

Preparation of Zinc Oxide Nanoparticles and Its Anti-diabetic Effect with Momordica Charantia Plant Extract in Diabetic Mice

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Abstract : This study describes the preparation of zinc oxide nanoparticles and their anti-diabetic effect individually and with the combination of Momordica charantia plant extract. This plant is termed bitter melon, balsam pear, bitter gourd, or karela. Blood glucose levels in mice were monitored in their random state before and after the administration of zinc oxide nanoparticles and plant extract. The powdered form of nanoparticles and the selected plant were used as an oral treatment. Diabetes was induced in mice by using a chemical named as streptozotocin. It is an artificial diabetes-inducing chemical. In the case of zinc oxide nanoparticles (3mg/kg) and Momordica charantia plant extract (500mg/kg); the maximum anti-diabetic effect observed was $70\% \pm 1.6$ and $75\% \pm 1.3$, respectively. In the case of the combination of zinc oxide nanoparticles (3mg/kg) and Momordica charantia plant extract (500mg/kg), the maximum anti-diabetic effect observed was $86\% \pm 2.0$. The results obtained were more effective as compared to standard drugs Amaryl (3mg/kg), having an effectiveness of $52\% \pm 2.4$, and Glucophage (500mg/kg), having an effectiveness of $29\% \pm 2.1$. Results indicate that zinc oxide nanoparticles and plant extract in combination are more helpful in treating diabetes as compared to their individual treatments. It is considered a natural treatment without any side effects rather than using standard drugs, which shows adverse side effects on health, and most probably detoxifies in liver and kidneys. More experimental work and extensive research procedures are still required in order to make them applicable to pharmaceutical industries.

Keywords : albino mice, amaryl, anti-diabetic effect, blood glucose level, Camellia sinensis, diabetes mellitus, Momordica charantia plant extract, streptozotocin, zinc oxide nanoparticles

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