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Madhuram, a poly herbal formaulation in 3t3l1 cell lines augments glucose uptake and ameliorates insulin resistance by regulating glucose transporter-4, peroxisome proliferator-activated receptor - gamma gene expression *in vitro*

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Back ground: Major barrier for integrating CAM into modern clinical practice is the lack of the proof for quality control, safety and efficacy through an evidence based approach. Identification of underlying mechanism of action of polyherbal formulations, have generally not been elucidated due to the lack of knowledge in identifying their contained active phytochemical constituents. In our present work we made an attempt to identify the possible mechanism of action of an antidiabetic poly herbal 'Madhuram' which is standardized for its specific phytochemical markers.

Methods: Methanol extract of the formualtion (MEF) was tested for cytotoxicity in 3T3L1 preadipocytes. 3T3-L1 preadipocytes, were induced for adipocyte differentiation by adding differentiation media containing 0.5 mM/l of IBMX, 0.25 lM/l of DEX and 1 mg/l of insulin in DMEM medium with 10% FBS. Glucose uptake potential of MEF was estimated in differentiated adipocytes from 1-1000 µg/ml concentartion using Pioglitazone as a standard drug. For evaluating the adipogenic activity, MEF was added along with differentiation media to preadipocyets at 32.5-500 µg/ml concentration and activity was measured by oil red O staining using pioglitazone as negative control. For confirming the actual mechanism of MEF, regulation of PPAR gamma and Glut4 mRNA were studied using RT-PCR analysis.

Results: Cytoxicity of MEF is neglegable even at 1000µg/ml. At the tested doses, MEF increased glucose uptake in dose dependantly and at 125 µg/ml it completely inhibited lipid droplet formation. PPAR gamma and glut4 expression is upregulated in a dose dependant manner at 100, 200, 300 µg/ml concentration.

Conclusion: Madhuram is showing antidiabetic activity by ameliorating insulin resistance through inhibiting the adipogenesis.