

Endometrial Assessment in the Prediction of Pregnancy Outcome after Embryo Transfer

Thesis

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Glossary of Terms

ART	Assisted Reproductive Technology
ASAs	Antisperm Antibodies
BMPs	Bone Morphogenetic Proteins
BTEB1	Basic Transcription Element-Binding Protein 1
CDK	Cyclin Dependent Kinase
DEDD	Domain-Containing Protein
EMJ	Endometrial-Myometrial Junction
EPDA	Intraendometrial Power Doppler Area
FET	Frozen-Thawed Embryo Transfer
FI	Flow Index
Foxa2	Forkhead Box A2
HB-EGF	Heparin-Binding Epidermal Growth Factor
hCG	Human Chorionic Gonadotropin
Hmx3	Homeobox 3
Hoxa	Homeobox A
Hurp	Hepatoma Upregulated Protein
ICSI	Intra-Cytoplasmic Sperm Injection
IGF	Insulin-Like Growth Factor
IHH	Indian Hedgehog
IL-11R α	Interleukine-11 Receptor A
IUAs	Intrauterine Adhesions
IUI	Intrauterine Insemination
IVF	In-Vitro Fertilization
IVF-ET	In-Vitro Fertilization And Embryo Transfer

MR	Magnetic Resonance
NPV	Negative Predictive Value
OHSS	Ovarian Hyperstimulation Syndrome
PCOS	Polycystic Ovarian Syndrome
PDZ	Primary Decidual Zone
PI	Pulsatility Index
PPV	Positive Predictive Value
PZD	Partial Zona Dissection
RI	Resistance Index
ROC	Receiver-Operating Characteristic
ROI	Region-Of- Interest
SDZ	Secondary Decidual Zone
SNP	Single Nucleotide Polymorphism
SRC	Steroid Receptor Coactivator
STAT	Signal Transducer And Activator Of Transcription
TGF- β	Transforming Growth Factor- B
VEGF	Vascular Endothelial Growth Factor
VFI	Vascularisation Flow Index
VI	Vascularisation Index
VOCAL	Virtual Organ Computer-Aided Analysis
ZD	Zona Drilling

Alphabetically ordered.

Introduction

Embryo implantation depends on the quality of the ovum and endometrial receptivity. Endometrial receptivity is a temporally unique sequence of factors that make the endometrium receptive to embryonic implantation. Implantation window is a period during which the endometrium is optimally receptive to implanting blastocyst (Aboubakr et al., 2004).

Observations suggest that prospective assessment of the quality of decidualization response in the endometrium may be an important tool for predicting the likelihood of successful implantation and pregnancy outcome. Since its introduction into the clinic, ultrasound has been used widely to assess uterine features such as endometrial thickness, endometrial pattern and uterine blood flow that may be predictive of pregnancy, especially in the context of assisted reproductive technology (Abdallah et al., 2012).

A thin endometrium is one of the most difficult problems encountered in assisted reproduction every day practice. Whether a daily dose of 150 IU HCG for 7 days concomitant with estrogen administration in estrogen replacement cycles can increase the endometrial thickness and improve pregnancy outcome (Papanikolaou et al., 2013).

Precise and specific endometrial maturational development is crucial in allowing implantation following assisted reproduction. As endometrial biopsy is invasive and hormonal milieu assessment inaccurate, the need to evaluate endometrial development encouraged the use of high-resolution ultrasonography as an alternative non-invasive method of assessment for uterine receptivity. Ultrasonographic endometrial thickness measurement, endometrial pattern investigation, endometrial volume computation, uterine and subendometrial blood flow analysis by Doppler sonography are just some of the methods that we can utilize to have an idea of uterine receptivity and consequently to better predict pregnancy outcome following assisted reproductive technology cycles (Senturk and Erel, 2008).

Endometrial receptivity plays a crucial role in the establishment of a healthy pregnancy in cycles of assisted reproduction. The endometrium as a key factor during reproduction can be assessed in multiple ways, most commonly through transvaginal grey-scale or 3-D ultrasound. It has been shown that controlled ovarian hyperstimulation has a great impact on the uterine lining, which leads to different study results for the predictive value of endometrial factors measured on different cycle days. There is no clear consensus on whether endometrial factors are appropriate to predict treatment outcome and if so, which one is suited best (Heger et al., 2012).

There is a correlation between endometrial thickness measured on hCG day and clinical outcome in normal responders with GnRH antagonist administration. The pregnancy rate was lower in patients with endometrial thickness less than 7 mm compared with patients with endometrial thickness more than 7 mm (Wu et al., 2014).

Aim of the Work

To evaluate the Endometrial thickness and pattern as predictors of the ICSI success rate after Embyo Transfer.

Study question: In a woman undergoing ICSI, do the endometrial thickness and pattern affect the outcome?

Study hypothesis:

Null hypothesis: In a woman undergoing ICSI or ART, the endometrial thickness and pattern may affect the success rate after ET.

Alternate hypothesis: No effect.