The Role of Creatine Kinase (CK) as a Biochemical Marker of placental invasion in women with Placenta previa

Thesis

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First thanks to **ALLAH** *to whom I relate any success in achieving any work in my life.*

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List of Abbreviations

Abb.	Full term
2DUS	**Two-dimensional ultrasound**
3D	Three-dimensional
3DPD	3 dimensional power doppler
3DUS	Three-dimensional ultrasound
ACOG	American College of Obstetricians and Gynecologist
AJOG	American Journal of Obstetrics and Gynecology
AUC	Area under the curve
CK	Creatine kinase
CS	Cesarean section
EGFR	Epidermal growth factor receptor
FFP	Fresh frozen plasma
IIA	Internal iliac artery
MAP	Morbidly adherent placenta
MNGCs	Number of multinucleated giant cells magnetic
MRI	Magnetic resonance imaging
MSUS	Multislice ultrasound
MSV	Multi-Slice View
NPV	Negative predictive value
OMD	Orthogonal display mode
PAD	Placental adhesion disorders
PPV	Positive predictive value
PRBCs	Packed red blood cells.
RCOG	Royal College of Obstetricians and Gynecologist
ROC	Receiver operating characteristic (ROC)
ROI	Region of interest
SD	Standard deviation
SPSS	Statistical package for social sciences
UA	Uterine artery
US	Ultrasound
VEGFR-2	Vascular endothelial growth factor receptor-2

Abstract

However combining two preoperative tools with eachother, showed significant improvement in detectionv rate of PAD.

This opens the field for the use of multipreoperative modalities in detection of PAD, rather than use of either sonographic or biochemical marker alone.

Yet, it is still not an ideal test, so furthur studies needed to assess additional biochemical &radiological modalities either alone or in combination with other modalities to be compared with results of our study aiming for better detection of all cases of MAP, aiming to decrease maternal morbidity & mortality, & to eliminate the fear associated with preoperative consent taken for hysterectomy in patients with no placental invasion &not in need for that step.

Key words: 3 dimensional power Doppler - Area under the curve - Epidermal growth factor receptor - Fresh frozen plasma- Internal iliac artery - Morbidly adherent placenta - Multislice ultrasound - Magnetic resonance imaging

INTRODUCTION

Placenta previa is a potentially life threatening obstetric condition that requires a multidisciplinary approach to management. The incidence of placenta accrete has increased and seems to parallel the increasing cesarean delivery rate. Women at greatest risk of placenta accreta are those who have myometrial damage caused by previous cesarean delivery with either anterior or posterior placenta previa overlying the uterine scar ***(ACOG, 2012).***

Placenta accreta occurs when the chorionic villi abnormally invade the myometrium. The reported incidence of placenta accreta is 1 per 2500 deliveries ***(Miller et al., 1997).***

Risk factors of placenta accreta include placenta previa, repeated cesarean deliveries, multiparity, history of abortion, and prior curettage. The growing trend of cesarean sections correlates with an increase in the incidence of placenta accreta ***(Serena et al., 2005).***

Unfortunately this life threatening obstetrical condition may be diagnosed at the time of delivery, often resulting in emergency treatment with a greater risk of morbidity. In contrast, a prenatal diagnosis would allow for a planned approach with the possibility of treatment under more controlled conditions, and could also reduce the blood loss associated with placenta accreta during delivery ***(Ramez et al., 2008)***.

Gray-scale ultrasound has been the cornerstone in diagnosing placenta accreta due to its wide availability and high accuracy with a sensitivity of 93% and a specificity of 79% ***(Chou et al., 2000)***. 3D power Doppler may be useful as a complementary technique for the antenatal diagnosis or exclusion of placenta accreta ***(Chih et al., 2008)***.

Aggressive management of hemorrhage through the use of uterotonics, fluid resuscitation, blood products, planned hysterectomy, and surgical homeostatic agents can be life saving for the patients. Conservative management, including the use of uterine and placental preservation and methotrexate therapy or pelvic artery embolization, may be considered when a focal accreta is suspected; however, surgical management remains the current standard of care ***(Tseng et al., 2006)***.

Clinically, the most significant feature of placenta accrete is the abundant uteroplacental neovascularization, which can lead to life threatening hemorrhage ***(Finberg and Williams, 1992; Levine et al., 1997).***However, its antenatal diagnosis is based on grey scale ultra sound imaging, such as the loss of subendometrial echolucent zone or presence of abnormal placental lacunae ***(Comstock et al., 2004).***

Despite the modern advances in imaging techniques, no single diagnostic technique afford complete assurance for the presence or absence of placenta accreta ***(ACOG, 2006).***

Creatine kinase (CK) expressed by vaarious tissue and cell types. CK catalyses the conversion of creatine and utilizes

adenosine triphosphate (ATP) to create phosphocreatine (PCr) and adenosine diphosphate (ADP). ***Wallimann et al. January 1999).*** Thus creatine kinase is an important enzyme in such tissues ***(Wallimann and Hemmer, 1994).***

Elevated maternal serum creatine kinase has been associated with placenta accreta and it has been suggested that there is a direct relationship between the extent of invasion and the elevation of this analyst ***(O'Brien et al., 1996).***

AIM OF THE WORK

This study aims to assess the accuracy of serum CK level as a predictor of placental invasion in women with placenta previa.

Research Hypothesis:

In women with placenta previa serum creatine kinase level may predict placental invasion.

Primary objective:

Is to detect whether creatine kinase is helpful in diagnosis of placental invasion in pregnant females with placenta previa.

Research Question:

In women with placenta previa, does serum cratine kinase level predict placental invasion accurately?