

Effects of Concomitant Use of Metformin and Powdered Moringa Oleifera Leaves on Glucose Tolerance in Sprague-Dawley Rats

Authors : Emielex M. Aguilar, Kristen Angela G. Cruz, Czarina Joie L. Rivera, Francis Dave C. Tan, Gavino Ivan N. Tanodra, Dianne Katrina G. Usana, Mary Grace T. Valentin, Nico Albert S. Vasquez, Edwin Monico C. Wee

Abstract : The risk of diabetes mellitus is increasing in the Philippines, with Metformin and Insulin as drugs commonly used for its management. The use of herbal medicines has grown increasingly, especially among the elderly population. Moringa oleifera or malunggay is one of the most common plants in the country, and several studies have shown the plant to exhibit a hypoglycemic property with its flavonoid content. This study aims to investigate the possible effects of concomitant use of Metformin and powdered M. oleifera leaves (PMOL) on blood glucose levels. Twenty male Sprague-Dawley rats were equally distributed into four groups. Fasting blood glucose levels of the rats were measured prior to experimentation. The following treatments were administered to the four groups, respectively: glucose only 2 g/kg; glucose 2 g/kg + Metformin 100 mg/kg; glucose 2 g/kg + PMOL 200 mg/kg; and glucose 2 g/kg + PMOL 200 mg/kg and Metformin 100 mg/kg. Blood glucose levels were determined on the 1st, 2nd, 3rd, and 4th hour post-treatment and compared between groups. Statistical analysis showed that the type of intervention did not show significance in the reduction of blood glucose levels when compared with the other groups ($p=0.378$), while the effect of time exhibited significance ($p=0.000$). The interaction between the type of intervention and time of blood glucose measurement was shown to be significant ($p=0.024$). Within each group, the control and PMOL-treated groups showed significant reduction in blood glucose levels over time with p -values of 0.000 and 0.000, respectively, while the Metformin-treated and the combination groups had p -values of 0.062 and 0.093, respectively, which are not significant. The descriptive data also showed that the mean total reduction of blood glucose levels of the Metformin and PMOL combination treatment group was lower than the PMOL-treated group alone, while the mean total reduction of blood glucose levels of the combination group was higher than the Metformin-treated group alone. Based on the results obtained, the combination of Metformin and PMOL did not significantly lower the blood glucose levels of the rats as compared to the other groups. However, the concomitant use of Metformin and PMOL may affect each other's blood glucose lowering activity. Additionally, prolonged time of exposure and delay in the first blood glucose measurement after treatment could exhibit a significant effect in the blood glucose levels. Further studies are recommended regarding the effects of the concomitant use of the two agents on blood glucose levels.

Keywords : blood glucose levels, concomitant use, metformin, Moringa oleifera

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