The Value of β-Human Chorionic Gonadotropin, Progesterone and CA-125 in Prediction of Outcome in Threatened Abortion.

Thesis

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Contents

List of Abbreviations

ACA   :   Anticardiolipin antibody

APS   :   Antiphospholipid Syndrome

DES   :   Di-ethyl stillbesterol

ECLIA   :   Electro Chemiluminescene Immunoassay

FSH   :   Follicle stimulating hormone

FVL   :   Factor v leiden

HCG   :   Human chorionic gonadotropin

HLAs   :   Human leukocyte antigens

LAC   :   Lupus Anticoagulant.

LH   :   Luteinizing hormone

NK   :   Natural Killer Cell

TSH   :   Thyroid Stimulating Hormone

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Introduction

Abortion is defined as expulsion of fetus or embryo from uterus prior to 20 weeks gestation or less than 500 grams birth weight *(Cunningham et al., 2005)*

Although the true incidence of spontaneous abortion is unknown, approximately 15% of clinically evident pregnancies end in spontaneous abortion *(Decherney et al., 2002)*

The common causes of spontaneous abortion are chromosomal abnormalities of the embryo/fetus, uterine anomalies, maternal endocrine or immune diseases, maternal thrombophilia, teratogens and mutagens. *(James et al., 2006)*

Threatened abortion is defined as: a pregnancy complicated by vaginal bleeding and/or uterine cramping before 20 weeks of gestation, occurs in up to 20% of early pregnancies**.** *(Griebel et al., 2005; Savitz et al., 2002).*

Although ultrasound examinations can be used to detect the presence or absence of fetal life, it was difficult to decide whether patients with symptoms of threatened miscarriage had a progressive pregnancy. Hormone determinations have frequently been found to be helpful in predicting early pregnancy outcomes. *(Barnhart et al., 2004; Phipps et al., 2000).*

Human chorionic gonadotrophin (HCG) is a glycoprotein composed of 237 amino acids, it is heterodimeric with an α and β subunits, It is well known that the main function of HCG is maintenance of corpus luteum during beginning of pregnancy causing it to secrete progesterone *(Kayisli et al., 2003).*

Due to structural similarity of α subunit of HCG and FSH, LH and TSH, it has been claimed that β HCG is superior

to HCG in diagnosis and monitoring of the trophoblastic diseases, in the screening of Down syndrome, and in diagnosis of some other malignancies *(Cole et al 2009; Evans et al 2007).*

Several studies conclude that a single β-HCG measurement in early pregnancy can reliably predict pregnancy outcome. *(Condous et al., 2005; Dumpsa et al., 2002).*

Also it is indicated in many studies that the value of progesterone is used in the differentiation of healthy pregnancies, ectopic pregnancies and other unhealthy pregnancies *(Bignardi et al., 2010; Al-Sebai et al., 1995).*

CA-125 (cancer antigen or carbohydrate antigen 125, also known as Mucin 16). is a glycoprotein with high molecular weight that can be detected in endocervix, endometrium, ovaries and epithelia of tubes and amnion *(Argüseo et al., 2009).*

Abortion risk is increased in pregnant women with higher CA-125 level *(Mandendag et al., 2009; Scarpellini et al., 1995).*

Although previous studies have suggested the relative power of progesterone and β-HCG determinations in the prediction of pregnancy outcome, these prognostic hormonal factors were mainly studied as single predictors. Studies on the association between hormone combined predictor and threatened miscarriage are limited. *(lijun et al., 2011; El Bishry et al., 2008; Phipps et al.,2000)*

Therefore, this study was to investigate the predictive power of maternal serum levels of progesterone, β-HCG and CA-125 each separately and in combination for prediction of the pregnancy outcome of threatened miscarriage.

Aim of the work

To investigate the predictive power of maternal serum levels of progesterone, β-HCG and CA-125 each separately and in combination for predicting the prognosis in cases of threatened abortion.

Abortion

Complications arise more frequently during the first trimester than at any other stage of pregnancy. Most patients have bleeding, pain, or both. Vaginal bleeding occurs in approximately 20% of clinically diagnosed pregnancies. It causes considerable anxiety for the woman and her partner. In most cases, no intervention will alter the outcome. The main aim of clinical management is a prompt, accurate diagnosis, with reassurance if the pregnancy is appropriately developed and viable, or appropriate intervention if not *(James et al., 2006) (Verhaegen et al.,2012).*

Most studies estimate that 15% to 20% of clinically recognized pregnancies end in Miscarriage (*Zinaman et al., 1996), (Mark et al., 2009).* More than 80 % of spontaneous abortions are in the first 12 weeks, at least half result from chromosomal anomalies. There also appears to be a 1.5 male : female gender ratio in early abortuses. After the first trimester, both the abortion rate and the incidence of chromosomal anomalies decrease *(Benirschke and Kaufmann., 2000).*

In past when family size was larger, the loss of a pregnancy, particularly in the first trimester, was often accorded less importance by society and the medical

profession. Now, with most couples having fewer children, the loss of an individual pregnancy or child has assumed greater significance. The understanding and appreciation of the psychological effects of early pregnancy loss have lagged behind that of perinatal bereavement *(Stirtzinger et al., 1989).*

However, there is now greater recognition of the psychological and psychiatric sequelae and the consequent need for support, these considerations should be taken into account in the management of couples who experience early pregnancy loss *(Frost et al., 1996)*

Definition of abortion (miscarriage):

Spontaneous abortion and miscarriage imply the natural loss of a pregnancy before viability. Until recently, the term *abortion* was generally used in professional communication and *miscarriage* was used in discussion with patients. However, because the term *abortion* (which many patients find offensive) has pejorative connotations of "elective termination of pregnancy," there has been an overall shift away from using *abortion* To describe the spontaneous loss of a pregnancy, Viability implies the ability of the fetus to survive extrauterine life. *(James et al., 2006).*

In the United Kingdom, the legal definition changed in 1992 to 24 weeks' gestation, whereas in North America, the

gestational age limit for a miscarriage is 20 weeks *(Norwitz et al., 2001).*

A pregnancy loss may be clinically evident after a patient has bleeding or pain or may be clinically silent and identified on a routine ultrasound scan. The introduction of nearly routine scanning to confirm gestational dates has had a dramatic effect on the management of early pregnancy loss. Bleeding occurs in one fifth of recognized pregnancies before the 20th week of gestation*. (Chard, 1991), (Macklon et al., 2002).*

Incidence of spontaneous abortion:

The prevalence of spontaneous abortion varies according to diligence used in its identification, For example**,** *(Wilcox et al.,1988)* studied 221 healthy women through 707 menstrual cycles. They found that 31 % of pregnancies were lost after implantation, A number of factors influence the spontaneous abortion rate, but it is not known at this time if those that are clinically silent are affected by some of these. For example, clinically apparent miscarriage increases with parity as well as with maternal and paternal age, the frequency doubles from 12% in women younger than 20 years to 26 % in those older than 40 years. For the same comparison of paternal ages, the frequency increases from 12 to 20 %. But again, it is