8. Summary

Chronic unpredictable mild stress (21 days) was associated with hypercorticosteronemia and insulin resistance but not hyperglycemia or hypoinsulinemia. Chronic unpredictable mild stress induced depressive like behaviour, spatial and associative memory deficit, and hypolocomotion. Stinging nettle reversed stress mediated hypercorticosteronemia, insulin resistance, depressive like behaviour, spatial and associative memory deficit. Stinging nettle did not modulate hypolocomotion in stressed mice. Effects of HYP and FLX were similar to that of UD treatment but they did not modulate insulin resistance. Chronic stress exacerbated muscarinic cholinergic system, insulin signaling pathway, autophagy and Smo-Gli pathway in the hippocampus. Chronic stress induced oxidative stress and inflammation which were reversed by chronic stinging nettle treatment comparable to FLX, ROSI and HYP. Stinging nettle extract modulated stress induced alteration in muscarinic cholinergic system, insulin signaling pathway, autophagy and Smo-Gli pathway in the hippocampus. Stinging nettle did not modulate stress induced alteration in glucose transporter type-4 membrane translocation in hippocampus whereas ROSI significantly modulated the GLUT4 translocation. FLX and HYP treatment did not modulate insulin resistance and insulin signaling pathway. FLX and ROSI did not modulate Smo-Gli pathway. ROSI and HYP treatment did not modulate muscarinic cholinergic system. Streptozotocin induced chronic diabetes showed hyperglycemia, hypoinsulinemia, insulin resistance, polydypsia and body weight loss which were reversed by chronic stinging nettle treatment. Streptozotocin induced comorbidity of diabetes and depression. Further comorbidity was associated with cognitive dysfunction, locomotion deficit. Stinging nettle reversed diabetes induced depression and cognitive dysfunction. Stinging nettle did not modulate hypolocomotion in diabetic mice. Chronic diabetes induced oxidative stress and inflammation which were reversed by chronic stinging nettle treatment. Stinging nettle extract modulated diabetes mediated alteration in muscarinic cholinergic system, insulin signaling pathway and autophagy in the hippocampus. Stinging nettle extract did not modulate muscarinic receptors expression in striatum. The effect of UD was similar to that of ROSI treatment however ROSI did not modulate acetylcholinesterase expression in hippocampus.