pump B off and pump A on, thus restarting the cycle. Dialyser blood compartment pressure fluctuates by less than 10 mm Hg during the cycle.

Six patients were studied. They were dialysed for six hours thrice weekly using Meltec Multipoint 1·0 m^2 dialysers, Dylade DII monitors able to produce positive dialysate pressure, and standard 15G needles with back eye. Dietary protein, sodium, potassium, and fluid intake were defined for each patient and remained constant. When conditions were stable single-needle dialysis was used for four weeks followed by two-needle dialysis for four weeks. During the first four-week period pump A was adjusted to give the maximum possible rate of inflow to the sac and pump B to provide a venous line pressure of 200 mm Hg. During two-needle dialysis maximum achievable blood flow was used.

All patients preferred the single single-needle system and no technical problems were encountered. Mean (±SEM) blood flow rate was only slightly lower during single needle dialysis (191·9±2·1 ml/min) than during two needle dialysis (212·1±2·2 ml/min) ($p<0·01$, Student's t test for paired data). The mean (±SEM) predialysis plasma concentrations at the end of single-needle and two-needle treatment periods respectively were as follows: urea 20·1±0·9 and 19·9±1·5 mmol/l (121±5 and 120±9 mg/100 ml); creatinine 785±31 and 771±41 μmol/l (8·9±0·4 and 8·7±0·5 mg/100 ml); potassium 4·75±0·21 and 4·58±0·21 mmol (mEq)/l. These differences were not significant. Haemoglobin concentration did not change significantly during the study. Ultrafiltration during single-needle dialysis was easily controlled by adjusting the dialysate pressure.

Comment

This single-needle system is as effective as conventional two-needle dialysis. It is easy to use, safe, and preferred by patients. The design allows comparatively high blood flow rates to be maintained, obviates distension of the dialyser, and prevents excessive pressure fluctuations in it, thus permitting the safe application of positive dialysate pressure to control ultrafiltration. We have also used this system with good effect in patients with acute renal failure, gaining circulatory access through a single percutaneous femoral vein catheter.

We thank the technical and nursing staff of Hanbury Dialysis Unit for their help with the development of this system.

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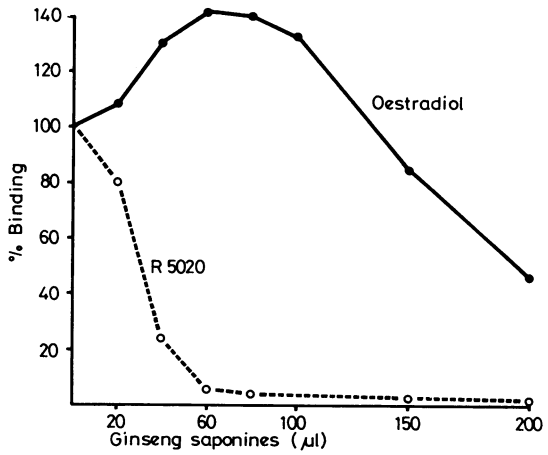
Oestrogen-like effect of ginseng

Ginseng has been known for thousands of years in the Far East as a stimulant. In recent years it has attracted interest in western countries. Its primary action, however, remains uncertain. We report an oestrogen-like effect of ginseng on the vaginal epithelium and competition by ginseng saponines with 17-oestradiol and R5020 for binding to human myometrial receptor proteins.

Case report

The patient was a 62-year-old woman who, 14 years before, had undergone supravaginal uterine amputation and bilateral ovarectomy for uterine myomas. Generally she had been in good health. A vaginal smear showed a strong oestrogenic effect with a maturation index of 0/65/35 (parabasal/intermediate/superficial cells). She had never taken oestrogens. During the past year, however, she had taken Rumanian ginseng and Gerovital alternatively, each for periods of two weeks. The treatment was stopped and after three weeks the vaginal smear showed a maturation index of 0/95/5. Two weeks later the index was 0/100/0 and the serum concentration of oestrone was 0·32 nmol/l (86·5 pg/ml), of oestradiol 0·03 nmol/l (8·2 pg/ml), and of oestriol <0·01 nmol/l (<2·4 pg/ml) measured by radioimmunoassay.[1] Gerovital was then given again for two weeks, when the maturation index was 0/99/1 and the serum concentrations of oestrone 0·33 nmol/l (89·2 pg/ml), oestradiol 0·02 nmol/l (5·4 pg/ml), and oestriol <0·01 nmol/l (<2·9 pg/ml). Gerovital was stopped and ginseng given instead for two weeks. The maturation index after the two weeks on ginseng was 0/90/10 and the serum concentrations of oestrone 0·40 nmol/l (108·2 pg/ml), oestradiol 0·03 nmol/l (8·2 pg/ml), and oestriol <0·01 nmol/l (<2·9 pg/ml). The vaginal and cervical epithelium looked normal and there were no atrophic changes. The spinnbarkeit was about 5 cm and there was no arborisation. Gas chromatography analysis of the tablets the patient had taken showed no oestrogens. We found, however, that the crude methanolic extract of ginseng competed very strongly with 17-oestradiol and R5020 for the oestrogen and progesterone binding sites in the human myometrial cytosol (figure).



Effect of ginseng saponines on binding of 17-oestradiol and R5020 to human myometrial oestrogen and progesterone receptors.

Comment

Despite the oestrogenic effect evident in the vaginal smear we found no oestrogens in ginseng. Likewise the serum concentrations of oestrone, oestradiol, and oestriol did not change during treatment with ginseng. Many of the reported effects of ginseng are similar to those of oestrogens. Both are stimulants and give a feeling of well being.[2] Mastalgia with diffuse nodularity has been reported in postmenopausal women after taking ginseng and after taking oestrogens.[3] Ginseng also seems to stimulate corticotrophin secretion and to increase RNA and protein synthesis in the liver.[4 5] This stimulation of liver RNA and protein synthesis is said to be due to the hormone-like effect of the saponine glycosides in ginseng.[5] It is well established that the response of steroid target cells depends on the binding of the hormone to specific cytoplasmic receptor proteins. The subsequent nuclear translocation of the hormone-receptor complex and the binding to the chromatin results in gene activation and increased RNA biosynthesis. Can the ginseng saponines interact with hormone receptor proteins in a similar way to ovarian steroids?

Panax ginseng contains at least 13 different saponine glycosides, with a nucleus that resembles the steroid nucleus. The main functional groups of the steroids are the 3-OH and 17-OH groups. A highly positive contribution to the binding is also provided by the steroid nucleus. The binding of hormones to their receptors, however, is complex. Thus the uterine cytosol receptors also bind non-steroid molecules such as diethylstilboestrol, benzoestriol, and cyclophenyl. Whether or not the oestrogen-like effects of ginseng are mediated through a mechanism that includes receptor proteins has to be elucidated. At present we are studying more closely the interaction of the different saponine glycosides with uterine receptor proteins.

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