The *in vitro* inhibition and stimulation of isolated diabetic human neutrophils by commercial herbal medicines used as African traditional medicines

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Introduction: The use of commercial herbal mixtures (HMs) in South Africa (SA) is increasing, particularly those regarded as immune boosters and tonics. These HMs have not been tested for efficacy and safety, hence their users may be predisposed to unknown adverse effects. Their presence may impact on the therapeutic outcomes of patients on treatment of chronic conditions such as diabetes mellitus. This study was aimed to investigate the effects of the HMs on the activity of isolated diabetic human neutrophils.

Methods: Five HMs commonly used in Pretoria, SA as immune boosters were selected. They were *Intlamba Zifo*TM (HM1), *Maphilisa*TM Herbal medicine (HM2), *Matla*TM African medicine for all diseases (HM3), *Ngoma*TM Herbal Tonic Immune Booster (HM4) and *Vuka Uphile*TM Immune Booster (HM6). Standard serial dilutions of each HM, from 10 to 10000 times were prepared. Neutrophils were isolated from blood samples collected from consenting diabetes mellitus patients who were on regular treatment. The neutrophils were incubated with each HM at different strengths for 30 minutes at 37° C. Their luminol-enhanced luminescence (LEL) activity was measured in the Orion L luminometer at various time intervals over 60 minutes after activation with the phorbol myristate acetate (PMA). The results were then calculated and expressed as percentage inhibitions of each when compared to the control.

Results: The highest concentration of each of the HMs had potent inhibitory effect on the LEL activity of the cells. The lower concentration standards, that is the 10, 100 and 1000 times dilutions of HM1 to HM4 had weak to moderate inhibitory effects, proportional to the concentration. The highest diluted solutions of these HMs had weak stimulatory effects. HM6 and its dilutions had weak to potent inhibitory effects on the neutrophils.

Conclusion: The HMs caused *in vitro* inhibition of neutrophils at high doses, and stimulation at low doses. These variable effects emphasise the significance of appropriate dosing. Both inhibition and stimulation of neutrophils in diabetes mellitus may affect the immune system resulting in aggravation of the condition or interfering with the treatment. It is therefore worthwhile to enquire and counsel patients accordingly about the use of these commercial herbal medicines.