Reduced Organ Pathogenesis In Hypervitaminosis A Induced Pregnant Wistar Rats Co-Supplemented With Ascorbic acid or Regenerative potentials found in ascorbic acid co-supplementation of vitamin A induced organ damage in pregnant rats

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Abstract

Organ transplantation has been successfully practiced in clinics for liver or kidney failure. Stem cells with the capability of self-renewal, pluripotency and differentiation is a futurist treatment option for diseases such as stroke, traumatic brain injury, Alzheimer, parkinson, spinal cord injury, baldness, blindness, deafness, wound healing, amyotrophic lateral-sclerosis, myocardial infarction, muscular dystrophy, osteoarthritis rheumatoid arthritis and diabetes. Current organ regeneration techniques include use of single adult tissue stem cell, a blastocyst complementation system coupled with a specific stem cell niche, decellularization and recellularization of bioscaffold and a combinatorial approach of tissue engineering and stem cells. At its most elementary level, regeneration is mediated by the molecular processes of DNA synthesis. Vitamin A is a lipid soluble vitamin essential for embryogenesis, growth and epithelial differentiation though teratogenic at high levels. While vitamin C, a hydrophilic free radical scavenger and a singlet oxygen quencher also functions to recycle other antioxidants. Here we demonstrated possible organ regeneration potential of ascorbic acid in a Vitamin A teratogenic induced organ injury without transplantation. Forty (40) adult female Wistar rats of average body weight 139 ±13 were randomly assigned to four groups, groups A-D (n=10) after pregnancy determination. The rats were fed daily with 50,000IU teratogenic dose of vitamin A for twelve days (12) days. However, groups B, C and D were co-administered with 1mg, 5mg + 1mg vitamin E and 30mg of vitamin C respectively while group A had only the vitamin A dosage (Control). Vitamins A and C were determined spectrophotometrically. Pan plug detection of pregnancy was use. Our result shows that group C (5mg supplementation) had a significantly (p<0.05) low vitamin A levels when compared with that of groups B and D. Supplementation with 1mg did not show any significant (p<0.05) reduction in vitamin A levels on comparison with that of group A. Histologic changes observed also showed a reduced liver and lungs pathogenesis at 5mg ascorbic acid + 1mg vitamin E administration (group C). The result of this preliminary study suggests that supplementation at 5mg vitamin C dosage may accelerate organ regeneration of teratogenic effect of vitamin A. It shows the possibility of complete kidney and liver repair using regeneration therapy.