Status of Plasma Malondialdeyde and Certain Antioxidant Enzymes during Normal Pregnancy in North Indian Population (Punjab)

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ABSTRACT

Background: Free radicals and peroxides are involved in physiological phenomena such as synthesis of prostaglandin and thromboxanes and are thought to participate in pregnancy. Free radicals are also responsible for the pathogenesis of various diseases like atherosclerosis, inflammatory diseases and malignancies etc.
Objective: The objective of the present work was to investigate the alterations in oxidative stress markers by measuring malondialdehyde and certain antioxidant enzymes like xanthine oxidase, superoxide dismutase, glutathione, glutathione peroxidase and glutathione reductase in different trimesters.
Design of study: The level of malondialdehyde and antioxidant initiating enzyme xanthine oxidase and antioxidant scavenging enzymes like superoxide dismutase, glutathione, glutathione peroxidase and glutathione reductase was estimated in 200 healthy non pregnant and pregnant females ranging in age from 25 to 35 years.
Results: The level of malondialdehyde, xanthine oxidase and superoxide dismutase was significantly increased while the levels of glutathione, glutathione peroxidase and glutathione reductase were significantly decreased significantly in plasma of pregnant females with respect to non-pregnant females.
Conclusion: Our observations are suggesting that normal pregnant women's in the north Indian populations (Punjab) might be associated with an increase in oxidative stress.

Pregnancy is a stressful condition in which many physiological and metabolic functions are altered to considerable extent (Biolodean and Hubel, 2003) . The reproductive epoch in a women's life begins at menarche and ends at menopause. It usually extends from age 13 to 45 years. The average duration of pregnancy based on menstrual history has been traditionally calculated by clinicians to last for 10 lunar months or 9 calendar months and seven days. This corresponds to 280 days or 40 weeks from the first day of the last menstrual period. The duration of pregnancy is expressed in weeks of menstrual age or in gestational weeks (Daftary *et al.,* 1998). This gestation period has been divided into three trimesters. First trimester (0 to 12 weeks), second trimester (13 to 28 weeks) and third trimester (29 to 40 weeks) (Dutta, 1998). During normal pregnancy many gestational changes occur in the maternal body like enlargement of uterus with increase in blood supply, increase in cardiac output, increase in total blood volume, and increase in interstitial fluid volume. The metabolic demands placedon the maternal system to supply needs for fetal, uterine, placental and maternal growth are extensive. The metabolic rate and heat production increase about 25% as compared to non-pregnant state. Most of the increase in oxygen consumption is required to meet the demand of the metabolic activity of the products of conception (Selkurt, 1976). Because of the increased intake and utilization of oxygen, augmented levels of oxidative stress would be expected (Desai *et al.,* 2003)**.** Survey of literature (Casanuev and Viterri, 2003; Toescu *et al.,* 2004; Little and Gladen, 1999) revealed that pregnancy invokes an increase in lipoperoxidation and high SOD activity since early pregnancy. Theses lipid peroxides and formation of ROS may be involved in sever damage of cell molecule and structure (Carone *et al.,* 1993). So in the present work, we wanted to observe, whether normal pregnant women's are associated with oxidative stress or not by measuring the oxidative stress markers like malondialdehyde (representing lipid peroxidation), xanthine oxidase (XOD), superoxide dismutase (SOD), reduced glutathione (GSH), glutathione reductase (GR)