Effects of Different Fractions of Korean Red Ginseng on anti-diabetic effect in Type 2 Diabetic NSY Mice

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Objective and Aim

Therapeutic properties of Korean red ginseng (KRG) on diabetes have been extensively introduced in the literature. Saponin, or ginsenoside, is considered as the major bioactive component mediating the therapeutic effects of KRG, the exact physiological mechanism underlying anti-diabetic effects is, however, still not fully elucidated. More than 30 different saponins together account for only about 3-4% of KRG, thereby, it is assumed that non-saponin fraction of KRG also carry potential anti-diabetic effects; however, there is no study reporting the differentiated effects of saponin and non-saponin fractions of KRG on glycemic indications and hyperglycemia-associated complication markers.

To clarify the differentiated effects of saponin and non-saponin fractions of KRG on glycemic indications and hyperglycemia-associated complication markers.

Methods

12-week-old male Nagoya-Shibata-Yasuda (NSY) mice were allocated into 4 groups: control group given standard rodent diet (SRD) or treatment groups given either Korean red ginseng extract (KRG), saponin fraction from KRG extract (Spn) or non-saponin fraction from KRG extract (NSpn) admixed in SRD. The targeted administration doses of KRG, Spn and NSpn were all 200 mg/kg/day; all mice were fed assigned regimens for 24 weeks. Parameters for glycemic control, blood lipid profile, inflammation, oxidative stress, and anti-oxidant enzymatic activities were measured.

Results

Figure 1. Changes in fasting blood glucose

Abbreviation: FBG- fasting blood glucose

Results

Figure 2. Changes in parameters of glycemic control

Abbreviation: AUC- Area under curve, oxLDL- oxidized Low density lipoprotein cholesterol, AGEs- Advanced glycation end products

Figure 3. Accumulation of MDA(kind of AGEs) in skeletal muscle

Abbreviation: MDA- Malondialdehyde

Conclusion

This study showed that anti-diabetic properties of KRG are not mainly mediated by saponin, but the therapeutic potentials of KRG may be due to the orchestral effects of both saponin and non-saponin.