

University of Basra
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A study of oxidant-antioxidant status in recurrent spontaneous abortion

A thesis

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By

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Abstract

Background :

Human reproduction is not considered a highly efficient biological process. Before the end of the first trimester, 30%–50% of clinical and subclinical conceptions end in spontaneous abortion. Most losses occur at the time of implantation. 15%–20% of clinical pregnancies end in spontaneous abortions.

Recurrent pregnancy loss is a frustrating clinical problem both for clinicians and patients. Recurrent pregnancy loss affects 0.5%–3% of women in the reproductive age group, and between 50%–60% of recurrent pregnancy losses are idiopathic.

Oxidative stress-induced damage has been hypothesized to play a role in idiopathic recurrent pregnancy loss. Some studies implicate systemic and placental oxidative stress in the pathophysiology of recurrent pregnancy loss. Oxidant-induced endothelial damage, impaired placental vascularization and immune malfunction have all been proposed to play a role in the pathophysiology of idiopathic recurrent pregnancy loss.

Objective :

To evaluate the association of oxidative stress and impaired antioxidant defense system with the occurrence of recurrent spontaneous abortion .



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Method :

One hundred pregnant women (study group) with a history of recurrent spontaneous abortion (RSA) and one hundred pregnant women

(control group) without any history of spontaneous abortions , their age ranging (15-45yr.) . Both groups classified into many subgroups according to age , gestational age , parity and number of previous abortions .

Fasting blood samples were collected and tested for measurement of serum vitamin C , vitamin E , albumin , oxidative stress biomarker malondialdehyde (MDA) and some essential trace elements (zinc and copper) by using standard methods .

Results :

There is a significant ($p<0.05$) rise of serum oxidative stress biomarker (MDA) with a significant ($p<0.05$) decrease of serum antioxidant vitamins and essential trace elements in patients with history of RSA as compared to control females while there is no significant alteration ($p>0.05$) of serum albumin between the two studied groups .

The linear regression analysis demonstrated a significant ($r=0.61$, 0.85 , 0.3 , 0.73 , 0.47 , $p<0.05$) negative correlation for vit.C , vit. E , zinc , copper and Cu/Zn ratio respectively and significant ($r= 0.83$, $p<0.05$) positive correlation for MDA values with no. of previous abortions of study group . Also there is a significant ($r= 0.18$, 0.19 , 0.25 , 0.2 , $p<0.05$) negative correlation for vit.C , vit.E , copper and Cu/Zn ratio respectively



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and significant ($r= 0.2$, $p<0.05$) positive correlation for MDA values with the age of pregnant females of both control and study groups .

The results also observed a non significant correlation for serum vit.C , vit.E , albumin , MDA , zinc , copper and Cu/Zn ratio with gestational age in both groups of pregnant women while there is a significant positive correlation ($r=0.16, 0.18, 0.19$, $p<0.05$) of serum vit.C , vit.E and zinc respectively and a significant negative correlation ($r=0.17, p<0.05$) of serum MDA with parity in both control and study groups .

Conclusions :

Oxidative stress is present in most organs exposed to high oxygen metabolism such as the placenta. There is an emerging confluence of opinion that suggests that oxidative stress is one of the main underlying mechanisms in the pathogenesis of a continuum of disease processes such as spontaneous abortion, hydatidiform mole, and preeclampsia.

Recurrent pregnancy loss may be caused by oxidative damage to macromolecules and DNA and ROS-induced signal transduction for various genes are some of the underlying factors leading to recurrent abortion.

Oxidative stress and ROS-induced damage may be the missing pieces of the puzzle of abortion and recurrent pregnancy loss of unexplained etiology.

The various causative factors of early abortion and recurrent miscarriage ultimately may lead to depletion of antioxidant defenses. Variations in antioxidant levels have been documented and related to



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miscarriage, but there is a lack of consensus, and therapy with antioxidants is yet to be universally accepted. Some of the ongoing antioxidant trials should provide answers on their safety and effects on maternal and fetal outcomes. Further well-designed and effectively monitored randomized control trials need to be conducted to document the safety and efficacy of vitamins and antioxidant supplementation to prevent pregnancy loss.

