

Research Day Abstract

Evaluation of Herbal-Based Blood Glucose Lowering Agents and Synthetic-Herbal Drug Interaction Relationships in the Treatment of Type 2 Diabetes Mellitus

Authors: Nwabisa Lolwana and Kedibone Gloria Mawela

Affiliations: Department of Pharmacology and Therapeutics, School of Medicine, Sefako Makgatho Health Sciences University

Type 2 Diabetes Mellitus (T2DM) accounts for over 90% of diagnosed diabetes cases in South Africa, and approximately 80% of patients on antidiabetic medication concurrently use herbal medicines. These complementary therapies are linked to high morbidity and mortality due to poorly understood herb-drug interactions. This study evaluated the blood glucose-lowering agents of two commercial herbal medicines used in T2DM treatment: *Hypoxis hemerocallidea* (Herb-1) and a combination of *Drimys sanguinea* and *Hypoxis hemerocallidea* (Herb-2), and their interaction with acarbose. Pulverised herbal medicines were extracted using aqueous, hexane, acetone and ethanol solvents and evaluated for α -amylase and α -glucosidase inhibition. While the drug interaction relationship between an aqueous medicine and a blood glucose lowering drug (acarbose) was determined after co-incubation for 6 h followed by sample harvesting every 2 h. Both herbal medicines demonstrated significant enzyme inhibition. Aqueous extracts showed the highest α -amylase inhibition (99%), followed by acetone (Herb-1 [88%]; Herb-2 [94%]) and ethanol (Herb-1 [76%]; Herb-2 [92%]), all exceeding acarbose (68%). However, co-incubation of aqueous extracts with acarbose, resulted in a progressive decline in enzyme inhibition after 2 h. For α -glucosidase, Herb-1 decreased from 67% to 50% and Herb-2 from 9% to 7%. For α -amylase, Herb-1 decreased from 99% to 92% and Herb-2 from 99% to 84%. These findings indicate the polar nature of α -amylase and α -glucosidase inhibitors which were found in polar solvents and a drug interaction that reduces overall therapeutic efficacy. Hence, the concurrent use of these herbal medicines may be unsuitable as complementary therapies alongside acarbose in T2DM management.