Serum Anti-mullerian Hormone, Serum Inhibin B and Antral Follicle Count for Prediction of ovarian Reserve in Patients Undergoing Intracytoplasmic Sperm Injection

Thesis

Submitted for partial fulfillment of the Master Degree
in Obstetrics and Gynecology

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2017

سورة البقرة الآية: ٣٢

Acknowledgments

First and foremost, I feel always indebted to Allah, the Most Beneficent and Merciful. I can do nothing without Him.

I would like to express my deep thanks and appreciation to **Prof. Mohamed Aly Mohamed Ibrahim,** *Professor of Obstetrics and Gynecology, Faculty of Medicine – Ain Shams University, who delivered me on 29/7/1989 at Abdel Kader Fahmy Hospital and for his outstanding help, valuable instructions constant support and close supervision through revising each part of the thesis. I really have the honor to complete this work under his great supervision.*

My deep gratitude goes to **Assistant Prof., Dr. Tarek Aly Raafat,** *Assistant Professor of Obstetrics and Gynecology, Faculty of Medicine – Ain Shams University, for his great support, tireless guidance and meticulous supervision throughout this work.*

I am truly grateful to **Dr. Ahmed Mahmoud Ahmed Hussein,** *for their sincere effort and close supervision through revising each part of the thesis.*

Also I would like to express a lot of thanks and appreciation to **Prof. Kamel Soliman Hammad,** *Professor of Clinical Pathology, Faculty of Medicine, Al-Azhar University for his cooperation in the clinical part of this thesis.*

Also I would like also to thank with all appreciation **Prof. Sameh Michil,** *for his role in the statistical part of this work.*

I would like to express my thanks to ***all patients*** *for their willing cooperation.*

A special acknowledgment is directed to ***all doctors and nurses at Ain Shams Maternity Hospital****, for their cooperation and help.*

Finally*, I wish to express all my feelings of love and appreciation to* ***my lovely family*** *who give me never ending support, understanding, love and care throughout my graduate study.*

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List of Abbreviations

Abbr.	Full-term
AFC	Antral Follicular Count
AMH	anti-Müllerian hormone
ART	Assisted Reproductive Technique
ASRM	American Society For Reproductive Medicine
AUC	Area Under the Curve
AUROC	Area Under the Receiver Operating Characteristics curve
BMI	Body Mass Index
Camp	Cyclic AMP
CC	Clomiphene Citrate
CCCT	Clomiphene Citrate Challenge Test
CEA	Cost-Effectiveness Analysis
CGH	Comparative Genomic Hybridization
CI	Confidence Interval
CO2	Carbon Dioxide
COH	Controlled Ovarian Hyperstimulation
COS	Controlled Ovarian Stimulation
CP	Clinical Pregnancy
CTET	Clinical Touch Embryo Transfer
CV	Coefficient of Variation
DET	Double Embryo Transfer
DHEAS	Dehydroepiandrosterone Sulfate
DOR	Diminished Ovarian Reserve
E2	Estradiol
EFFORT	Exogenous FSH Ovarian Reserve Test
ELISA	Enzyme Linked Immunosorbent Assays
ESHRE	European Society of Human Reproduction and Embryology
ET	Embryo Transfer
FDA	Food and Drug Administration
FET	Frozen-Thawed Embryo Transfer

FISH	fluorescent in situ hybridization
FSH	Follicle-Stimulating Hormone
FSHR	Follicle-Stimulating Hormone Receptor
GAST	Gonadotropin Analogue Stimulation Test
GH	Growth Hormone
GIFT	Gamete Intrafallopian Transfer
GnRH	Gonadotropin-Releasing Hormone
GnRHa	Gonadotropin-Releasing Hormone Agonist
GV	Germinal Vesicle
Hcg	Human Chorionic Gonadotropin
HIV	Human Immunodeficiency Virus
HMG	Human Menopausal Gonadotropin
HR	High Ovarian Response
ICSI	Intracytoplasmic Sperm Injection
IGFBP-1	Insulin-Like Growth Factor-Binding Protein-1
IL	Interleukin
IM	Intramuscular Injection
IMSI	Intracytoplasmic Morphologically Selected Sperm Injection
IQC	Internal Quality Control
IR	Implantation Rate
IV	Intravenous Injection
IVF	In Vitro Fertilization
LBR	Live Birth Rate
LH	Luteinizing hormone
MESA	Microsurgical Epididymal Sperm Aspiration
MI	First Mitotic Division
MIF	Mullerian Inhibiting Factor
MIH	Mullerian Inhibiting Hormone
MIS	Mullerian Inhibiting Substance
MOV	Mean Ovarian Volume
MII	Second Mitotic Division
NC	Naturally Conceived
NT	Nuchal Translucency
OB/GYN	Obstetrics and Gynecology
OBF	Ovarian Blood Flow

OHSS	Ovarian Hyperstimulation Syndrome
OPU	Ovum Pick Up
OR	Ovarian Reserve
ORT	Ovarian Reserve Test
OST	Ovarian Stimulation Test
OV	Ovarian Volume
PAPP-A	Pregnancy-Associated Plasma Protein A
PB	Polar Body
PCOS	Polycystic Ovary Syndrome
PESA	Percutaneous Epidydimal Sperm Aspiration
P-value	Probability of finding value
PZD	Partial zona dissection
ROC	Receiver Operating Characteristic
ROH	Greek letter of measure of rank correlation
RPM	Revolutions Per Minute
SC	Subcutaneous Injection
SD	Standard Deviation
SET	Single Embryo Transfer
SUZI	Subzonal Insemination
TESA	Testicular Sperm Aspiration
TESE	Testicular Sperm Extraction
TET	Tubal Embryo Transfer
TGF	Transforming Growth Factor
TMB	Tetramethylbenzidine
TNF	Tumor Necrosis Factor
TSH	Thyroid Stimulating Hormone
TVU	Transvaginal Ultrasound
UGET	Ultrasound Guided Embryo Transefer
US	Ultrasound
WHO	World Health Organization
ZIFT	Zygote Intrafallopian Transfer

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Abstract

Background: Intracytoplasmic sperm injection (ICSI) is an in vitro fertilization procedure in which a single sperm is injected directly into an oocyte.**Objective:** Aim of the Work: The aim of the study is to determine the valueofAnti-Mullerianhormone (AMH), Inhibin-B and Antral follicle count as markers for ovarian responsein patients undergoing to Intra cytoplasmic sperm injection cycles**. Methods**:This observational prospective study was conducted at Ain Shams University Maternity Hospital, at ART (Assisted Reproductive Technique) unit on a sample of 100 women aged between 25 and 35 years, was enrolled for intracytoplasmic sperm injection (ICSI).**Results:**a good correlation between inhibin B and other numerical variables. There was strong positive correlation between inhibin B and AMH (rho, .727; p-value <.001) and strong negative correlation between inhibin B and both FSH (rho, -.674; p-value <.001) and LH (rho, -.608; p-value <.001) Inhibin B correlated moderately negatively with age (rho, -.449; p-value <.001) and moderately positively with AFC (rho, .407; p-value <.001), number of collected oocytes (rho, .444; p-value <.001) and number of sacs (rho, .514; p-value <.001). Inhibin B correlated positivelywith the number of fertilized oocytes (rho, .385; p-value <.001) and number of grade 1 embryos (rho, .355; p-value <.001). As regard pregnancy rate in the present study, the good-response group had significantly higher chemical and clinical pregnancy rates (76% versus 0%, p-value <.001 and 71% versus 0%, p-value <.001, respectively), as there was no chemical or clinical pregnancy had occurred in poorresponders **Conclusion:** AFC, AMH and Inhibin B are effective in predicting the ovarian reserve as well as the response to induction, and bothAMH and AFC are accurate for the assessment of ovarian reserve. Recommendations:A Larger scale studies including higher number of patients over longer periods of time are needed to verify the validity of this parameter as a marker of ovarian reserve in patients undergoing ICSI.

Key words: anti-Mullerian hormone, serum inhibin B, antral follicle count, ovarian reserve, ICSI

Introduction

Infertility is a disease of the reproductive system defined by the failure to achieve a clinical pregnancy after 12 months or more of regular unprotected sexual intercourse ***(Zegers et al., 2009).***

In vitro fertilization is the technique of letting fertilization of the male and female gametes (sperm and egg) occur outside the female body ***(Van Voorhis et al., 2007).***

Intracytoplasmic sperm injection (ICSI) is an in vitro fertilization procedure in which a single sperm is injected directly into an oocyte. This procedure is most commonly used to overcome male infertility problems, although it may also be used where eggs cannot easily be penetrated by sperm and occasionally in addition to sperm donation ***(Boulet et al., 2015).***

The determination of ovarian reserve is important in the assessment and treatment of infertility. Ovarian reserve also refers to the number and quality of oocytes available to produce a dominant follicle late in the follicular phase of the menstrual cycle at any given age. The prediction of IVF success is possible after better estimation of ovarian reserve ***(Freour et al., 2006).***