Prevalence and Related Factors assessment of Osteoporotic Fracture in Rural Population: the Korean Genomic Rural Cohort study

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INTRODUCTION

Objective: Due to the increase in the elderly population, osteoporosis and related fractures are increasing and causes serious social problems such as lower quality of life of seniors and economic loss. This study is aimed towards the general population in rural areas for prevalence and related risk factors of osteoporotic fracture.

METHODS

The research comes from the Korean Rural Genomic Cohort study consisting of 10,111 people, 4,090 men and 6,021 women, ranging from 40 to 70 years old from rural areas in Korea. The questionnaire results show that 907 men experienced fractures with 208 fractures due to osteoporosis. 1,058 women experienced fractures with 603 fractures due to osteoporosis. Fractures and related clinical factors were collected through questionnaire, bone mineral density was measured with heel quantitative ultrasound, and osteoporotic fracture groups were statistically analyzed.

Korean Rural Genomic Cohort(KRGC) study

KRGC study*
Duration:2005 – 2007

Wonju, Pyeong-Chang, Naju, Keum-San, Kang-reung

Total participants: 10,111

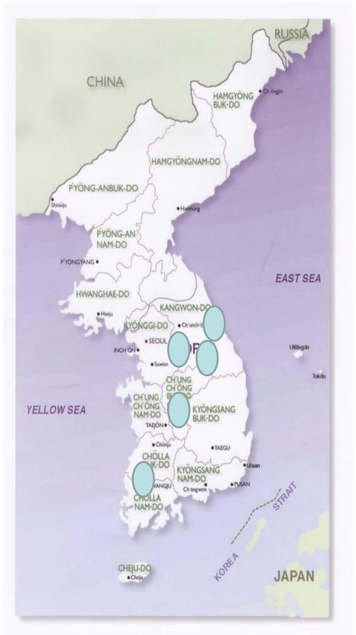
Male: 4,090 | female 6,021

Total fracture: 1,966

Osteoporotic fracture: 792

Exclusion: non-osteoporotic fracture: 1,174

* CDC in Korea



Risk factors assessment

Risk factor questionnaire - Alcohol intake, Smoking, Parental history of fracture, medical disease affected osteoporosis, medications related osteoporosis, menstural history

Clinical examination – weight, height, weist and hip ratio

Body fat assessment – impedance method (Inbody 2.0)

QUS measurement – heel ultrasound (GE lunar, achilles)

Statistical analysis

- Univariate chi-square , unpaired t-test, and ANOVA test between osteoporotic fracture group and non-fracture group
- Multivariate Logistic regression analysis of risk factors
- P-value <0.05

Osteoporotic fracture subjects of study participants

Total: 8,937
Fracture: 792 (8.9%)
Non-fracture 8,145

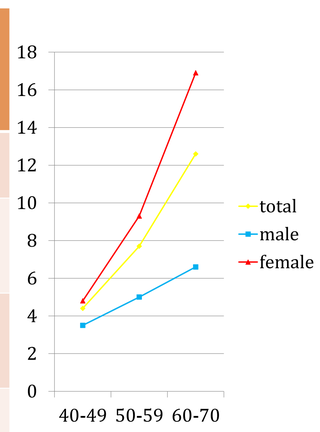
Male
Total: 3,364
Fracture: 182 (5.4%)
Non-fracture: 3,182

Female
Total: 5,573
Fracture: 610 (10.9%)
Non-fracture: 4,963

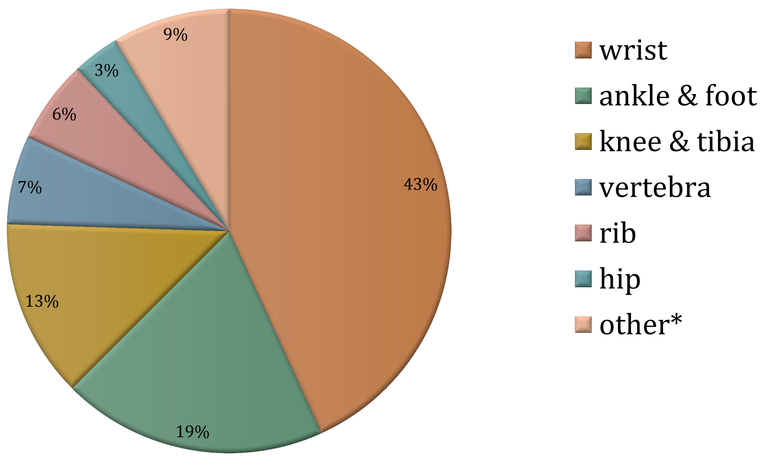
RESULTS

Prevalence of osteoporotic fracture in ages

Age (years)	Total Fx/total subjects (%)	Male Fx/total subjects (%)	Female Fx/total subjects (%)
40-49	96/2,183 (4.4)	24/681 (3.5)	72/1,502 (4.8)
50-59	245/3,172 (7.7)	60/1,191 (5.0)	185/1,981 (9.3)
60-70	451/3,582 (12.6)	98/1,492 (6.6)	353/2,090 (16.9)
Total	792/8,937 (8.9)	182/3,364 (5.4)	610/5,573 (10.9)



Proportion of fracture site in whole study population



*other included in fracture of shoulder, clavicle, and hand

Baseline characteristics in whole study population by fracture status

`	Fracture group (n=792)	Non-fracture group (n=8,145)	P-value
Age (years)	59.43±7.33	56.01±8.16	.000
Weight (kg)	59.09±9.61	61.58±9.98	.000
Height (cm)	155.60±7.92	158.59±12.98	.000
Body mass index(kg/m^2)	24.43±3.47	24.58±3.29	.246
Waist circumference (cm)	88.14±66.30	90.86±82.83	.376
Hip circumference (cm)	100.29±72.94	102.29±82.19	.514
*W/H ratio	0.8832±0.77	0.8801±0.68	.227
Muscle amount (kg)	37.62±6.39	40.24±7.25	.000
Body fat amount (kg)	18.22±5.12	18.00±5.48	.275
Visceral fat amount (kg)	2.44±1.25	2.45±2.13	.900

*W/H ratio stand for waist circumference /hip circumference ratio

Multivariate logistic regression analysis of clinical risk factors in whole study population

parameters	Odds ratio	P-value	95% CI
age	1.052	.000	1.041-1.064
sex	2.665	.000	1.872-3.794
Ex-smoker	1.946	.000	1.595-2.374
Current smoking	1.268	.139	0.926-1.737
Current drinking	1.155	.098	0.974-1.370
Body mass index	0.990	.492	0.962-1.019
Muscle amount	1.001	.945	0.979-1.023
Stiffness index	0.982	.000	0.977-0.988
Fracture Hx. of parent	1.525	.000	1.235-1.882

Multivariate logistic regression analysis of clinical risk factors in men

parameters	Odds ratio	P-value	95% CI
age	1.024	.028	1.003-1.047
Ex-smoker	0.840	.352	0.582-1.213
Current smoking	0.679	0.051	0.460-1.002
Current drinking	1.184	.307	0.856-1.636
Body mass index	1.012	.687	0.953-1.075
Muscle amount	0.987	.478	0.950-1.024
Stiffness index	0.985	.002	0.976-0.995
Fracture Hx. of parent	1.558	.055	0.991-2.451

Multivariate logistic regression analysis of clinical risk factors in women

parameters	Odds ratio	P-value	95% CI
age	1.055	.000	1.033-1.078
Ex-smoker	2.814	.000	2.218-3.570
Current smoking	2.373	.005	1.296-4.346
Current drinking	1.089	.443	0.876-1.355
Body mass index	0.984	.355	0.951-1.018
Muscle amount	1.009	.552	0.980-1.038
Stiffness index	0.980	.000	0.973-0.987
Fracture Hx. of parent	1.453	.004	1.126-1.875
Duration after menopause	1.008	.373	0.990-1.027

CONCLUSION

Osteoporotic fracture prevalence is 8.9%, with women having significant correlation factors in age, bone density T-score, family history of osteoporotic fracture, and smoking habits

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The researchers claim no conflicts of interest.