Effect of aqueous extract of Gmelina arborea on glucose homeostasis in alloxan induced diabetic rats

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OP 68: GSTM2 C terminal domain alters the contractility and Ca^{2+} transients in cultured ventricular cardiomyocytes

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Introduction: The ryanodine receptor (RyR) functions as an ion channel that releases Ca2+ from the sarcoplasmic reticulum and is essential for excitation-contraction coupling and contraction in striated muscle. In previous studies we have shown that the human muscle specific glutathione transferase M2-2 C terminal domain (GSTM2C) is a high affinity inhibitor of cardiac muscle ryanodine receptors (RyR2).
Aims: The objective of this study was to determine the effect of GSTM2C on the cardiac function.
Methods: The study was performed on primary cardiomyocyte cultures from neonatal rats. Cardiomyocytes were stimulated at 1Hz, 3V for 2ms duration and cell beating was recorded in both control and 15?M GSTM2C treated cells. Contractility and Ca2+ transients were compared in cardiomyocytes treated with and without GSTM2C terminal domain using confocal microscopy.
Results: Percentage shortening of field stimulated cells was not significantly different in the control group between the first (6.1±0.7%) and second (6.2±0.9%, 2 hrs later) stimulations. However, it was reduced from 7.3±0.8% to 4.1±0.6% in the GSTM2C treated cardiomyocytes ($P<0.01$). Ca transient profiles of GSTM2C treated cardiomyocytes were significantly different from that of normal controls where the peak intensity and the frequency were reduced significantly.
Conclusions: Single channel lipid bilayer experiments and Ca2+ release assays confirmed the ability of GSTM2C to inhibit RyR2. Inhibition of RyR2 is a potential strategy for the treatment of heart failure. Our results confirms that GSTM2 C terminus also alters the cardiac function by inhibiting the RyR2 and thus reducing Ca2+ release through RyR2 in ventricular cardiomyocytes.

OP 69: Effect of aqueous extract of *Gmelina arborea* on glucose homeostasis in alloxan induced diabetic rats

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Introduction: Diabetes mellitus has been recognized as a crippling global health problem in the past few decades. Despite the great strides made in prevention and management of diabetes, disease-related complications are increasing unabated .The search for novel drugs from medicinal plants has increased due to their efficiency and recurrent drawbacks in existing antidiabetic agents. The efficacy and dose response of aqueous bark extract of *Gmelina arborea*(GAAq,Sinh Et-demata) in diabetic rats was determined previously.
Aims: To investigate the effect of repeated administration of GAAq on glycaemic control in alloxan induced diabetic rats.
Methods: Wistar rats were divided in to four groups (n=6). Group 1 and 2 served as untreated normoglycaemic and diabetic rats (150 mg kg -1i.p.). Group 3 and 4 diabetic rats were administered the GAAq (1gkg-1) and glibenclamide (0.5mg kg -1)orally for 30 days respectively. At weekly intervals, oral glucose tolerance test was performed and body weights of animals were recorded. Glycosylated haemoglobin percentage (%HbA1C) was estimated on the 30th day.
Results: The GAAq and Glibenclamide reduced the FBG by 40% and 57%, improved glucose tolerance by 46 and 53% ($p=0.01$) respectively in diabetic rats. The GAAq and glibenclamide reduced HbA1c to 6.74±0.02% and 6.31±0.04% respectively ($p=0.001$). The fasting blood glucose concentration and %HbA1Cwere increased whereas body weights were reduced in diabetic control rats as compared to normoglycaemic rats. In contrast the body weights improved periodically in GAAq treated diabetic rats.
Conclusions: This study revealed that the aqueous extract of *Gmelina arborea* improved the glycaemic control in alloxan-diabetic rats.