

3.3. Evaluation of pharmacological activity of insulin-loaded nanoparticle preparation

The percentage base level blood glucose change of diabetic rats after administration of 50 IU/Kg of insulin-loaded nanoparticles orally showed a decrease in blood glucose of experimental animals to a significant level starting from 2 h reaching a peak change of 68% at 10-hour interval and afterwards blood glucose levels increased. The subcutaneous insulin (1 IU/Kg) on diabetic rats showed an expected effect on blood glucose concentration appeared from the first hour and its action ended after 6 hours. At 1,2,3 h SC insulin significantly dropped down ($p < 0.001$). The percentage base level blood glucose change of diabetic rats after administration of placebo nanoparticles showed increment within the first 2 hours of the experiment due to the stress that the rats exposed to it during the placebo administration, and this increment came back to the original level after that. (Figure 3.3)

Results indicated there was no evident hypoglycemic effect after the oral administration of the insulin-loaded nanoparticles formula to normal rats. In normal rats, significant reduction on blood glucose level was obtained at the first hour ($p < 0.05$), while at 2 hours postdose of subcutaneous injection of 1 IU/ml insulin, the glucose level began to increase, recovering to about 95% of the initial level at 3 hours (Figure 3.4).

The glucose level versus time profiles following the administration of oral insulin formulation to STZ diabetic and normal rats was showed in (Figure 3.5). At time 8, 10, 18 hrs, significant reduced glucose level was obtained in STZ diabetic rat ($p < 0.05$).