

A prospective population-based study of menopausal symptoms in Korean women

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ABSTRACT

Objective: To evaluate the clinical characteristics of climacterium in Korean women, by their age onset of menopause, climacteric complaints, changes of bone mineral densities, biochemical bone markers and lipid profiles.

Methods: Two hundred thirty three climacteric women were classified in 4 groups according to age (Group I below 50 years, Group II 51–55 years, Group III 56–60 years, Group IV over 61 years). Their climacteric symptoms were assessed and recorded. Bone mineral densities were checked, and serum biochemical bone markers and lipid profiles were measured.

Results: The mean age of menopause was 48.4 ± 4.0 years old. The most common symptoms of Korean climacteric women were backache, arthralgia, hot flushes and urinary frequency in order. The bone mineral densities of these climacteric women were significantly decreased with advancing age. The serum alkaline phosphatase, a biochemical marker of bone turnover was significantly elevated with increasing age. The serum level of total cholesterol, LDL-cholesterol and triglycerides also showed an increasing tendency, while HDL-cholesterol decreased by increasing age. The serum level of total calcium and uric acid, however, did not vary between the groups studied.

Conclusions: Advancing age appears to have significant effect with a decrease of bone mineral densities and alterations of lipid profiles in Korean climacteric women.

Keywords: Climacteric, Menopause, Premenopause, Postmenopause

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INTRODUCTION

The climacterium implies the time before, during and after menopause. The midlife years of 45–55 coincide with those of menopausal transition, and studies of middle aged women suggest that they are highly symptomatic¹. This period is associated with a varying degree of somatic and physiological changes that reflect alteration in normal functioning of the ovary. The true clinical features of menopause was determined by Utian² by comparing prevalences of symptoms between women who had hysterectomies with and without ovarian removal, and investigated

the alleviation of symptoms when oral estrogen was given in a single blind crossover trial. The only symptoms directly associated with oophorectomy and oral estrogen alleviation were vasomotor symptoms (hot flushes and perspiration) and those consistent with atrophic vaginitis (dyspareunia, blood-stained vaginal discharge). The symptoms and the problems included are hot flushes, menstrual irregularities, palpitation, sleep disturbance, frequent urination, dyspareunia, osteoporosis and cardiovascular disease. The climacteric period may have an insidious or abrupt onset, usually in the mid-to late forties.

This study was therefore undertaken to evaluate the clinical characteristics of Korean climacteric women, age at onset of menopause, the incidence of symptoms, changes in bone mineral densities and its effect on biochemical markers of bone turnover.

MATERIALS AND METHODS

Between May 1995 and October 1997, two-hundred-thirty-three Korean climacteric women were recruited and participated in this retrospective study. The characteristics of subjects are shown in Table 1. Women who had been on hormone replacement therapy or those who had undergone hysterectomy or oophorectomy were excluded from analysis. For analysis, women were divided into 4 groups. Group I comprised women below 50 years, Group II comprised women between 51 and 55 years old, Group III between 56 and 60 years old, Group IV over 60 years (Table 2). The climacteric symptoms of each of these women were assessed and recorded by obtaining their medical history. The patients' symptoms that typically attributed to the menopause were asked and recorded. Bone mineral densities were measured by anterior-posterior (A-P) and lateral view of lumbar; neck and Ward's triangle of femur using dual energy X-ray absorptiometry (DXA, QDR-2000®) Hologic Co.). The serum concentration of osteocalcin, alkaline phosphatase and excretion of urinary deoxy pyridinoline levels were measured by commercially available kit. (osteocalcin by OSCA test® osteocalcin kit of Boehringer Mannheim®, alkaline phosphatase by BM/Hitachi® 747/737 and deoxy pyridinoline by Gamma BCT DPD flow Diagram® kit of Immuno Diagnostic System).

The concentrations of each of these values were compared according to different age group. Values were reported as mean \pm S.D. For statistical analysis of data, the ANOVA test was used. Values of $p < 0.05$ were considered as significant.

TABLE 1
Age distribution of each groups

Groups	Age distribution	No.
I	below 50	97
II	51-55	60
III	56-60	32
IV	above 60	44

TABLE 2
Profiles of climacteric women

Age	53.6 \pm 7.9
Parity	3.2 \pm 1.7
Height (Cm)	155.0 \pm 5.8
Weight (Kg)	57.5 \pm 7.9

Mean \pm S.D.

RESULTS

The mean age of total subjects was 48.8 ± 4.0 years old. The incidence of climacteric symptoms according to different groups were hot flushes (46%), backache (44%), arthralgia (32%) in group I. Backache (54%), arthralgia (46%), hot flushes (44%), frequent urination (28%) in group II. Backache (88%), frequent urination (63%), arthralgia (59%), hot flushes (44%) in group III. Backache (79%), arthralgia (60%), frequent urination (34%), insomnia (25%), hot flushes (16%) in group IV. The incidence of climacteric symptoms of all patients regardless of age were backache (60%), arthralgia (46%), hot flushes (37%), frequency in urination (33%), anxiety (24%), palpitation (22%), insomnia (22%), loss of memory (22%), urinary incontinence (16%) in order (Fig. 1).

The bone mineral densities of each group showed a significant decreasing tendency according to different age groups (Table 3). Among the biochemical markers of bone turnover the total alkaline phosphatase levels were significantly elevated with increasing age ($p < 0.05$). It is noteworthy that women from groups III (56-60 years) and IV (> 60 years) had mean \pm S.D. levels of alkaline phosphatase at 92.6 ± 35.7 and 93.7 ± 32.2 IU/L which was significantly higher than those from younger climacteric Korean women of groups I and II (< 60 years of age) whose levels were 72.7 ± 21.1 and 78.9 ± 27.3 IU/L, respectively (Table 4). In contrast, however, no significant difference in serum osteocalcin (bone Gla protein) and urinary deoxy pyridinoline excretion (Table 4).

TABLE 3
The changes of bone mineral densities by DXA of each group (unit; g/cm²)

	Lumbar (AP)*	Lumbar (lateral)*	Femur (neck)*	Femur (Ward's)*
Group I	0.966 ± 0.127	0.749 ± 0.087	0.709 ± 0.088	0.607 ± 0.127
Group II	0.856 ± 0.133	0.679 ± 0.089	0.666 ± 0.098	0.523 ± 0.114
Group III	0.811 ± 0.119	0.621 ± 0.080	0.608 ± 0.084	0.428 ± 0.104
Group IV	0.736 ± 0.117	0.585 ± 0.095	0.551 ± 0.093	0.398 ± 0.145
Mean	0.873 ± 0.153	0.682 ± 0.109	0.654 ± 0.108	0.519 ± 0.149

*; p < 0.05

TABLE 4
The changes of the biochemical markers of bone turnover

	BGP	DPD	TAP*
Group I	18.1 ± 15.0	7.29 ± 5.78	72.7 ± 21.1
Group II	21.3 ± 17.4	6.24 ± 2.91	78.9 ± 27.3
Group III	18.6 ± 17.4	7.22 ± 2.49	92.6 ± 35.7
Group IV	21.5 ± 17.5	7.13 ± 3.35	93.7 ± 32.2
Mean ± S.D.	19.7 ± 16.4	6.97 ± 4.44	81.7 ± 28.5

*p < 0.05

BGP; bone Gla protein, serum osteocalcin (ng/mL)

DPD; urinary deoxypyridinoline excretion (nM/DPD/mM Creatinine)

TAP; total alkaline phosphatase (IU/L)

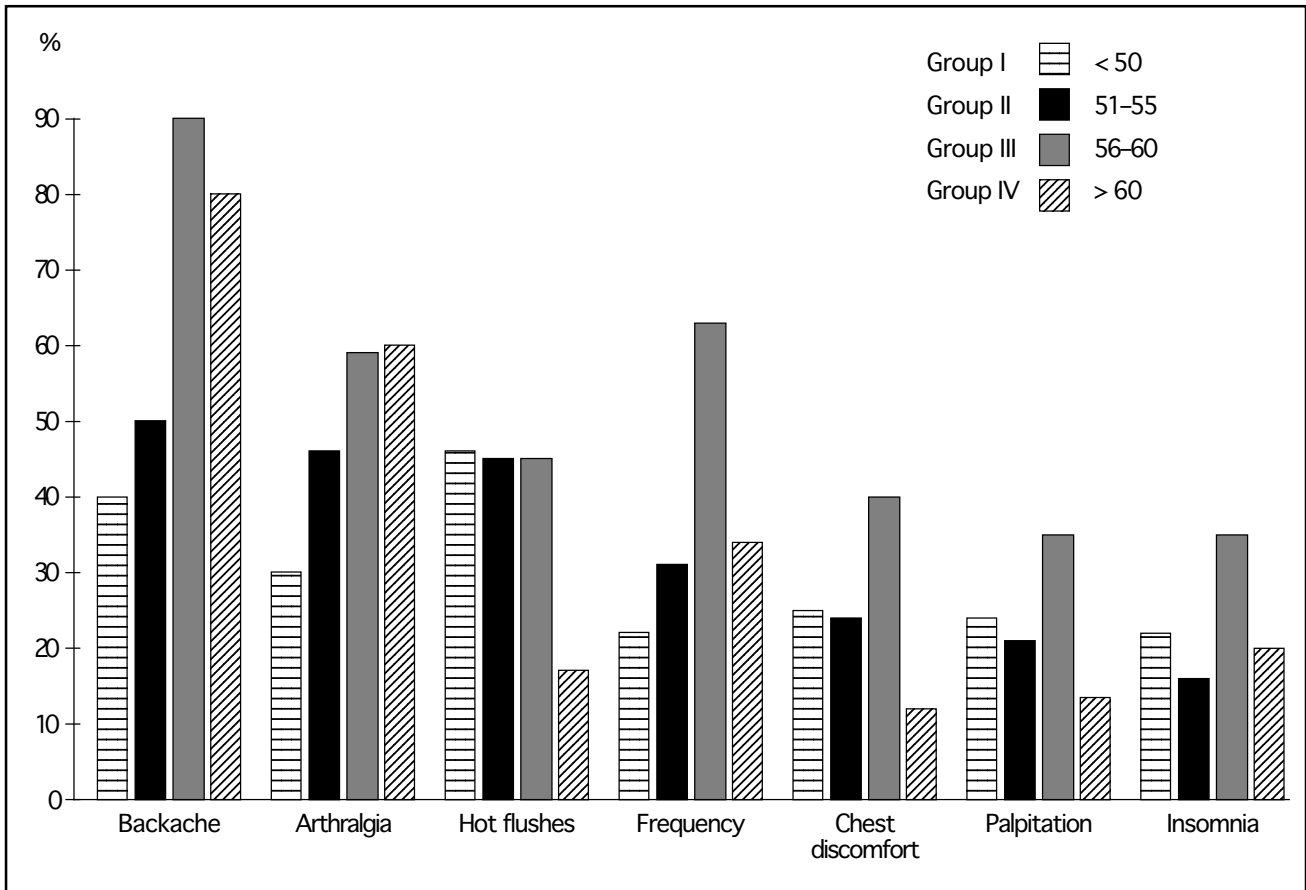


Fig. 1 Incidence of climacteric symptoms of Korean women from each group.

DISCUSSION

The average age onset of natural menopause in Korean women is reported to be around 47.6 years³, while in England and America, it is reported to be around 51 years. The different age onset of menopause is influenced by different socioeconomical status in each families and cultural differences. It has recently been reported that the onset age of menopause is increasing⁴⁻⁵.

Our study demonstrated that the average age at menopause was 48.4 ± 4.0 years. Sugiyama⁶ reported that about 45 percent of menopausal women in Japan experience menopausal symptoms during their climacteric periods. According to American and Canadian studies⁷, hot flashes were the most frequent symptom accounting for about 55%. In English studies, irritability and arthralgia were the most frequent symptoms. The common climacteric symptoms of Korean climacteric women in our study was reported to be back pain, arthralgia, hot flushes, frequent urination, palpitation, and insomnia, in that order.

It has been reported that bone mineral densities decline abruptly after menopause thus the risk of osteoporosis increases⁸. As the low bone mineral densities are known to be an important risk factor in anticipating fractures due to osteoporosis, bone mineral density measurements are regarded to be an essential tool in anticipating risk of fracture⁹⁻¹⁰. The composition of trabecular bone in the lumbar area is 66%, and 100% in Ward's triangle. The bone mineral density measurement in climacteric women should be focused on measuring bone with abundant trabecular bone, thus the ulnar bone at its distal portion and the lumbar are appropriate sites.

In our study, we measured the bone mineral densities in lumbar A-P, lateral and neck portion of the femur and in Ward's triangle. It has been reported that the bone mineral densities decrease dramatically after menopause¹². This study also showed that bone mineral densities decreased significantly in each area according to increasing age. The level of serum osteocalcin is low before menopause and increases after menopause. It again declines in the sixties and seventies but still is higher than the premenopausal level. The level of serum total alkaline phosphatase increases after menopause and is higher in postmenopausal osteoporosis patients. Excretion rate of urinary deoxyypyridinoline is highest within one year

after menopause and thereafter decreases. The bone turnover rate is significantly increased within 1-3 years after menopause and decreases gradually within 8-10 years¹³.

Among the metabolic markers, serum osteocalcin and the urinary excretion of deoxyypyridinoline did not show any significant change according to decreasing age. Total serum alkaline phosphatase increased significantly.

The prevalence of cardiovascular disease is reported to increase dramatically after menopause compared to premenopause, and this can be related to the change of serum lipid metabolism by deficiency of the endogenous estrogen¹⁴⁻¹⁵. It is reported that if serum total cholesterol level decreases 1% and LDL-cholesterol decreases 11%, the risk rate of coronary heart disease decreases 2% and 19% respectively. If HDL-cholesterol increases 1 mg/dL, the risk of coronary heart disease decreases 3-5%. The standard level of serum lipid to prevent cardiovascular disease is to maintain total cholesterol under 200 mg/dL, HDL-cholesterol over 35mg/dL, and triglycerides under 250 mg/dL¹⁷.

A decreasing pattern of HDL-cholesterol is observed in postmenopausal women and 70% of total cholesterol comprises LDL-cholesterol which is a significant predisposing factor for cardiovascular disease. The change of lipid profile according to the age of Korean menopausal women is reported to show an increasing tendency according to increasing age but not statistically significant. The serum HDL-cholesterol indicated a statistically significant decreasing tendency, while LDL-cholesterol revealed an increasing tendency according to increasing age but not statistically significant. The serum triglycerides level did not differ according to increasing age¹⁸.

In our study, total cholesterol and triglycerides increased with increasing age. HDL-cholesterol decreased after the peak value in women aged 51-55 years. LDL-cholesterol increased to the lowest level in women aged between 51-55 years. However, these changes had no statistical significance.

Hyperuricemia is reported to be associated with hypertension, hyperlipidemia, obesity, glucose intolerance¹⁹. In our study we found no evidence that the total serum calcium level and the uric acid were affected by the age of the patient.

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