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Grace George

Walter Sisulu University, South Africa

A comparative study of oxidative stress, antioxidant status, paraoxonase enzyme activity and possible modulation in type 2 diabetes and obesity

According to the International Diabetes Federation's (IDF) Atlas 2015, 415 million people in the world were diabetic in 2015, a figure that is likely to increase up to 642 million people by 2040. Most affected patients are unaware of the fact that they face the risks of developing secondary complications of diabetes. One of the major predisposing conditions to the development of diabetes is obesity which is increasing in epidemic proportions in both the developed and developing world. Both macro and micro vascular complications resulting as a consequence of diabetes are said to be increased by high levels of oxidized Low-Density Lipoproteins (LDLs) and low paraoxonase enzyme (PON1) levels. Oxidized LDL which is one of the major atherogenic lipids significantly elevated in diabetic patients in the region was reported. Present study reports a comparative study of paraoxonase enzyme activity in diabetes and obesity. Sixty participants were recruited for the study after informed consent. Thirty of them were known type 2 diabetic patients between the ages of 40 and 65 years on oral hypoglycemic treatment in a rural clinic in Mthatha. Type 2 diabetes patients on insulin/cholesterol lowering treatments and on multivitamins were excluded. Diabetes duration was less than five years. Thirty years age and gender matched individuals from the same community who were not at medication served as control. Results indicated statistically significant difference only in fasting blood glucose ($p < 0.001$) and glycated haemoglobin ($p < 0.001$). Other parameters like BMI, W/H ratio, lipid profile, oxidized LDL, total antioxidant capacity, paraoxonase concentration and activity did not differ significantly between the groups. In conclusion the trend observed in obese apparently healthy controls is cause for concern as they are equally at risk of developing macro-vascular complications. Details of this investigation and possible modulation of paraoxonase enzyme will be discussed.

Biography

Grace George is a Biochemist who obtained her PhD from Central Food Technological Research Institute, Mysore, one of the premier research institutions of CSIR (India). She is a Professor of Medical Biochemistry in the Faculty of Health Sciences at Walter Sisulu University, Mthatha, South Africa. She has published over 40 papers in reputed journals and actively involved in Postgraduate training. Her current research interests include oxidative stress and antioxidants in health and disease; modulation of oxidative stress in type 2 diabetes; bioactives of lesser known indigenous food plants and human geophagia.

ggeorge.grace@gmail.com

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