EMBRYO TRANSFER

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WUSE DISTRICT HOSPITAL
ABUJA NIGERIA
LEARNING OBJECTIVES

• INTRODUCTION
• HISTORY
• PRE EVALUATION
• PROCEDURE
• ESET VS DET
• COMPLICATIONS
• EVIDENCE BASED PRACTICE
• CONCLUSION
INTRODUCTION

• FINAL AND MOST CRITICAL STEP IN IVF - MARR OR MAKE THE ENTIRE PROCESS

• PHYSICIAN CAN RUIN EVERYTHING WITH A CARELESSLY PERFORMED EMBRYO TRANSFER.

• PROCESS OF AR IN WHICH EMBRYOS ARE PLACED INTO THE UTERUS OF A FEMALE WITH THE INTENT TO ESTABLISH A PREGNANCY
HISTORY

• **MYTHOLOGY - 15TH CENTURY**

• **MAMMALIAN (RABBIT) EMBRYOS (HEAPE 1891)**

• **IVF/ET RECURRED IN THE 1960S (ROBERT EDWARDS)**

• **FIRST IVF BABY (STEPTOE AND EDWARDS, 1978).**

• **OVER 5 MILLION BABIES**
PRE EVALUATION

• MOST EXPERIENCED INFERTILITY EXPERT
• COLLABORATION BETWEEN THE EMBRYOLOGIST AND FERTILITY EXPERT
• UTERINE EVALUATION (UTERINE DEPTH AND PATHOLOGIES) AND PREPARATION
• SUCCESSFUL TRANSFER – EMBRYO QUALITY, TRANSFER TECHNIQUE, ENDOMETRIAL RECEPTIVITY
• REVIEW OF PRIOR MOCK OR PT NOTES FOR DIFFICULTY LEVEL AND TIPS FOR GUIDANCE
• IDENTIFICATION AND MATCHING OF PT WITH EMBRYO
• TIMING
PROCEDURE

EMBRYO SELECTION

EMBRYO LOADING

Timing of Embryo Transfer

Day 3 Embryo Transfer
Day 5–6 Embryo Transfer
"Blastocyst Transfer"

Embryo Transfer

CATHETER LOADING FOR EMBRYO TRANSFER

- Media
- Embryos
- Air Pockets
OR REQUIREMENT

- ASEPTIC PROCEDURE
- SPECULUM
- EMBRYO TRANSFER CATHETER
  - IDEAL – SOFT ENOUGH TO AVOID TRAUMA
  - MALLEABLE ENOUGH TO PASS THROUGH WITHOUT MUCH TRAUMA
EMBRYO TRANSFER CATHETER

• EASY TRANSFER
  • THE TRIAL EMBRYO TRANSFER CATHETER NEGOTIATES THE ENDOCERVIX EASILY.
  • PATIENT DOESN’T FEEL ANY PAIN THROUGHOUT THE PROCEDURE.
  • FRYDMAN EMBRYO TRANSFER CATHETER, ROCKET SOFT EMBRYO TRANSFER SET, WALLACE EMBRYO TRANSFER CATHETER

• DIFFICULT TRANSFER
  • THE TRIAL EMBRYO TRANSFER CATHETER DOESN'T GO INTO THE ENDOCERVIX EASILY.
  • HARD TIME PLACING THE CATHETER INTO THE UTERUS.
  • PAIN THROUGHOUT THE PROCEDURE.
  • ACUTELY ANTEVERTED OR RETROVERTED UTERUS OR CERVICAL STENOSIS
  • LABOTECT EMBRYO TRANSFER SET, FRYDMAN SOFT 4,5 WITH GUIDELINE, WALLACE EMBRYO TRANSFER WITH STILET, GYNETICS TULIPS SET, COOK SIVF 7019
STEPS FOR EMBRYO TRANSFER

• PREPARE PT FOR PROCEDURE – COUNSELLING, PAIN MNGT (SEDATION/DRUGS)

• VAGINAL SPECULUM TO VISUALIZE THE CERVIX WITH PT IN LITHOTOMY

• TRANSABD SCAN – ENDOOMETRIAL CAVITY, GUIDE DURING TRANSFER

• SOFT TRANSFER CATHETER LOADED WITH THE EMBRYOS AND HANDED TO THE CLINICIAN AFTER CONFIRMATION OF THE PATIENT’S IDENTITY.
STEPS (CONTD)

• CATHETER INSERTED THROUGH THE CERVICAL CANAL AND ADVANCED INTO THE UTERINE CAVITY. TECHNIQUES – DIRECT TRANSFER (27%), TRIAL FFED BY TRANSFER (40%), AFTERLOAD TRANSFER (31%)

• CORRECT CATHETER PLACEMENT - 1–2 CM FROM THE UTERINE FUNDUS

• EMBRYO EXPULSION AND CATHETER WITHDRAWAL. (0,5-10,30SECS – 31%,33%,22%). RPT IMMEDIATELY IF EMBRYO IS RETAINED.

• CATHETER HANDED TO THE EMBRYOLOGIST - RETAINED EMBRYO
FACTORS LIMITING EMBRYO TRANSFER

- Singleton pregnancy is safest and prefer that only one fetus actually implants
- Access to public funding for ART
- Availability of good cryopreservation facilities
- Effective education about the risks of multiple pregnancy
- Legislation for regional usage of single embryo transfer
- Personal choice - Subfertile couples have a strong preference for twins
- Couples fear failing IVF more than they fear the risks of twins,
COMPARISON OF ESET TO DET

<table>
<thead>
<tr>
<th>elective – SET or SBT</th>
<th>Double ET or 2BT</th>
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<tbody>
<tr>
<td>Reduced risk of multiple pregnancy (twin rate 2 -3.5%)</td>
<td>Increased risk of multiple pregnancy (25 - 38%)</td>
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<tr>
<td>Pregnancy rate is comparable</td>
<td>Pregnancy rate is comparable</td>
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<tr>
<td>Cumulative birth rates</td>
<td>Comparable birth rates</td>
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<tr>
<td>Better outcomes – mean GA @ delivery, mode of delivery, birth weight</td>
<td>Outcome is ass with risks ass with multiple gestation</td>
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<tr>
<td>Reduced risk of need for neonatal ICU</td>
<td>Increase need for NICU</td>
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<td>Highest is Sweden (69.4%)</td>
<td>Highest in US</td>
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<td>Improved outcome with embryo cryopreservation</td>
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SET

- Women under 36 years going through a first in vitro fertilization (IVF) cycle or with no previous failed IVF cycles
- Surplus embryos for freezing
- Quality of embryos, particularly development of an embryo to day 5 after fertilization ("blastocyst")
- High risk patients irrespective of age where avoiding multiple pregnancy is paramount, e.g., uterine anomalies
### NICE GUIDELINE

<table>
<thead>
<tr>
<th>Age</th>
<th>Attempt No.</th>
<th>Embryos transferred</th>
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<tbody>
<tr>
<td>&lt;37 yrs</td>
<td>1st</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>2nd</td>
<td>1 if top quality</td>
</tr>
<tr>
<td></td>
<td>3rd</td>
<td>No more than 2</td>
</tr>
<tr>
<td>37 – 39 years</td>
<td>1&lt;sup&gt;st&lt;/sup&gt; and 2&lt;sup&gt;nd&lt;/sup&gt;</td>
<td>1 if top quality 2 if no top quality</td>
</tr>
<tr>
<td></td>
<td>3rd</td>
<td>No more than 2</td>
</tr>
<tr>
<td>-42 years</td>
<td></td>
<td>2</td>
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### ASRM GUIDELINE

<table>
<thead>
<tr>
<th>Age (yrs)</th>
<th>Prognosis</th>
<th>Cleavage-stage embryo</th>
<th>Blastocysts</th>
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<tbody>
<tr>
<td>&lt;35</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>35-37</td>
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<tr>
<td>38-40</td>
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<tr>
<td>41-42</td>
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#### Cleavage-stage embryo
- **euploid**
  - 1
  - 1
  - 1
  - 1
- **other favourables**
  - 1
  - 1
  - ≤3
  - ≤4
- **all others**
  - ≤2
  - ≤3
  - ≤4
  - ≤5

#### Blastocysts
- **euploid**
  - 1
  - 1
  - 1
  - 1
- **Other favourables**
  - 1
  - 1
  - ≤2
  - ≤3
- **All others**
  - ≤2
  - ≤2
  - ≤3
  - ≤3

ASRM. Limits on number of embryos to transfer. Fertil Steril 2017.

Other favorable - Any ONE of these criteria:
- **Fresh cycle**: expectation of 1 or more high quality embryos available for cryopreservation, or previous live birth after an IVF cycle;
- **FET cycle**: availability of vitrified day-5 or day-6 blastocysts, euploid embryos, 1st FET cycle, or previous live birth after an IVF cycle.
EVIDENCE BASED PRACTICE

- USS-GUIDED ET – GOOD EVIDENCE

- AVOID TRANSFER DIFFICULTIES (SALLAM, FERTIL STERIL 2003)

- ENSURE PROPER PLACEMENT

- MINIMISES CONTAMINATION WITH BLOOD (DASIG, FERTILITY STERIL 2011)

- REDUCES RISK OF SUBENDOMETRIAL IMPLANTATION

- REDUCES UTERINE CONTRACTION STIMULATION (ZHU, HUMAN REP. 2014)
EBP (CONT'D)

• TRIAL TRANSFERS – LIMITED EVIDENCE. CERVICAL STENOSIS (GOOD EVIDENCE – GLATSEN, SERHAL)

• IDEAL CATHETER PLACEMENT – GOOD EVIDENCE. (ECHO – TIP CATHETER)

• LOCATION OF THE EMBRYO CATHETER GUIDE BEFORE THE INTERNAL CERVICAL OS (ABDELMASSAH F&S 2007)

• 20-30UL OF FLUID MEDIA DURING TRANSFER

• CATHETER DURATION IN UTERO POST EXPULSION - NO EFFECT ON PREGNANCY RATES. (GRYGORUK F&S 2011)

NUMBER OF EMBRYOS TO BE TRANSFERRED (ETHICAL ISSUES)

ADVANTAGES OF DAY 3 CF DAY 5 EMBRYO TRANSFER

EBP (CONTD)

• BED REST / PHYSICAL ACTIVITY POST TRANSFER – LIMITED EVIDENCE (FERTILE STERIL 2007)

• USE OF MECHANICAL CLOSURE OF THE CERVICAL CANAL

• USE HYALURONIC ACID AS ADHERENCE MEDIUM FOR THE EMBRYO (GOOD EVIDENCE – BONTEKOE, 2015)

• FULL BLADDER, (ABOU-SETTA, 2007)

• REMOVAL OF CERVICAL MUCUS, OR FLUSHING OF THE ENDOMETRIAL OR ENDOCERVICAL CAVITY AT THE TIME OF EMBRYO TRANSFER

• ADJUNCTIVE ANTIBIOTICS IN THE FORM OF AMOXICILLIN PLUS CLAVULANIC ACID DOES NOT INCREASE THE CLINICAL PREGNANCY RATE (BROOK N ET AL, 2006)
ENDOMETRIAL PREPARATION

• NC (EARLY GRP) – VAGINAL PROGESTERONE AFTER LH SURGE
  (LATE GRP) – VAGINAL PROGESTERONE + RHCG (RPT AFTER 4 DAYS)
• MODIFIED NC
  - START OESTROGEN DAY 2/3
  - ADD PROGESTERONE @ ENDOMETRIAL THICKNESS >8MM

• VAGINAL AND IM PROGESTERONE RESULT IN EQUIVALENT PR
• FET AFTER 5 OR 6 POST PROGESTERONE RESULT IN HIGHER PR THAN DAY 7
  (COCHRANE DATABASE SYS REVIEW 2010)
COMPLICATIONS

• LOSS OF EMBRYO DURING TRANSFER
• IMPLANTING IN THE WRONG PLACE (FT, CERVIX)
• CRAMPING OR PAIN
• MILD VAGINAL BLEEDING
TAKE HOME MESSAGE

• USS GUIDED TRANSFER IS ESSENTIAL FOR ATRAUMATIC TRANSFER WHICH IS KEY FOR IVF SUCCESS
• SOFT CATHETER HELP IN PROPER CATHETER PLACEMENT AND EMBRYO DELIVERY
• FROZEN SINGLE EMBRYO WITH WELL PREPARED ENDOMETRIUM SHOULD BE THE STANDARD OF CARE
• GOVT FUNDING WILL INCREASE UPTAKE OF ESET WITH REDUCTION IN THE RISK OF MULTIPLE PREGNANCY
THANK YOU
REFERENCES


• JAIN J (25 MARCH 2015). "EMBRYO TRANSFER". JOHN JAIN ON YOUTUBE. RETRIEVED 17 DECEMBER 2015


• FERTILITY: ASSESSMENT AND TREATMENT FOR PEOPLE WITH FERTILITY PROBLEMS. NICE CLINICAL GUIDELINE CG156 - ISSUED: FEBRUARY 2013