

여성에서 혈청 Osteoprotegerin 농도와 골대사 및 심혈관계질환 위험인자의 관련성

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목적 : 여성에서는 연령증가와 폐경에 따라 골흡수가 항진되고 심혈관계질환의 위험이 증가되어 골다공증 및 심혈관계질환 발병률이 증가된다. OPG는 RANKL의 decoy receptor로 골흡수의 중요한 억제인자이며 동맥석회화에도 관련된 인자이다. 연구자들은 여성에서 순환하는 OPG와 골대사 및 심혈관계질환의 위험인자와의 상호관계를 관찰하였다.

방법 : 건강한 286명의 여성(평균 연령, 51.5 ± 6.9 세; 연령 범위, 37-73세)에서 혈청 OPG 농도, 연령, 혈압, 체질량지수, 허리엉덩이둘레비(WHR), 공복 혈당, 혈청 지질, 생화학적 골교체표지자, 혈청 FSH 농도 및 DEXA로 요추골과 대퇴골 경부 골밀도를 측정하였다.

결과 : 1. 혈청 OPG 농도는 고연령(1366.4 ± 400.5 pg/mL Vs. 1259.8 ± 394.8 pg/mL, $p < 0.05$)과 복부비만(1262.9 ± 403.8 pg/mL Vs. 1378.4 ± 369.7 pg/mL, $p < 0.05$)에서 높았다. 혈청 OPG 농도는 연령($r=0.157$, $p < 0.01$), WHR ($r=0.134$, $p < 0.05$), 총콜레스테롤($r=0.175$, $p < 0.01$) 및 저밀도지단백 콜레스테롤($r=0.176$, $p < 0.01$)과 상관관계가 있었다.

2. 혈청 OPG 농도는 요추골과 상관관계가 있었으며($r=0.128$, $p < 0.05$), DPD와는 경향만 관찰되었고($r=0.105$, $p=0.076$), 요추골 및 대퇴골 경부 골밀도와는 연관성이 없었다.

3. 폐경후 여성에서 폐경전 여성보다(1226.3 ± 405.9 pg/mL Vs. 1358.5 ± 380.0 pg/mL, $p < 0.001$) 혈청 OPG 농도가 11% 높았고, 혈청 OPG 농도는 혈청 FSH 농도와 상관관계가 있었다($r=0.172$, $p < 0.01$).

결론 : 여성에서 여성호르몬이 골교체표지자와 심혈관계질환의 위험인자의 변화를 동시에 반영하는 데는 OPG를 통한 기전이 일부 관여할 것으로 생각된다.

Effects of phytoestrogen on the markers of bone metabolism in pre-menopausal women

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Bone density in young age is important to predict osteoporosis in old age. After reaching a peak bone mass, gradual bone loss will occur. Previous studies have shown that phytoestrogen has several kinds of beneficial effects. But there are still different reports about its effects on bone metabolism and there are only a few studies in pre-menopausal women. So we performed this study to find out the effect of phytoestrogen on bone metabolism in pre-menopausal women. Our study was designed as double-blind placebo controlled prospective study. Pre-menopausal women with the ages between 30 - 40 years were enrolled in our study. They were randomly assigned to receive either isoflavone capsule (isoflavone 120mg/capsule, n=35) or capsule containing lactose as placebo (control, n=26) once a day for 3 menstrual cycles. Before intervention, the characteristics of the study subjects were similar. Among them, 4 subjects gave up because of side effects (breast pain and weight gain) in isoflavone group and 1 subject in control group gave up due to pregnancy. After ingestion of isoflavone, urinary excretion of daidzein and genistein were significantly higher in isoflavone group than control group ($p=0.008$ and 0.036 , respectively). In isoflavone group, serum osteocalcin level was significantly increased ($p=0.036$), and urinary excretion of deoxypyridinoline was decreased but not significant. In conclusion, isoflavone with the dose of 120mg/day showed significant change of bone formation marker. We can conclude that phytoestrogen may have the possibility of beneficial effect on bone metabolism in pre-menopausal women. But this possibility should be confirmed by the long-term study with the measurement of actual changes of bone mass and fracture incidence in the near future.