

Clinical Effectiveness of Korea Ginseng on Climacteric Disturbances and Its Possible Mechanism of Action

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Abstract □ The climacterium is that phase in the aging process during which a woman passes from the reproductive to the non-reproductive stage. The signals, such as hot flashes, vaso-motoric disturbances, perspiration, stiff shoulders, emotional symptoms, are referred to as climacteric disturbances. Treatment of climacteric symptoms centers around estrogen replacement and tranquilizers, but there are many problems to be solved to use these hormones/drugs as far as dosage, duration and complications are concerned. The care of women during the climacteric years should provide relief of distressing symptoms with as high a degree of safety as possible. From this view point, we used red ginseng powder to those patients with high menopausal index successfully. We studied its mechanism of action and proved that red ginseng improved the micro-circulation system via improvement of erythrocyte deformability which enhanced sex steroidogenesis consequently.

Introduction

The climacterium is that phase in the aging process during which a woman passes from the reproductive to the nonreproductive stage. The signals that this period of life has been reached are referred to as climacteric disturbance.

The climacteric disturbance is one of the most popular disease in the gynecological field. In fact, about 70% or more of the climacteric women suffer from the disease and 10 to 20% of them need to treat.

For the disease, there are such useful therapies as hormone therapy or drug therapies. Hormone therapy of estrogen replacement is more effective for the disease than any other therapies either with tranquilizers or sedatives. But, there are many problems to be solved in the management with hormones. A more reasonable and yet clinically adequate therapy is required. From this view point, we studied effects of red ginseng powder on climacteric disturbance.

Materials and Methods

We studied of 83 women with climacteric disturbance on their climacteric or menopausal symptoms before and 8 weeks after administration of 6g red ginseng powder per day. The clinical effectiveness was expressed as % decrease of the menopausal index based on the questionnaire before and at 8 weeks after administration (Table 1). Gonadotropin of follicle stimulating hormone (FSH), prolactin (PRL) and ovarian sex steroids of estrone (E_1) and estradiol (E_2) were measured before and 4 or 8 weeks after administration of red ginseng powder.

Erythrocyte deformability was measured by a minor modification of the original method of Reid *et al.*¹ Blood specimen obtained by venous puncture with a heparinized syringe was resuspended to the phosphate buffered saline of pH 7.4 as to make Ht 5%. Filterability was expressed as the volume (ml/min) of the specimen to pass through the polycarbonate sieve of nucleopore membrane with pore size $5\mu\phi$ under a negative pressure of 20 cm of H_2O . ATP content in the erythrocyte was measured by a conventional method of ATP-Kit (Eiken, Japan).

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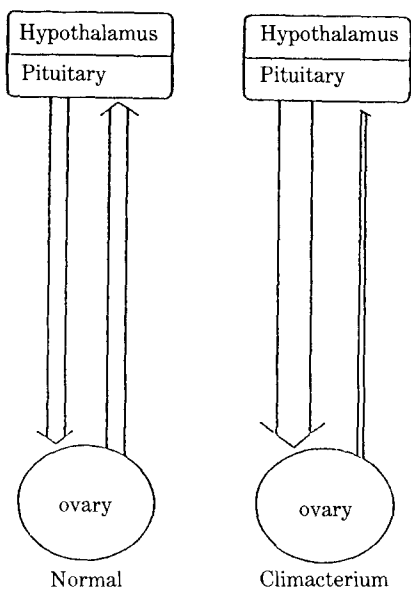


Fig. 1. Pathogenesis of climacterium

Table 2. Effect of Red Ginseng powder on climacteric complaints
 Patients: 83 cases with climacteric disturbances
 Dosage: 6.0g/day for 8 weeks
 Improvement of climacteric index

- %	80 ≤	~60	~30	~0	0 >	Total
No.	15	24	31	11	2	83
(%)	(18.1)	(28.9)	(37.4)	(13.2)	(2.4)	(100)

we studied effects of red ginseng power on menopausal symptoms of 83 women with climacteric disturbance.

As a result, ginseng was effective for 70 out of 83 patients (84.3%), whose menopausal symptoms decreased 30% or more as compared before and 8 weeks after (Table 2). Such marked effects of ginseng powder on menopausal women strongly suggested that it might relate to their ovarian function. We, hence, examined the various sex hormones before and after administration.

There was no change in prolactine (PRL) level and esterone (E_1) level. However, although there were no significant difference, we observed that FSH was tend to decrease and that E_2 was tend to increase²⁾ (Fig. 2).

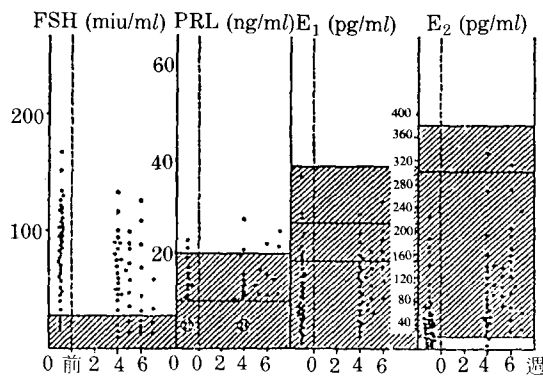


Fig. 2. Effect of Red Ginseng of endocrine system

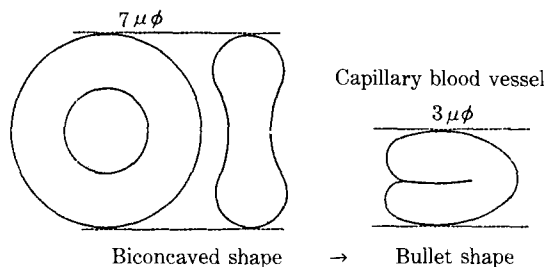


Fig. 3. Deformability of erythrocyte

This reason is not clear but ginseng might affect directly the pituitary gland to decrease FSH. However, it is more logical to consider that ginseng stimulated sex steroidogenesis in the ovary and accelerated the secretion of E_2 repressing the secretion of FSH. It may be due to a vasodilative action of ginseng, since many patients feel disappearing coldness in their extremities during administration of ginseng. The long acting of warmth is somewhat different from other vasodilators. Therefore, we studied its effects on a point view of erythrocyte deformability.

To maintain the microcirculation, red blood cell with a diameter of 7μ have to pass through the capillary vessel with a diameter of $3\mu\phi$. Red blood cell, therefore, is forced to deform its bi-concave shape to a bullet shape when it passes through peripheral tissues (Fig. 3).

In our earlier study on a pathogenesis of hemolytic disease of the newborn, we proved that neonatal jaundice was caused not only by immaturity of liver function but also by immaturity of spleen function to allow aged or less deformable red cells

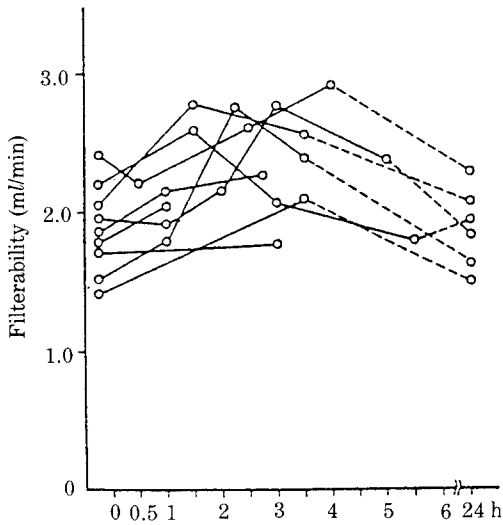


Fig. 4. Erythrocyte filterability after administration of Red Ginseng powder (4.5g)

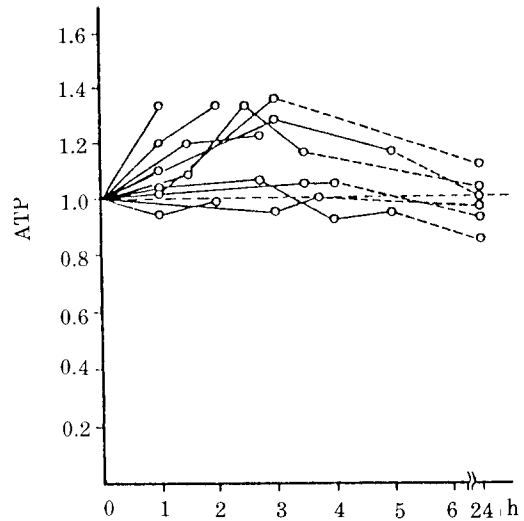


Fig. 6. ATP content in RBC after administration of Red Ginseng powder (4.5g)

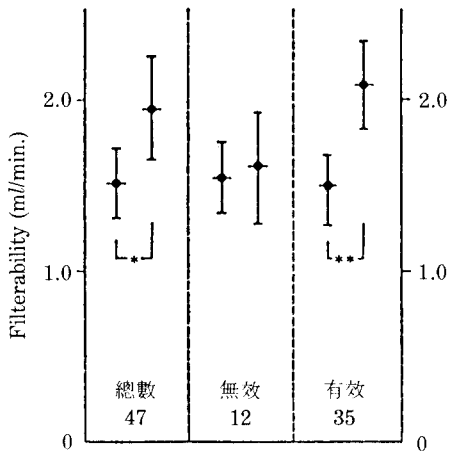


Fig. 5. Filterability after administration of Red Ginseng for one month.

to pass through narrow sieves in the spleen.^{3,5)}

Simulating the splenic structure, deformability or filterability was measured by using $5\mu\phi$ sized nucleopore membrane under a negative pressure of 20 cm H₂O. The fasting patients was given 4.5g ginseng powder and their erythrocyte filterability was measured periodically.

As a result, filterability increased with a peak after 2-3 hours, and then returned to the initial value gradually (Fig. 4).

Besides, the filterability after administration of

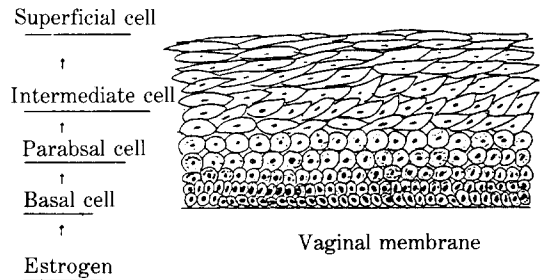


Fig. 7. Estrogen effect on the vaginal smear

ginseng for one month increased significantly. The most interesting and suggestive findings were that no significant difference was observed in the non-effective cases, while a significant increase was observed in the effective cases (Fig. 5).

In our earlier studies^{3,5)}, we observed that the deformability depended on pH, glucose level, temperature and ATP contents in the red blood cell. We, therefore, measured ATP contents before and after administration of ginseng powder periodically. ATP levels was increased just after administration of ginseng and decreased gradually which coincided with the pattern of deformability (Fig. 6).

Based on the effects of ginseng on the erythrocyte deformability, there was a possibility that the microcirculation in the ovary was improved and stimulated the steroidgenesis in the ovary, although

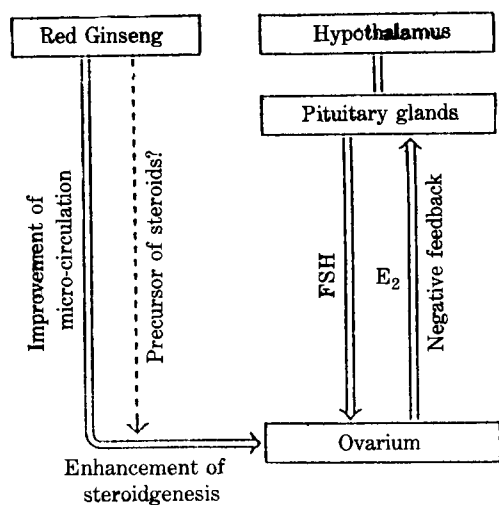


Fig. 8. Possible mechanism of action of Red Ginseng on climacteric disturbances

conventional hormone assays were failed to demonstrate significant changes 8 weeks after administration of ginseng powder. So, we studied it by a more sensitive biological method by means of the vaginal smear.

Genital organs, especially the vaginal membrane has receptors to estrogens. Estrogen proliferates basal membrane cells to superficial cells (Fig. 7). We can easily differentiate it by staining, that is, the estrogen affected cell stains red by red ink, while the deeper cell stains blue by blue ink.

We could observed successfully the estrogen effects in the atrophic vaginal smear of the post-menopausal women by appearing intermediate and superficial cell which stained faint red.

The result obtained indicates that administration of red ginseng powder caused an increase of estro-

gen, although available hormone assays failed to detect. Hence, a possible mechanism action of red ginseng powder on the climacteric symptoms could be safely explained as shown in Fig. 8.

We believe that red ginseng is an ideal medicine to overcome the climacteric disturbance, since it may ensure endogeneous sex steroids in those climacteric women who came short of sex steroids by the ovary due to aging.

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Literature Cited

1. Reid, H.R. *et al.*: *J. Clin. Pathol.*, **29**, 855 (1976).
2. Ogita, S.: *Yakuyo Ninjin '89-Advances in foudamental and clinical studies*-p.173, ed. Y. Yamamura and A. Kumagai, Kyouritu Shuppan, Tokyo (1989).
3. Ogita, S. *et al.*: *Europ. J. Pediatr.*, **127**, 67 (1978).
4. Ogita, S.: *Sanfujinka Ketueki*, **3**, 69 (1979).
5. Ogita, S.: Aged erythrocytes and neonatal jundice of the newborn. *Shougai Sanfujinkagaku*, ed. H. Murooka, Kanehara Shuppan, Tokyo (1984).