and creatinine) and oxidative stress (LPO, GSH, GPx, Catalase, and SOD) were analyzed at the end of fifteen days. The results indicate significant reduction in body weight of non programmed and programmed diabetic animals along with compromised feed efficiency, hyperglycaemia, hypoinsulinemia, decreased glycogen content and elevated serum and tissue lipids, increased lipid peroxidation, decreased levels of non-enzymatic and enzymatic antioxidants as well as serum markers of hepatic and renal stress. The corticosterone programmed diabetic animals showcased greater severity for the above listed metabolic changes than the non-programmed diabetic rats. However, treatment with melatonin simultaneously prevented to a significant extent the alterations in carbohydrate and lipid metabolism and oxidative stress. It is concluded that, melatonin is a potent deprogrammer of neonatal corticosterone programming effects and the adult thrifty phenotype alteration to a diabetogenic challenge.

Chapter 8

The present study tries to understand the effect of neonatal corticosterone programming to a diabetogenic challenge in the adult and the potential of melatonin as an ameliorative agent against the induced changes. Healthy male and female rats were maintained under standard conditions of temperature and light and, when mated females delivered pups, neonates of both sexes were separated and equal number of pups assigned to lactating mothers. Pups were treated with either saline or corticosterone from PND 2 to PND 14 and maintained thereafter till 120 days of age. At this age, rats were challenged with a diabetogen (alloxan at a dosage of 120mg/kg) and rats with serum glucose above 300mg/dl were considered diabetic and used for further

experimentation. Diabetic rats were treated with either saline or melatonin (1mg/kg body weight) for a period of 15 days thereafter. Various serum and tissue parameters pertaining to glycaemic regulation (serum glucose, insulin, GTT, IRT, tissue glycogen and enzymes of carbohydrate metabolism), dyslipidemia (serum and tissue lipids), renal and hepatic distress markers (serum SGPT, SGOT, ALP, ACP, urea and creatinine) and oxidative stress (LPO, GSH, GPx, Catalase, and SOD) were analyzed at the end of fifteen days. Alterations due to neonatal corticosterone programming were evident in the form of reduction in body weight of non programmed and programmed diabetic animals along with compromised feed efficiency, hyperglycaemia, hypoinsulinemia, decreased glycogen content and elevated serum and tissue lipids, increased lipid peroxidation, decreased levels of non-enzymatic and enzymatic antioxidants as well as serum markers of hepatic and renal stress. The intensity of these changes was much more pronounced in Cort programmed diabetic rats as compared to non programmed rats. Melatonin administration for a short duration of 15 days could effectively ameliorate the changes in hyperglycaemia and carbohydrate metabolism but was not fully effective in restoring the alterations in serum and tissue lipids and the elevation in the serum markers of hepatic and renal function. More so, the changes in oxidative stress were also not completely reduced to normal level. Overall, it can be concluded that melatonin is useful in ameliorating the aggravated changes in corticosterone programmed diabetic rats and that, a treatment schedule involving higher dose for longer duration is likely to be of greater therapeutic value as, the dosage in the present study is very low.