

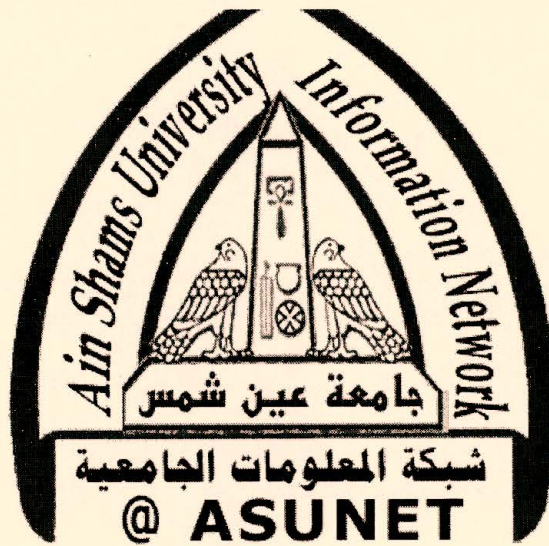


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**The Value of Transvaginal Ultrasonographic
Ovarian Morphology and Insulin Resistance in the
Prediction of Clomiphene Citrate Response in
Obese Women with Polycystic Ovaries**

Thesis

Submitted to Benha Faculty of Medicine

In partial Fulfillment of the requirements of the
M.Sc. degree In Obstetrics & Gynecology.

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2005

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YANI

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## *List of Abbreviations*

|                      |                                                       |
|----------------------|-------------------------------------------------------|
| <b>μl</b>            | : Microliter                                          |
| <b>μU</b>            | : Microunity                                          |
| <b>A</b>             | : Androstenedione                                     |
| <b>ACOG</b>          | : American College of Obstetricians and gynecologists |
| <b>ACTH</b>          | : Adrenocorticotrophic hormone                        |
| <b>ASD</b>           | : Androstenedione                                     |
| <b>ASRM</b>          | : American Society of Reproductive Medicine           |
| <b>BMI</b>           | : Body mass index                                     |
| <b>CC</b>            | : Clomiphene citrate                                  |
| <b>cm</b>            | : Centimeter                                          |
| <b>CR</b>            | : Clomiphene responders                               |
| <b>CRA</b>           | : Clomiphene resistance anovulation                   |
| <b>CYP11α</b>        | : The cholesterol side chain cleavage gene            |
| <b>CYP17</b>         | : The 17-hydroxylase/17, 20 lyase gene                |
| <b>dL</b>            | : Deciliter                                           |
| <b>DHEA</b>          | : Dehydroepiandrosterone                              |
| <b>DHEA-S</b>        | : Dehydroepiandrosterone sulfate                      |
| <b>Ds</b>            | : Days                                                |
| <b>E</b>             | : Enclomiphene isomer                                 |
| <b>E<sub>2</sub></b> | : Estradiol                                           |
| <b>FAI</b>           | : Free androgen index                                 |
| <b>Fig</b>           | : Figure                                              |
| <b>FSH</b>           | : Follicular stimulating hormone                      |
| <b>G/I</b>           | : Glucose / Insulin ratio                             |
| <b>GH</b>            | : Growth hormone                                      |
| <b>GnRH</b>          | : Gonadotropin releasing hormone                      |
| <b>Gp</b>            | : Group                                               |
| <b>IGF-1</b>         | : Insulin-like Growth Factor-1                        |
| <b>IGF-2</b>         | : Insulin-like Growth Factor-2                        |
| <b>IGFBP-1</b>       | : Insulin-like Growth Factor Binding Protein-1        |
| <b>INS</b>           | : Insulin                                             |
| <b>IR</b>            | : Insulin resistance                                  |
| <b>IU</b>            | : International unit                                  |

|             |                                      |
|-------------|--------------------------------------|
| <b>L</b>    | : Liter                              |
| <b>LH</b>   | : Luteinizing hormone                |
| <b>mg</b>   | : Milligram                          |
| <b>ml</b>   | : Milliliter                         |
| <b>N</b>    | : Numbers                            |
| <b>ng</b>   | : Nanogram                           |
| <b>NIH</b>  | : National Institute of Health       |
| <b>nmol</b> | : Nanomole                           |
| <b>NS</b>   | : Not significant                    |
| <b>OHSS</b> | : Ovarian hyper-stimulation syndrome |
| <b>P</b>    | : Progesterone                       |
| <b>PCO</b>  | : Polycystic ovaries                 |
| <b>PCOS</b> | : Polycystic ovary syndrome          |
| <b>S/A</b>  | : Stromal area / total ovarian area  |
| <b>SCC</b>  | : Side chain cleavage                |
| <b>SD</b>   | : Standard deviation                 |
| <b>SHBG</b> | : Sex hormone binding globulin       |
| <b>T</b>    | : Testosterone                       |
| <b>TH</b>   | : Tyrosine hydroxylase gene          |
| <b>TVS</b>  | : Transvaginal ultrasound            |
| <b>VNTR</b> | : Variable-number-tandem-repeat      |
| <b>Z</b>    | : Zuclomiphene isomer                |

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# INTRODUCTION

## Introduction

Polycystic ovary syndrome (PCOS) is a heterogeneous reproductive endocrine disorder, which is considered to be the commonest endocrine abnormalities of reproductive aged women (*Aziz et al.*, 2004). The heterogeneity of both the ovarian morphology and clinical finding in women with polycystic ovaries has been well recognized since Stein and Leventhal's first report and gradually led to the establishment of the term polycystic ovary syndrome (*Stien and Leventhal*, 1935).

PCOS can be diagnosed by the presence of two of the following three criteria, oligo-or anovulation, clinical or biochemical signs of hyperandrogenism, and polycystic ovaries (*ASRM*, 2004). With the advantage of technology, transvaginal ultrasound (TVS) is currently the gold standard for diagnosing polycystic ovaries. PCO was defined when there is 12 or more follicles in each ovary measuring 2 – 9 mm in diameter, and/or increased ovarian volume (>10ml) (*ASRM*, 2004). Other ultrasound criteria may include increased stromal echogenicity (*Buckett et al.*, 1999) and increased stromal area to the total ovarian area (S/A) (*Fulghesu et al.*, 2001).

Although the fundamental pathophysiologic defect in PCOS is not known, it seems that insulin resistance plays a central role (*Dunaif*, 1997). Insulin resistance leads to hyperinsulinaemia. Circulating concentrations of insulin and luteinizing hormone (LH) are generally raised. The theca cells, which envelop the follicle and produce androgens, are over-responsive to this stimulation. They increase in size and overproduce androgens. (*Dunaif*, 1997).

This combination of raised levels of androgens, insulin and LH explains the classic PCOS presentation of hirsutism, anovulation or dysfunctional bleeding, and dysfunction of glucose metabolism (*Sampson et al.*, 1996).