

6th Asia-Pacific Pharma Congress

July 11-13, 2016 Kuala Lumpur, Malaysia

Treatment with Pioglitazone, a thiazolidinedione insulin sensitizer and/or β -carotene and diet control ameliorate liver function and metabolic markers in hyperlipidemic rats

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Insulin resistance and oxidative stress are key pathophysiological mechanisms in non-alcoholic fatty liver disease (NAFLD). This study was conceived to explore the effect of treatment with the insulin sensitizer, pioglitazone (PGZ) and/or the antioxidant, β -carotene (β C) on regression of NAFLD, in a rat experimental model induced by a high-fat diet (HFD) for twelve weeks. For an additional four weeks, rats were either maintained on HFD or switched to standard regular diet (RD) along with PGZ, β C alone or in combination. Serum lipid levels, liver function and antioxidant enzymes, adipocytokine markers were measured and liver injury was evaluated by histopathological examination. Liver sections of NAFLD-HFD rats revealed steatosis, inflammation and fibrosis. In addition, liver index, activities of serum liver enzymes ALT, AST, ALP, gamma-glutamyl transferase (GGT) and levels of total cholesterol (TC), triglycerides (TG), LDL and VLDL were elevated ($P < 0.05$) versus normal. This was coupled with an increase in hepatic malondialdehyde (MDA) and serum leptin, tumor necrosis factor- α (TNF- α) and transforming growth factor- β 1 (TGF- β 1) and depletion ($P < 0.05$) of superoxide dismutase (SOD) activity, GSH content in liver, serum HDL and adiponectin compared with normal. These changes were to a less extent in NAFLD-RD group. Treatment with PGZ and/or β C almost improves all previously mentioned parameters. Moreover, PGZ+ β C treatment decreased hepatic steatosis and markedly ameliorated inflammation than groups treated with each drug alone. In conclusion, data in this study indicate that β C can be used as promising adjuvant therapy to PGZ in treatment of NAFLD.

Biography

Sayed H Seif el-Din has completed his PhD from Ain Shams University. He is currently a Professor of Pharmacology in TBRI. He shared in establishment of "Drug Evaluation and Discovery Unit" and is one of the Senior Staff of the "ANDI Centre of Excellence on anti-trematodal R&D". He has published nearly 25 articles in reputed journals and is serving as a Reviewer for many peer reviewed journals. He was awarded the TBRI best research article in 2012. He was included in Marquis Who's Who in Science and Engineering, 2011 and 2015 editions. He was also selected by the American Biographical Institute (ABI) to be inducted into the Professional Hall of Fame 2011 and by the International Biographical Centre (IBC) to be included in the "2000 Outstanding Intellectuals of the 21st century" 2012 edition.

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