中国骨质疏松杂志 2013 年 5 月第 19 卷第 5 期 Chin J Osteoporos, May 2013, Vol 19, No. 5
Published online www. wanfangdate. com. cn doi:10. 3969/j. issn. 1006-7108. 2013. 05. 006

·论著·

行经寿命对绝经后妇女骨密度的影响

李慧林* 朱汉民 程群 杜艳萍 洪维 朱晓颖 张雪梅 薛思红
(华东医院,上海 200040)

中图分类号: R681 **文献标识码**: A **文章编号**: 1006-7108(2013)05-0446-04

摘要: **目的** 行经寿命对绝经后妇女骨密度影响。**方法** 对 2004 年 2 月至 2010 年 2 月来我院进行双能 χ 线骨密度仪测定骨密度(BMD)的绝经后女性 2304 例;按每 10 岁一个年龄段进行分组,分别比较行经寿命≤30 年、30 ~ 40 年、≥40 年各组妇女腰椎、髋部骨密度。**结果** 1. 在 腰椎 1 ~ 4 BMD:小于 60 岁组分别为(0. 782 ± 0. 127) g/cm^2、(0. 857 ± 0. 133) g/cm^2、(0. 881 ± 0. 120) g/cm^2;60 ~ 69 岁组(0. 784 ± 0. 130) g/cm^2、(0. 788 ± 0. 139) g/cm^2、(0. 842 ± 0. 130) g/cm^2;70 ~ 79 岁组(0. 753 ± 0. 144) g/cm^2、(0. 773 ± 0. 149) g/cm^2、(0. 799 ± 0. 167) g/cm^2;≥80 岁组(0. 725 ± 0. 096) g/cm^2、(0. 825 ± 0. 162) g/cm^2、(0. 774 ± 0. 150) g/cm^2。其中小于 60 岁组中行经寿命≥40 年和 30 ~ 40 年 BMD 明显高于行经寿命≤30 年组,差异有统计学意义(P≤0. 001);60 ~ 69 岁组中行经寿命≥40 年 BMD 明显高于行经寿命 30 ~ 40 年,差异有统计学意义(P≤0. 01)。2. 髋部各部位骨密度 股骨颈:小于 60 岁组(0. 649 ± 0. 093) g/cm^2、(0. 688 ± 0. 102) g/cm^2、(0. 690 ± 0. 087) g/cm^2;60 ~ 69 岁组(0. 621 ± 0. 114) g/cm^2、(0. 625 ± 0. 094) g/cm^2、(0. 642 ± 0. 096) g/cm^2;70 ~ 79 岁组(0. 572 ± 0. 102) g/cm^2、(0. 570 ± 0. 098) g/cm^2、(0. 609 ± 0. 088) g/cm^2;≥80 岁组(0. 545 ± 0. 078) g/cm^2、(0. 565 ± 0. 094) g/cm^2、(0. 539 ± 0. 099) g/cm^2。大转子:小于 60 岁组(0. 557 ± 0. 084) g/cm^2、(0. 589 ± 0. 104) g/cm^2、(0. 601 ± 0. 083) g/cm^2;60 ~ 69 岁组(0. 535 ± 0. 102) g/cm^2、(0. 533 ± 0. 960) g/cm^2、(0. 562 ± 0. 091) g/cm^2;70 ~ 79 岁组(0. 472 ± 0. 095) g/cm^2、(0. 480 ± 0. 094) g/cm^2、(0. 551 ± 0. 098) g/cm^2;≥80 岁组(0. 458 ± 0. 074) g/cm^2、(0. 470 ± 0. 096) g/cm^2、(0. 452 ± 0. 110) g/cm^2。全髋:小于 60 岁组(0. 782 ± 0. 108) g/cm^2、(0. 821 ± 0. 111) g/cm^2、(0. 829 ± 0. 102) g/cm^2;60 ~ 69 岁组(0. 750 ± 0. 114) g/cm^2、(0. 752 ± 0. 114) g/cm^2、(0. 779 ± 0. 113) g/cm^2;70 ~ 79 岁组(0. 679 ± 0. 119) g/cm^2、(0. 686 ± 0. 117) g/cm^2、(0. 768 ± 0. 102) g/cm^2;≥80 岁组(0. 647 ± 0. 080) g/cm^2、(0. 665 ± 0. 115) g/cm^2、(0. 643 ± 0. 127) g/cm^2。其中小于 60 岁组中行经寿命 30 ~ 40 年股骨颈、全髋和大转子 BMD 明显高于行经寿命≤30 岁,差异有统计学意义(P≤0. 05);70 ~ 80 岁组行经寿命≥40 年全髋 BMD 明显高于行经寿命≤30 年,差异有统计学意义(P < 0. 001)。≥80 岁组各组行经寿命在腰椎和髋部各部位 BMD 差异无统计学意义。**结论** 行经寿命影响绝经后低、中龄老人妇女骨密度,而高龄老人骨密度不受行经寿命影响。

关键词: :行经寿命;绝经后妇女;骨密度

Effect of the duration of menstrual cycle on bone mineral density in postmenopausal women

LI Huilin, ZHU Hanmin, CHENG Qun, DU Yanping, HONG Wei, ZHU Xiaoyin, ZHANG Xuemei, XUE Sihong
(Department of Osteoporosis, Huadong Hospitail, Fudan University, Research Unit of Geriatric Bone Disease of Shanghai Geriatrics Institute, Shanghai 200040, China)
Corresponding author: LI Huilin, Email: sirius1121@ hotmail. com

Abstract: **Objective** To investigate the effect of the duration of menstrual cycle on bone mineral density (BMD) in postmenopausal women. **Methods** BMD of 2304 postmenopausal women, who came to our hospital from February 2004 to February 2010, was detected using Hologic DephiA dual energy X-ray absorptiometry (DXEA). All subjects were divided into groups according to a 10-year division. BMD of the lumbar vertebrae and the hip in duration of menstrual cycle ≤30-year group, 30-40-year group, and ≥40-year group was compared. **Results** BMD of L_{1-4} in women younger than 60 years old was 0. 782 ± 0. 127 g/cm^2, 0. 857 ± 0. 133 g/cm^2, and 0. 881 ± 0. 120 g/cm^2, respectively; 0. 784 ± 0. 130 g/cm^2, 0. 788 ± 0. 139 g/cm^2, and 0. 842 ± 0. 130 g/cm^2, in 60 - 69 years old group, respectively; 0. 753 ± 0. 144 g/cm^2, 0. 773

*通讯作者:李慧林, Email: sirius1121@ hotmail. com

±0.149 g/cm^2, and 0.799 ±0.167 g/cm^2, in 70 – 79 years old group, respectively; 0.725 ±0.096 g/cm^2, 0.825 ±0.162 g/cm^2, and 0.774 ±0.150 g/cm^2, in older than 80 years old group, respectively. In patients younger than 60 years old, BMD of the lumbar vertebrae in ≥40-year group and in 30-40-year group was significantly higher than that in ≤30-year group (P≤0.001). In patients with the age of 60-69 years old, BMD of the lumbar vertebrae in ≥40-year group was significantly higher than that in 30-40-year group (P≤0.01). BMD of the femur neck in patients younger than 60 years old was 0.649 ±0.093 g/cm^2, 0.688 ±0.102 g/cm^2, and 0.690 ±0.087 g/cm^2, respectively; 0.621 ±0.114 g/cm^2, 0.625 ±0.094 g/cm^2, and 0.642 ±0.096 g/cm^2, in 60-69 years old group, respectively; 0.572 ±0.102 g/cm^2, 0.570 ±0.098 g/cm^2, and 0.609 ±0.088 g/cm^2, in 70-79 years old group, respectively; 0.545 ±0.078 g/cm^2, 0.565 ±0.094 g/cm^2, and 0.539 ±0.099 g/cm^2, in patients older than 80 years old, respectively. BMD of the Torch area in patients younger than 60 years old was 0.557 ±0.084 g/cm^2, 0.589 ±0.104 g/cm^2, and 0.601 ±0.083 g/cm^2, respectively; 0.535 ±0.102 g/cm^2, 0.533 ±0.960 g/cm^2, and 0.562 ±0.091 g/cm^2, in 60-69 years old group, respectively; 0.472 ±0.095 g/cm^2, 0.480 ±0.094 g/cm^2, and 0.551 ±0.098 g/cm^2, in 70 – 79 years old group, respectively; 0.458 ±0.074 g/cm^2, 0.470 ±0.096 g/cm^2, and 0.452 ±0.110 g/cm^2, in patients older than 80 years old, respectively. BMD of the total in patients younger than 60 years old was 0.782 ±0.108 g/cm^2, 0.821 ±0.111 g/cm^2, and 0.829 ±0.102 g/cm^2, respectively; 0.750 ±0.114 g/cm^2, 0.752 ±0.114 g/cm^2, and 0.779 ±0.113 g/cm^2, in 60-69 years old group, respectively; 0.679 ±0.119 g/cm^2, 0.686 ±0.117 g/cm^2, and 0.768 ±0.102 g/cm^2, in 70 – 79 years old group, respectively; 0.647 ±0.080 g/cm^2, 0.665 ±0.115g/cm^2, and 0.643 ±0.127 g/cm^2, in patients older than 80 years old, respectively. In patients younger than 60 years old, BMD of the femur neck, the total, and the Torch area in 30-40-year group was significantly higher than that in ≤30-year group (P≤0.05). In patients with the age of 70-80 years old, BMD of the total in ≥40-year group was significantly higher than that in ≤30-year group (P<0.001). In patients older than 80 years old, no significant difference of BMD of the lumbar vertebrae or the hip among 3 groups was observed. **Conclusion** The duration of menstrual cycle can affect BMD in postmenopausal women with a younger or middle age , but it has no effect on BMD in elder patients.

Key words: Duration of menstrual cycle; BMD; Postmenopausal women

绝经后骨质疏松症是多因素疾病。其中卵巢功能衰竭雌激素水平迅速下降是绝经后发生骨质疏松症的主要原因。引起绝经后骨质疏松的其他高危因素如初潮及绝经年龄、生育次数及哺乳时间等与骨质疏松的关系均有报道。而行经寿命对骨质疏松是否影响国内少有报道。现将我院的有关研究结果报道如下。

1 资料与方法

1.1 资料来源

2004 年 2 月至 2010 年 2 月,选择来华东医院骨松科就诊并进行骨密度(BMD)检测的绝经后妇女 4226 例。对其中无内分泌及影响骨代谢疾病的 2304 例(54.5%,2304 /4226)妇女的检测结果纳入分析;按每 10 岁一个年龄段进行分组,其中小于 60 岁组 794 例,60 ~ 69 岁组 684 例,70 ~ 79 岁组 617 例,大于 80 岁组 209。分别比较行经寿命小于等于 30 年、30 ~ 40 年、大于等于 40 年各组妇女腰椎、髋部骨密度。

1.2 方法

采用美国 Hologic 公司生产的 DelphiA 型双能 X 线骨密度仪(DXA)测定第 1 ~ 4 腰椎(L1 ~ 4)、股骨颈(FN)、全髋(Total)、大转子(Torch)及华氏三角区(Wards)BMD。

1.3 统计学方法

统计方法:用 SPSS13.0 统计软件,变量指标用平均数加减标准差来表示,两样本均数比较采方差分析;以 P < 0. 05 为差异有统计学意义。

2 结果

2.1 行经寿命小于等于 30 年、30 ~ 40 年、大于等于 40 年各组妇女腰椎骨密度(L1 ~ 4BMD):小于 60 岁组分别为(0.782 ± 0.127) g/cm^2、(0.857 ± 0.133) g/cm^2、(0.881 ± 0.120) g/cm^2;60 ~ 69 岁组(0.784 ± 0.130) g/cm^2、(0.788 ± 0.139) g/cm^2、(0.842 ± 0.130) g/cm^2;70 ~ 79 岁组(0.753 ± 0.144) g/cm^2、(0.773 ± 0.149) g/cm^2、(0.799 ± 0.167) g/cm^2;≥80 岁组(0.725 ± 0.096) g/cm^2、(0.825 ± 0.162) g/cm^2、(0.774 ± 0.150) g/cm^2。其中小于 60 岁组中行经寿命≥40 年组和 30 ~ 40 年组腰椎 BMD 明显高于行经寿命≤30 年组,差异有统计学意义(P≤0.001);60 ~ 69 岁组中行经寿命≥

40 年组腰椎 BMD 明显高于行经寿命 30 ~ 40 年组，差异有统计学意义（$P \leq 0.01$）。见表 1。

2.2 行经寿命小于等于 30 年、30 ~ 40 年、大于等于 40 年各组妇女髋部 BMD：股骨颈：小于 60 岁组（0.649 ± 0.093）g/cm^2、（0.688 ± 0.102）g/cm^2、（0.690 ± 0.087）g/cm^2；60 ~ 69 岁组（0.621 ± 0.114）g/cm^2、（0.625 ± 0.094）g/cm^2、（0.642 ± 0.096）g/cm^2；70 ~ 79 岁组（0.572 ± 0.102）g/cm^2、（0.570 ± 0.098）g/cm^2、（0.609 ± 0.088）g/cm^2；≥ 80 岁组（0.545 ± 0.078）g/cm^2、（0.565 ± 0.094）g/cm^2、（0.539 ± 0.099）g/cm^2。大转子：小于 60 岁组（0.557 ± 0.084）g/cm^2、（0.589 ± 0.104）g/cm^2、（0.601 ± 0.083）g/cm^2；60 ~ 69 岁组（0.535 ± 0.102）g/cm^2、（0.533 ± 0.960）g/cm^2、（0.562 ± 0.091）g/cm^2；70 ~ 79 岁组（0.472 ± 0.095）g/cm^2、（0.480 ± 0.094）g/cm^2、（0.551 ± 0.098）g/cm^2；≥ 80 岁组（0.458 ± 0.074）g/cm^2、（0.470 ± 0.096）g/cm^2、（0.452 ± 0.110）g/cm^2。全髋：小于 60 岁组（0.782 ± 0.108）g/cm^2、（0.821 ± 0.111）g/cm^2、（0.829 ± 0.102）g/cm^2；60 ~ 69 岁组（0.750 ± 0.114）g/cm^2、（0.752 ± 0.114）g/cm^2、（0.779 ± 0.113）g/cm^2；70 ~ 79 岁组（0.679 ± 0.119）g/cm^2、（0.686 ± 0.117）g/cm^2、（0.768 ± 0.102）g/cm^2；≥ 80 岁组（0.647 ± 0.080）g/cm^2、（0.665 ± 0.115）g/cm^2、（0.643 ± 0.127）g/cm^2。其中小于 60 岁组中行经寿命 30 ~ 40 年组股骨颈和全髋部位 BMD 明显高于行经寿命≤30 岁组，差异有统计学意义（$P < 0.05$）；70 ~ 79 岁组行经寿命≥40 年全髋和大转子部位 BMD 明显高于行经寿命≤30 年组和 30 ~ 40 年组，差异有统计学意义（$P < 0.001$）。≥80 岁组各组行经寿命在腰椎和髋部各部位 BMD 差异无统计学意义。见表 1。

表 1 各年龄组不同行经寿命 BMD 情况：（g/cm^2，$\bar{x} \pm s$）

Table 1 BMD of patients with different duration of menstrual cycle in different age group

年龄组（岁）	月经持续时间（年）	腰椎 1 ~ 4	股骨颈	大转子	全髋
	≤30	0.782 ± 0.127	0.649 ± 0.093	0.557 ± 0.084	0.782 ± 0.108
< 60	30 ~ 40	0.857 ± 0.133[b]	0.688 ± 0.102[d]	0.589 ± 0.104	0.821 ± 0.111[d]
	≥40	0.881 ± 0.120[a]	0.690 ± 0.087	0.601 ± 0.083	0.829 ± 0.102
	≤30	0.784 ± 0.130	0.621 ± 0.114	0.535 ± 0.102	0.750 ± 0.114
60 ~ 69	30 ~ 40	0.788 ± 0.139	0.625 ± 0.094	0.533 ± 0.960	0.752 ± 0.114
	≥40	0.842 ± 0.130[c]	0.642 ± 0.96	0.562 ± 0.091	0.779 ± 0.113
	≤30	0.753 ± 0.144	0.572 ± 0.102	0.472 ± 0.095	0.678 ± 0.119
70 ~ 79	30 ~ 40	0.773 ± 0.149	0.570 ± 0.098	0.480 ± 0.094	0.686 ± 0.117
	≥40	0.799 ± 0.167	0.609 ± 0.088	0.551 ± 0.098[f]	0.768 ± 0.102[f]
	≤30	0.725 ± 0.96	0.545 ± 0.078	0.458 ± 0.074	0.647 ± 0.080
≥80	30 ~ 40	0.825 ± 0.162	0.565 ± 0.094	0.470 ± 0.96	0.665 ± 0.115
	≥40	0.774 ± 0.150	0.539 ± 0. 099	0.452 ± 0.110	0.643 ± 0.127

注：[a] 与≤30 岁者比较，$P \leq 0.001$，[b] 与≤30 岁者比较，$P \leq 0.001$；[c] 与 30 ~ 40 岁者比较，$P \leq 0.01$；[d] 与≤30 岁者比较，$P \leq 0.05$；[f] 与≤30 岁、30 ~ 40 岁者比较 $P \leq 0.05$

3 讨论

国外学者 Hagemans 研究[1]：生育期年数可以解释 4.8% BMD 差异；老年妇女中生育期年数对骨密度的影响更强。行经寿命等于绝经年龄—初潮年龄。其实反应了卵巢功能维持情况。卵巢功能维持时间越长，也就等于雌激素、孕激素对骨组织作用持续时间越久，促进骨形成作用也越长。雌激素对骨组织作用机制目前认为通过直接调节机制、旁分泌机制、细胞凋亡机制来调节破骨细胞的骨吸收和成骨细胞的骨形成[2]。孕激素与骨代谢存在着密切的关系。孕激素可通过成骨细胞上的孕激素受体直接对成骨细胞发挥作用。细胞培养、动物实验和临床研究均表明孕激素能促进骨形成，增加或维持骨量；孕激素单用或与雌激素适当组合可防治绝经后骨质疏松[3]。然而雌激素孕激素不足影响妇女骨量。月经周期规律的女性 BMD 高于不规律的女性[4]。国外学者研究了雌激素、孕激素不足的年轻妇女，在腰椎、股骨颈、全髋各部位有 2 ~ 3% 下降[5]。进一步说明卵巢功能的维系是影响骨代谢平衡的直接原因。行经寿命影响了绝经妇女的骨密度、直接影响中老年妇女的生活质量。从而提示围绝经妇女激素治疗的重要性和必要性。

本文研究结果提示绝经后妇女、低龄老人、中龄老人腰椎、髋部各部位骨密度随着行经寿命延长而有增加趋势；高龄老人腰椎、髋部各部位骨密度未出

现随着行经寿命延长骨密度增加趋势。可能反应激素作用的差异在高龄妇女中已不能体现。而主要受其他因素影响。具体机制有待于进一步探讨。

【 参 考 文 献 】

[1] Hagemans ML, van der Schouw YT, de Kleijn MJ, et al. Indicators for the total duration of premenopausal endogenous estrogen exposure in relation to BMD. Hum Reprod, 2004, 19(9):2163-2169.

[2] Ma Qingfen. Progress in study on Mechanism of estrogen on osteopotosis. Foreign Medical Sciences (Obstet Gynecol Fascicle), 2005, 32(3):152-164.

[3] Liang Min, Liao Eryuan. Role of progesterone in postmenopausal Osteoporosis. Foreign Medical Sciences (Section of Endocrinology), 2003,23(2):136-138.

[4] Annemieke M Boot, Maria AJ de Ridder, Huibert AP Pols, et al. Bone mineral density in children and adolescents: Relation to puberty, calcium intake, and physical activity. J Clin Endocrinol Metab, 1997, 82(1): 57-62.

[5] Vaishali B. Popat, Karim A. Calis, Vien H. Bone Mineral Density in Estrogen-Deficient Young Women J Clin Endocrinol Metab, 2009, 94(7):2277 - 2283.

(收稿日期:2012-11-23)

(上接第 445 页)

[11] Omi N, Ezawa I. The effect of ovariectomy on bone metabolism in rats [J]. Bone, 1995, 17(4 Suppl): 163S-8S.

[12] Cao J, Venton L, Sakata T, et al. Expression of RANKL and OPG correlates with age-related bone loss in male C57BL/6 mice [J]. Journal of bone and mineral research : the official journal of the American Society for Bone and Mineral Research, 2003, 18(2): 270-7.

[13] Hsieh TP, Sheu SY, Sun JS, et al. Icariin isolated from Epimedium pubescens regulates osteoblasts anabolism through BMP-2, SMAD4, and Cbfa1 expression [J]. Phytomedicine : international journal of phytotherapy and phytopharmacology, 2010, 17(6): 414-23.

[14] Hsieh TP, Sheu SY, Sun JS, et al. Icariin inhibits osteoclast differentiation and bone resorption by suppression of MAPKs/NF-kappaB regulated HIF-1alpha and PGE(2) synthesis [J]. Phytomedicine: international journal of phytotherapy and phytopharmacology, 2011, 18(2-3): 176-85.

(收稿日期:2013-01-22)

(上接第 481 页)

[8] Pmitt LA. Weight 2 training effects on bone mineral density in early postm enopausal women[J]. J Bone Miner Res,1992,(7): 179-185.

[9] Duppe H. Bone mineral density in female junior, senior and form er football players[J]. Osteoporosis lnt,1996,(6):437-441.

[10] Liu ZH. The pathogenesis of osteoporosis. Beijing: Beijing Science Press. 1998:186-191.

[11] Tian Y. Advanced physiology of sports and exercise. Beijing: High Education Press. 2003:848.

[12] Duan TJ. Value and fuction of Zhuanggong. Henan University. 2008,23:135-138.

[13] Qiao FJ. Natural and supernatural-the Dao of wiliness and the Dao of morality of traditional Wush. Journal of Shandong institute of physical education and sport(Ⅱ), 2005,21(3):10-13.

[14] Xue Y. Biochemical diagnosis of osteoporosis. Chinese journal of osteoporosis, 1995,1(1):59-62.

[15] Yang DC, Wang HF. Osteoporosis guidelines. Chengdu: Chengdu Science & Technology Press. 1998.

[16] Li YY, Lin KK. Analysis of effects of exercise intervention on bone mineral density in elderly patients with osteoporosis and the clinical symptoms. Journal of nurses training, 2008, 23(10): 920-922.

[17] Qu YR. Effect of exercises on osteoporosis in psotmenopausal women. Chinese journal of osteoporosis, 1999,5(2):24-25.

[18] Burger EH, J Klein-Nulend, AVander Plas, et al. Function of osteocytes in bone-their role in mechanotransduction[J]. J Nutr, 1995,125:2020-2023.

(收稿日期:2012-10-12)

行经寿命对绝经后妇女骨密度的影响

作者： 李慧林， 朱汉民， 程群， 杜艳萍， 洪维， 朱晓颖， 张雪梅， 薛思红， LI Huilin， ZHU Hanmin， CHENG Qun， DU Yanping， HONG Wei， ZHU Xiaoyin， ZHANG Xuemei， XUE Sihong

作者单位： 华东医院,上海,200040

刊名： 中国骨质疏松杂志 ISTIC

英文刊名： CHINESE JOURNAL OF OSTEOPOROSIS

年，卷(期)： 2013,19(5)