

## The effects of Korean red ginseng on microvascular complications in type 2 diabetes patients

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**Background:** Many type 2 diabetes patients in Korea take Korean red ginseng(KRG) for a well-being sense as well as its possible beneficial effects on glucose tolerance and insulin resistance. However, the clinical evidence of KRG on diabetic complications are lacking. In this study, we investigated the effects of KRG administration on chronic microvascular complications in type 2 diabetes patients. **Methods:** This study was a randomized, double-blind, placebo-controlled trial conducted with type 2 diabetes patients who visited Gangnam Severance Hospital from April 2016 to July 2017. They were randomly allocated to placebo or KRG group and took 2 corresponding tablets twice a day (total 2 grams of KRG extract powder a day) for 24 weeks. The primary outcomes were changes of diabetic microvascular complication markers at week 24: Estimated glomerular filtration rate (eGFR), urinary albumin to creatinine ratio (uACR), Kidney injury molecule-1 (KIM1), laminin-P1 as a marker for diabetic retinopathy, and current perception threshold (CPT). Secondary outcomes were changes in fasting plasma glucose and HbA1c at week 24. Various mediators of diabetic complications were measured. **Results:** Sixty one patients completed the study. The eGFR was increased and uACR and KIM1 improved in KRG group. Placebo group showed a decreased in eGFR and increased in uACR. Laminin-P1 showed a tendency to improve at week 24 in both groups. Current perception threshold (CPT) of the lower extremities at 2000Hz, 250Hz, and 5Hz showed a significant improvement (all  $p < 0.05$ ) at week 24 in KRG group while there was no difference in placebo group. There were significant correlations between changes advanced glycation end product(AGE) and KIM1 and between changes in laminin-P1 and oxidized LDL ( $p = 0.009$  and  $0.028$ , respectively). Fasting plasma glucose and HbA1c were not changed after 24 weeks in both groups. **Conclusion:** Twenty-four week administration of KRG in type 2 diabetes patients showed a tendency toward improvements in diabetic nephropathy and retinopathy, and a significant improvement in neuropathy. A further, larger population study with a longer follow-up period is warranted to verify the effects of KRG on diabetic complications.

## A rare case of hypercalcemia caused by primary bone marrow B-cell lymphoma

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Hypercalcemia is a common clinical finding with various etiologies. Failure to provide timely intervention can lead to adverse clinical outcomes, including several fatal conditions such as decreased consciousness and life-threatening cardiac arrhythmia. This case report describes a case of a 74-year-old male patient who presented with severe hypercalcemia and distal femur fracture. Despite massive intravenous hydration and bisphosphonate use, the patient's hypercalcemia recurred, and acute kidney injury also developed. After full laboratory workup and two bone marrow biopsies, the cause of hypercalcemia was determined as primary bone marrow B-cell lymphoma, which is an extremely rare disease with few cases having been described worldwide so far. This case illustrates the importance of aggressive workup of refractory hypercalcemia, particular when accompanied by other poor clinical signs such as renal failure and bone fracture.

Table 1: Serial measurement of serum calcium, ionized calcium, BUN, and creatinine (POD: postoperative day of femur fracture)

	Baseline	POD 1	POD 10	POD 21	POD 25	POD 32	POD 40
Calcium (mg/dL)	13.9	12.6	12.0	15.2	9.3	11.8	16.2
Phosphate (mg/dL)	4.34	3.54	3.44	4.49	1.69	3.16	5.03
Blood urea nitrogen (mg/dL)	27	27.6	32.0	54.2	37.0	17.4	42.7
Creatinine (mg/dL)	1.54	2.00	1.81	3.18	2.41	1.01	2.74
Remark		2 <sup>nd</sup> operation		Hydration and bisphosphonate initiated		Discharged on POD 37	Readmission due to nausea, vomiting

