

Vitamin E concentration in normal pregnant women

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Summary: Twenty five healthy pregnant and 25 healthy nonpregnant volunteers were analysed with regard to serum lipid profile, malonaldehyde (MDA) and vitamin E. In pregnant women increase in MDA and fall in vitamin E was observed as compared to controls. With increasing age and parity rise in MDA and fall in vitamin E levels was more. Vitamin E determination may improve identification and risk stratification of patients at risk of developing preeclampsia.

Introduction

Low levels of lipid peroxidation are essential to many cellular processes in that small amounts of lipid peroxides and semistable breakdown products act as intracellular and extracellular messengers (Rolando, 1980). In normal pregnancy, Hubel et al (1989) have reported that there is an increase in lipid peroxides (malonaldehyde, MDA) levels. Vitamin E, the most potent lipid soluble antioxidant, may scavenge these free radicals and help in the protection of endothelial membrane in pregnancy (Miwa et al, 1996). There are conflicting evidences as to the status of vitamin E in pregnancy (Hubel et al, 1989; Scrinshaw et al, 1949). The present study is therefore aimed at evaluating MDA and vitamin E in healthy pregnant women and to correlate them with age and parity.

Methods

Twenty five nonpregnant healthy volunteers and 25

healthy normotensive pregnant women attending the Antenatal Clinic of Pt. B. D. Sharma PGIMS, Rohtak were selected. These subjects were screened to exclude diabetes mellitus, renal disease, primary hypertension. Dietary history was taken to rule out any dietary deficiency of vitamin E in these patients. Overnight fasting samples were taken by venipuncture and assayed for MDA (thiobarbituric acid reaction by Placer et al, 1960) and Vitamin E by spectrofluorometric method of Duggan (1950). Also, serum total cholesterol and triglycerides were estimated enzymatically. The results were statistically analysed.

Results

An increase in MDA levels in pregnant women was observed as compared to control nonpregnant women (Table I). With increasing age and parity, MDA levels were increased. In the other hand, vitamin E levels were low in pregnant women as compared to control (Table

Table I.
MDA and vitamin E levels

Age (Years)	No. of cases	Range	
		MDA (nmol/ml)	Vitamin E (µg/ml)
Non-pregnant			
18-20	10	0.77-1.01	10-12
21-25	10	0.77-1.29	9.3-15
26-30	5	0.83-1.29	8.6-11.5
Mean±S.D.		1.04±0.02	10.32±0.36
Pregnant			
20-25	10	9.54-1.65	7.1-13.4
26-30	10	0.77-1.64	5.7-9.4
31-35	5	0.86-1.68	7.6-12.5
Mean ± S.D.		1.68±0.12	9.4±0.38

Table II.

MDA and vitamin E levels in relation to parity

Parity	No. of cases	Range	
		MDA (nmol/ml)	Vitamin E (μ g/ml)
P0	13	0.99-1.65	5.7-13.4
P1	6	0.54-1.68	7.6-10.2
P2	3	0.92-1.23	9.4-10.9
P3 or more	3	1.07-1.53	8.9-12.5

II). Serum cholesterol levels were higher in pregnant women as compared to control (231 ± 21.2 vs 202 ± 4.7 mg%). Also, pregnant women had higher triglycerides than nonpregnant women (159 ± 3.53 vs 95 ± 9.5 mg%). Vitamin E: total lipid ratio was lower in pregnant women than in control (6.05 ± 3.93 vs 8.67 ± 6.26 mmol/g).

Discussion

In the present study, we observed higher lipid levels in normal pregnant women as compared to control. This increased lipid level may increase the susceptibility of polyunsaturated fatty acids to peroxidative damage presumably by the free radicals that may lead to the increased production of MDA. With increasing age, MDA levels were increased which are in harmony with those reported by Hubel et al, (1989). Ishihara (1978) and Tsukatani (1983) have reported increased MDA or other products of lipid peroxidation in normal pregnancy. There are conflicting evidences as to the status of vitamin E in pregnancy (Scrinsshaw et al, 1949). In the present study, serum vitamin E levels were lower in pregnant women as compared to control. Also, with increasing age the vitamin E levels were lower. This could be due to consumption of this antioxidant by increased lipid oxidation stress, such as free radical production induced by hypoxia (Hubel et al, 1989). With increasing parity, MDA levels were higher and vitamin E was lower which could be because of increasing age and increased stress

on the part of pregnancy. Besides acting directly as an antioxidant, vitamin E has beneficial actions on vascular reactivity, such as antiplatelet properties, and seems to modulate other signalling processes such as formation of prostanoids and steroids (Rolando, 1980; Miwa et al, 1996). Thus, vitamin E determination may improve identification and risk stratification of patients at risk of developing preeclampsia, since there is evidence that this disease is associated with endothelial cell compromise and elevated lipid peroxides. Studies are underway in this relation in our laboratory.

References

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