Biochemical Versus ultrasound findings as predictors of fetal loss in cases of first trimester threatened miscarriage

Thesis

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Amany Abd El-monem Mahmoud

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List of Abbreviations

Abbr.	Full-term
aCL	**:** anticardiolipin
ACOG	**:** American Collage for Obstetricians and Gynecologists
ANOVA	**:** Analysis of variance
aPL	**:** Anti-phospholipid antibodies
AUC	**:** Area under the curve
AUROC	**:** Area Under the ROC curve
BMI	**:** Body mass index
BPD	**:** Biparietal diameter
bpm	**:** beats per minute
CA125	**:** Cancer antigen 125
CGH	**:** Comparative genomic hybridization
CI	**:** Confidence interval
CRL	**:** Crown-rump length
EPAS	**:** Early pregnancy assessment service
ESHRE	**:** European Society of Human Reproduction and Embryology
FHR	**:** Fetal heart rate
FL	**:** Femur length
GA	**:** Gestational age
GSD	**:** Gestational sac diameter
GTG	**:** Green top guide lines

hCG : Human chorionic gonadotropin

EHR : Embryonic heart rate

IL : Interleukin

IUP : Intra uterine pregnancy

IVF : In-vitro fertilization

LA : Lupus anticoagulant

LH : Luteinizing hormone

NICE : National Institute for Health and Care Excellence

NK : Natural killer

PPV : Positive predictive value

P : Progesterone

PAPP-A :Pregnancy associated Plasma protein A

PCOS : Polycystic ovarian syndrome

PUL : Pregnancy of unknown location

RBC : Red blood cells

RM : Recurrent miscarriage

ROC : Receiver Operating Characteristic

RPAH : Royal Prince Alfred Hospital (RPAH

RPL : Recurrent pregnancy loss

RSA : Recurrent spontaneous abortion

SD : Standard deviation

SDF : Sperm DNA fragmentation

SPSS : Statistical package for social science

Th : T-helper

TPO-Ab : Thyroperoxidase antibody

TSH **:** Thyroid stimulating hormone

TVS **:** Transvaginal ultrasound

US **:** Ultrasound

YS **:** Yolk sac

YSD **:** Yolk sac diameter

β2GP1 **:** Beta 2 glycoprotein-1antibody

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ABSTRACT

Objective: To evaluate the accuracy of ultrasound findings in comparison to serum CA125and progesterone in predicting fetal demise in cases of first trimester threatened miscarriage**.**

Setting: Ain Shams University Maternity hospital**.**

Patients and Methods: A total of 42 pregnant women between 6- and 8-weeks' gestation were assessed for eligibility and divided into two groups: Group I: 29 cases who completed the 1st trimester of pregnancy. Group II: 13 cases who failed to complete the 1st trimester of pregnancy.

Results: The incidence of miscarriage was 30%. Women who miscarried and those who continued their pregnancy were not significantly different as regards demographic data, GSD, YSD and CRL. On the other hand, there was association between fetal bradycardia, increased serum CA125 or decreased serum progesterone and fetal loss. Estimation of CA125, progesterone serum level with the ultrasonographic findings in patients with threatened miscarriage are attempts to develop rapid, cheap and sensitive method for anticipating the pregnancy outcome and detecting which of them is the most accurate. According to our study, CA125 is the most accurate method.

Conclusion: CA125 is more accurate than progesterone and ultrasound findings in predicting fetal demise in cases of first trimester threatened miscarriage.

Key words

Biochemical; ultrasound; fetal loss; first trimester; threatened miscarriage

Introduction

The early first trimester of pregnancy is the fragile period for pregnancy viability, with up to 50% of embryos being lost before the pregnancy is clinically detected, and up to 15% to 25% of clinical pregnancies spontaneously miscarry ***(Bamniya et al., 2017)***.

Threatened miscarriage is a clinically descriptive term applied to women who are less than 20 weeks of gestation having vaginal spotting or bleeding, closed cervical os and possibly mild uterine cramps. It may progress to a term viable pregnancy or may result in incomplete, complete, missed or septic miscarriage. It occurs in about 20% of early pregnancies. it is a clinical dilemma for the obstetrician regarding the outcome of pregnancy ***(Kant et al., 2015)***

Ultrasound is an accurate method for evaluating threatened miscarriage because it can readily demonstrate the presence or absence of embryonic cardiac motion***. (Johns et al., 2006).***

The embryonic heartbeat can usually be identified by transvaginal sonography at 6 weeks' gestation. Previous studies have found association between severe embryonic bradycardia and fetal loss***. (Bamniya et al., 2017)***.

Fetal bradycardia is usually defined as: fetal heart rate (FHR) <100 bpm before 6.3 weeks gestation, or FHR <120 bpm between 6.3 and 7.0 weeks ***(Pillia et al., 2018)***.

In cases of threatened miscarriage Fetal bradycardia, discrepancy between gestational age and crown to rump length and a yolk sac larger than 7 mm are all adverse prognostic factors regarding fetal outcome ***(Rodgers et al., 2015).***

Serum Cancer Antigen 125 (CA125) is the most reliable marker for predicting the outcome of threatened miscarriage. According to ***Fiegler et al. (2003)*** a single CA125 concentration of at least 43.1 IU/ml was associated with a greater risk of miscarriage in 200 women who had had vaginal bleeding in their first trimester ***(Pillai et al., 2016).***

According to Witt et al 1990 Progesterone, due to its constancy in maternal serum during early normal gestation and due to its rapid metabolic clearance (<10 min), could potentially be an excellent marker for early pregnancy failure ***(Witt et al., 1990).***

Threatened miscarriage has a psychological impact on patients so we need to have a tool that could predict its outcome in advance.

Aim of the Work

To evaluate the accuracy of ultrasound findings in comparison to serum CA125 and progesterone in predicting fetal demise in cases of first trimester threatened miscarriage..

Chapter (1)
Miscarriage

The term 'miscarriage' is applied to many complications of early pregnancy, and it is important to be clear on terminology. In 2005, the European Society of Human Reproduction and Embryology (ESHRE) introduced a revised terminology regarding early pregnancy events **(Farquharson et al., 2005)**.

A pregnancy loss that occurs after a positive urinary human chorionic gonadotropin (hCG) or a raised serum β-hCG but before ultrasound or histological verification is defined as a 'biochemical loss'. In general, these occur before 6 weeks of gestation **(Jauniaux et al., 2006).**

The term clinical miscarriage is used when ultrasound examination or histological evidence has confirmed that an intrauterine pregnancy has existed. Clinical miscarriages may be subdivided into early clinical pregnancy losses (before gestational week 12) and late clinical pregnancy losses (gestational weeks 12 to 21). There is no consensus on the number of pregnancy losses needed to fulfill the criteria for recurrent miscarriage (RM), but ESHRE guidelines define recurrent miscarriage as three or more consecutive pregnancy losses before 22 weeks of gestation **(Jauniaux et al., 2006)**.