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Nutrigenetics and Metabolic diseases: Towards Personalized Nutrition

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The concept of "Personalized" Medicine is now being extended to the field of Nutrigenetics, which investigates the impact of gene variation responses to intake of different nutrients. The ability of Nutrigenetics to determine what nutrients will produce the desired impact on metabolic balance (as influenced by individual genetic make-up) is at the core of Personalized Nutrition. Obesity is a heritable trait that arises from the interactions between multiple genes and lifestyle factors such as diet and physical inactivity. Dietary factors play an important role in the development of obesity because of the variation in the food that is being consumed in different parts of the world. Although several studies have examined the gene x nutrient interactions, the findings have been quite inconsistent and hence, unable to develop an optimum diet for each ancestral population. Some of the challenges in performing nutrigenetics research are 1) genetic heterogeneity, 2) lack of understanding of the metabolic pathways and 3) insufficient sample size. With genome-wide association study (GWAS) data now available on numerous large cohorts, it has become possible to embed candidate gene studies within GWASs, testing for association on a much larger number of candidate genes than previously possible. The talk will highlight three main aspects: 1). Why do we do gene-diet interaction analysis? – Findings from DiOGenes study, 2). Why large samples are required to conduct genetic epidemiological studies? – Findings from D-CarDia Collaboration and 3). Nutrigenetics in developing countries – Findings from GeNuIne Collaboration.

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Effects of reduced glutathione, water soluble vitamin E analogue and butylated hydroxytoluene on quality of cryopreserved boar spermatozoa

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The objective of the present study was to evaluate the comparative effects of reduced glutathione (GSH), water soluble Vitamin E analogue Trolox and butylated hydroxytoluene (BHT) on quality of cryopreserved boar spermatozoa. Sixteen sperm-rich fractions of ejaculates, collected from six mature boars were utilized for the study. Using split sample technique three different antioxidants *viz.*, GSH (1 mM), Vitamin E (0.2 mM) and BHT (0.2 mM) were added to the freezing medium of lactose-egg yolk-glycerol extender and frozen using controlled freezing rate of 40˚C/min from -6 to -140˚C in medium straw. Semen samples were evaluated for sperm motility, acrosomal status, plasma membrane integrity, mitochondrial membrane potential (MMP), lipid peroxidation (LPO) and sperm DNA integrity after equilibration and after freezing. Results revealed that GSH, Vitamin E and BHT addition resulted in significantly ($p<0.05$) higher post thaw motility, live intact acrosome and plasma membrane intact sperm as compared to no supplementation (control). The incidence of post thaw sperm lipid peroxidation was also significantly ($p<0.05$) reduced after supplementation of antioxidants. However, antioxidants treatment neither significantly ($p>0.05$) improved MMP of live sperm sub-population nor sperm DNA integrity after freezing. In addition, there was no significant difference of the post thaw sperm characteristics among the three antioxidants. Our findings suggest that the magnitude of protective measure conferred by GSH, Vitamin E and BHT on cryopreserved boar spermatozoa are comparable and thus incorporation of either GSH, Vitamin E or BHT in freezing medium could provide boar semen with better freezability.

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