in embryo implantation and pregnancy rates per transfer associated with HBO. Much larger prospective randomized trials will be required to prove the value of HBO in IVF.

### P-32

#### Intramuscular versus vaginal progesterone in assisted reproduction. Eleonora Porcu. Università di Bologna Hosp S. Orsola, Bologna, Italy.

Objective: A luteal phase defect has been demonstrated in IVF cycles using a gonadotrophin releasing hormone agonist (GnRH-a). Progesterone appears to be necessary for implantation and maintenance of an early intrauterine pregnancy.

To determine the effectiveness of two routes of progesterone supplementation by intramuscular vs. vaginal administration, for luteal phase support of patients undergoing in vitro fertilization (IVF) procedure.

Materials and Methods: 224 patients were randomly allocated to two groups in order to compare two treatment protocols: group A natural progesterone 50 mg/day i.m. (Prontogest, AMSA, Italy.); group B: micronized progesterone 200 mg/day vaginal (Esolut, Angelini, Italy). Pregnancy rate per embryo transfer and endometrial thickness in mid luteal phase were compared.

Results: There were no statistically significant differences in pregnancy rate between the two groups. The pregnancy rate per transfer for i.m. progesterone groups was 24.1% and for vaginal group was 26.7%. The endometrial thickness was not statistically differences between the two group. (Group A: 12mm; Group B: 11 mm. ).

Conclusion: The route of post-transfer progesterone administration does not appear to affect the pregnancy rate in IVF cycles. Comparable results can be achieved with both intramuscular and vaginal therapy. However the last route may be preferable due to better patients compliance and lower side effects.

### P-33

#### Motility of the endometrium after acupuncture treatment. Wolfgang E. Paulus, Mingmin Zhang, Erwin Strehler, Karl Sterzik. Christian-Lauritzen-Institut, Ulm, Germany; Tongji Hosp, Tongji Medical Coll, Huazhong Univ of Science & Technology, Wuhan, China.

Objective: Acupuncture seems to be a useful tool for improving pregnancy rate after assisted reproduction therapy (ART) as we have shown in a former study. Uterine peristaltic waves may displace the embryo droplet at the time of embryo transfer. To investigate the possible influence of acupuncture on uterine contractility, we visualized the motility of the endometrium by ultrasound comparing two groups with/without acupuncture treatment shortly before and after embryo transfer.

Design: Prospective cohort study.

Materials and Methods: 164 patients undergoing ART (ICSI, IVF) in our fertility centre were included in this study. Only patients with a morphologically normal uterus were admitted. After in-vitro fertilization up to three embryos were transferred into the uterine cavity on day 2 to 6 after oocyte retrieval. Acupuncture was performed in 95 patients 25 minutes before and after embryo transfer with sterile disposable stainless steel needles (0.25 x 25 mm) at the following locations: Cx 6 (Neiguan), Sp8 (Diji), Liv3 (Taichong), Gv20 (Baihui), S29 (Guilai) before embryo transfer; S36 (Zusanli), Sp6 (Sanyinjiao), Sp10 (Xuehai), Li4 (Hegu) after embryo transfer. After 10 min the needles were rotated in order to maintain Deqi sensation. Additionally we used small stainless needles (0.2 x 13 mm) for auricular

acupuncture at the following points without rotation: ear point 55 (shenmen), ear point 58 (Zhigong), ear point 22 (Neifenmi), ear point 34 (Naodian). In the control group (n=69) embryos were transferred without any supportive therapy. Just before and after embryo transfer all patients underwent ultrasound scans of a sagittal uterine plane using a 7 MHz transvaginal probe (LOGIQ 400 PRO, GE Medical Systems). A sequence of two minutes was video recorded. For evaluation of uterine contractions the videotape was visually assessed in a fivefold speed. The total time of endometrial movements during the 40 s period of accelerated reproduction was measured. The main outcome measure was the change of uterine motility after embryo transfer. For statistical evaluation of endometrial motility t-test was used.

Results: The basic uterine motility before embryo transfer did not differ between acupuncture group and control group: 19.0 vs 20.1s (p=0.53). Comparing the endometrial motility before and after embryo transfer we failed to find a significant change by acupuncture treatment: acupuncture group vs control group 2.6s ± 11.0s vs 2.3s ± 9.3s (t-test: p=0.84).

Conclusion: Acupuncture treatment does not inhibit uterine motility. Other mechanisms may be responsible for the increase of pregnancy rate after acupuncture treatment in ART.

### P-34

#### The use of transdermal heat to relieve pain post-oocyte retrieval. Paul A. Robb, Jared C. Robins, Sharon Petty, Michael A. Thomas. Univ of Cincinnati, Cincinnati, OH; Procter & Gamble, Cincinnati, OH.

Objective: To evaluate the efficacy of a transdermal heating device compared to oral analgesics for the treatment of pain after IVF oocyte retrieval.

Design: A prospective trial was conducted on seventeen women undergoing their first oocyte retrieval after IVF stimulation randomized to either a transdermal heating device, or acetaminophen.

Materials and Methods: Women, undergoing their first oocyte retrieval after IVF stimulation, were randomized to either a transdermal heating device (ThermaCare™, Procter & Gamble, Cincinnati, OH) or acetaminophen for post-procedure pain relief. The ThermaCare™ device was placed on the lower abdomen from noon until 8 pm on the day before the retrieval, at 1 hour after the retrieval for 8 hours, and from noon until 8pm on the day after the retrieval. Patients in the acetaminophen group took 1000mg of acetaminophen 1 hour post-retrieval and were allowed 500-1000 mg of acetaminophen every 4 hours prn. Subjects were asked to complete a 101-point pain numerical rating of their pain four times a day beginning the day before the retrieval until two days after the retrieval. A 6-point pain relief score was performed to standardize patient's perception of the effect of intervention. This was completed at 1, 2, 4, and 8 hours after intervention on the day of retrieval, and upon rising and at noon, 4pm and 8pm the day after retrieval. Groups were compared using the Kruskal-Wallis test and curvilinear regression.

Results: At present, 17 of a planned 20 patients have completed the trial. Patients taking acetaminophen had significantly less pain on the day of retrieval and the first day after retrieval (p <0.05). Pain scores were not significantly different on the second day after retrieval. With acetaminophen, the subjects' pain was relieved by approximately 50% within 1 hour. ThermaCare™ significantly, but more gradually, relieved pain over time reaching about 50% pain relief by 4 hours. When comparing pain relief from ThermaCare™ to acetaminophen, ThermaCare™ was approximately 50% effective after 1 day's application and 75% effective after 2 day's application.

Conclusions: Patients undergoing IVF retrieval experienced relief of post-operative pain with either acetaminophen or transdermal heat. Oral analgesia with acetaminophen had a more pronounced effect in decreasing pain intensity and increasing the perception of pain relief. Whether or not the addition of transdermal heat would have a positive synergistic effect on pain relief with acetaminophen needs to be determined.

### P-35

#### The effect of hydrosalpinx on IVF outcome: A prospective, randomised controlled trial of vaginal ultrasound-guided hydrosalpinx aspiration during egg collection. Nahed Hammadih, Masoud Afnan, Khaldoun Sharif, Janet Evans, Nazar Amso. Cardiff Assisted Reproduction Unit,