

## The Possible beneficial effects of Antioxidant drugs (Vitamin C and E) and Allopurinol in the management of Pre-eclamptic patients treated with Methyldopa.

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### Summary:

**Background:** Pre-eclampsia is culmination of a multi-step process that related in part to elevated oxidative stress and associated with hyperuricemia.

**Patients and methods:** Thirty normotensive and hundred pre-eclamptic pregnant women attending to Al-Basra hospital of pediatrics, obstetrics and gynecology were participated in this study. The patients were randomized into six groups. They were treated with methyldopa alone, methyldopa plus vitamin C, methyldopa plus vitamin E, methyldopa plus vitamin C and E, and methyldopa plus allopurinol. The oxidative stress (MDA), renal function parameters, systolic and diastolic blood pressure were evaluated before treatment and 14 day after initiation of therapy.

**Results:** Using allopurinol, vitamin C, vitamin E, and a combination of vitamin C and E together with methyldopa in pre-eclampsia can produce a significant reduction in the level of oxidative stress, on the other hand, some of these supplemental antioxidants can produce a significant reduction in systolic and diastolic blood pressures, serum creatinine and proteinurea as well as serum uric acid concentration in different extent.

**Conclusion:** Antioxidants and allopurinol when co-administrated with methyldopa, improves the maternal and biochemical indicators of pre-eclampsia and produce a better control of blood pressure.

**Keywords:** Pre-eclampsia, Antioxidants, Oxidative stress, Vitamin C, Vitamin E, Allopurinol.

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### Introduction:

Hypertensive disorders of pregnancy are considered as a major cause of maternal and perinatal mortality and morbidity worldwide, particularly in developing countries. Pre-eclampsia is a syndrome unique to pregnancy characterized by the new onset of hypertension, proteinurea and edema in the latter half of gestation. Several studies have shown that elevated oxidative stress might implicate in the pathophysiology of pre-eclampsia. In the early stages of pre-eclamptic pregnancy, failure of trophoblast invasion of the spiral arteries leads to reduced placental perfusion, and hypoxia. The hypoxia/reperfusion injury leads to increased expression of xanthine oxidase and NADP (H) oxidase and resultant increased generation of reactive oxygen species and peroxynitrite, which is followed by activation of the maternal endothelium, leading to the multisystem disorders seen in severe pre-eclampsia (1,2). Xanthine oxidase, an enzyme which produces uric acid spontaneously, is an important major source for oxygen free radical production

within the endothelium. (Vitamin E), Antioxidants, including the enzymes superoxide dismutase (SOD), glutathione peroxidase (GPx), and catalase, as well as, non-enzymatic compounds such as  $\alpha$ -tocopherol  $\beta$ -carotene, ascorbate (vitamin C), and glutathione can all counteracting free radicals damage (3). Vitamin C, a water-soluble antioxidant, is in a unique position to "scavenge" aqueous peroxy radicals before these destructive substances have a chance to damage the lipids. Vitamin E is a fat-soluble vitamin widely distributed in the membranes of cells, has generally been considered as an excellent antioxidant that protects cell membranes and other fat-soluble parts of the body from damage by free radicals. Vitamin C works along with vitamin E and the enzyme glutathione peroxidase to stop free radical chain reactions and since ascorbic acid is water soluble; it can work both inside and outside the cells to combat free radical damage (4). Allopurinol is a purine analog, it reduces the production of uric acid and inhibits the oxygen free radical production within the endothelium by competitively inhibiting the last two steps in uric acid biosynthesis that are catalyzed by xanthine oxidase (5).

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