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·临床研究·

中老年女性腰椎、髋部、前臂骨密度和骨质疏松检出率的对比分析

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摘要:**目的** 探讨中老年女性在应用双能 X 线骨密度仪检测不同部位骨密度时应关注检测的部位。**方法** 选取 2012 年 9 月至 2014 年 4 月在我院行双能骨密度检测的中老年女性,比较腰椎、髋部、前臂桡骨下 1/3 的骨密度(BMD)和 *T* 值。**结果** 中老年女性腰椎、髋部、前臂桡骨下 1/3 3 个部位的 BMD 和 *T* 评分比较,$P<0.001$ 有显著差异。随着年龄逐渐增大,腰椎、髋部和前臂 BMD 逐渐降低,但 70 岁以后腰椎 BMD 趋于平稳。腰椎 *T* 评分在 40 岁和 50 岁年龄段下降幅度较快,60 岁以后下降有所减缓,70 岁以后趋于平稳。髋部 *T* 评分在各年龄段呈匀速下降。前臂 *T* 评分随着年龄的增大下降幅度明显大于腰椎和髋部。骨质疏松检出率也随年增加而增加,重度骨质疏松检出率也以前臂为最高。**结论** 应用双能 X 线骨密度仪检测腰椎、髋部、前臂 3 个部位,经比较发现老年女性前臂骨密度和 *T* 评分明显低于腰椎和髋部,提示对老年女性骨质疏松诊断应同时检测前臂骨密度,以免出现骨质疏松的漏诊。

关键词:腰椎;髋部;前臂;骨密度;骨质疏松检出率

Comparative analysis of bone mineral density of the lumbar spine, hip, forearm and osteoporosis detection rate in middle-aged women

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Abstract: **Objective** To investigate the detection sites of bone mineral density (BMD) using dual-energy X-ray absorptiometry (DEXA) in the middle-aged women. **Methods** Middle-aged women who had BMD test using DEXA in our hospital from September 2012 to Apple 2014 were selected. BMD and T values of the lumbar spine, hip, and lower 1/3 of the forearm were compared. **Results** There were significant differences of BMD and T scores among 3 sites, the lumbar spine, hip, and lower 1/3 of the forearm, in middle-aged women ($P<0.001$). Along with the increase of age, BMD of the lumbar spine, hip, and forearm gradually decreased, but the BMD of the lumbar spine tended to be stable after 70 years of age. T-score of the lumbar spine declined rapidly at 40 – 50-year division, but the decline slowed after 60 years of age, and was stable after 70 years of age. T score of the hip declined evenly in all ages. Along with the increase of age, the decline of forearm T-score was significantly greater than that of the lumbar spine and the hip. The osteoporosis detection rate increased following aging. The detection rate of severe osteoporosis was the highest in the forearm. **Conclusion** BMD and T scores are significantly lower in the forearm, compared to those in the lumbar spine and the hip in middle-aged women, indicating that the forearm BMD should also be detected in middle-aged women to avoid misdiagnosis of osteoporosis.

Key words: Lumbar spine; Hip; Forearm; BMD; Osteoporosis detection rate

双能 X 线吸收仪(DXA)是目前诊断骨质疏松的“金标准”,是目前世界上被公认为 BMD 测定的首选方法,具有重复性好、辐射量低、测量方法简单等优点[1,2],同时也是评价抗骨质疏松药物疗效的主要手段[3]。国际临床骨密度学会(ISCD)于 2005 年 9 月制定的 2005 年版的骨密度共识文件规定[4]:双能 X 线骨密度检测部位是绝经后妇女和 50 岁以上的男性如果腰椎、整体髋或股骨颈的 *T* 值≤ -2.5SD 可以诊断为原发性骨质疏松症;在某些情况下桡骨 33%(或称下 1/3 桡骨)也可以作为诊断部

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位。由于各种原因,在临床工作中临床医师只选择腰椎和/或髋部检测,而忽视了对前臂的检测。本研究旨在通过对中老年女性腰椎、髋部及前臂 3 个部位的检测结果作对比分析,探讨双能 X 线骨密度检测的部位选择,为临床诊断原发性骨质疏松症(OP)提供依据。

1 材料和方法

1.1 对象

选取 2012 年 9 月至 2014 年 4 月在我院行双能骨密度检测的中老年女性,年龄 40 ~ 103 岁,检测腰椎、髋部、前臂桡骨下 1/3 3 个部位。

1.2 分组

按 10 岁 1 个年龄段分组,共有 5 组,分别为 40 ~ 49、50 ~ 59、60 ~ 69、70 ~ 79、> 80 岁。

1.3 诊断标准

骨质疏松症诊断标准:中国人群骨质疏松诊疗指南(2004 年)[5],参考世界卫生组织(WHO)标准,结合我国国情,以种族、性别、地区的峰值骨量(均值为 M)为依据:≥M-1SD 正常;M-1SD ~ -2SD 骨量减少;< M-2SD 骨质疏松症;< M-2SD 伴有一处或多处骨折,为严重骨质疏松症;< M-3SD 无骨折,也可诊断为严重骨质疏松症。

1.4 方法

采用法国 MEDI LINK 公司生产的 MEDI X90 双能 X 线骨密度检测仪,每天检测前进行仪器及腰椎骨模型质量控制,符合仪器精确度及准确度后开始检测。检测受检中老年女性腰椎(Total)正位(L_1-L_4)、髋部(Total)股骨颈(Neck),股骨粗隆(GT),转子间(InterTro)、前臂桡骨下 1/3 骨密度,系统自动计算出骨密度和 *T* 值均值。

1.5 统计学处理

数据用 SPSS 14.0 软件进行统计学处理分析,所得数值用均数 ± 校准差($\bar{x} \pm s$)表示,数据资料采用 LSD 比较。

2 结果

2.1 各年龄段 3 个部位 BMD 检测比较

各年龄段腰椎、髋部、前臂桡骨下 1/3 3 个部位的 BMD 比较 $P < 0.001$ 有显著差异。经过 LSD 两两比较发现腰椎 70 ~ 与 80 ~ 两组之间无统计学差异,其他各组间均有统计学差异;髋部和前臂各组之间均有统计学差异。从表 1 和图 1 可见,随着年龄逐渐增大,腰椎、髋部和前臂 BMD 逐渐降低,但 70 岁以后腰椎 BMD 趋于平稳。

表 1 腰椎、髋部、前臂各年龄段骨密度检测结果比较

Table 1 Comparison of BMD of the lumbar spine, hip, and forearm between each age division

部位	40 ~		50 ~		60 ~		70 ~		80 ~		*F*	*P*
	例数	BMD	例数	BMD	例数	BMD	例数	BMD	例数	BMD		
腰椎	1538	0.89 ± 0.12	2231	0.78 ± 0.13	2137	0.68 ± 0.11	1483	0.63 ± 0.12	459	0.63 ± 0.13	1180.508	< 0.001
髋部	1692	0.95 ± 0.12	2420	0.88 ± 0.13	2209	0.79 ± 0.12	1587	0.72 ± 0.12	422	0.66 ± 0.12	1056.61	< 0.001
前臂	337	0.48 ± 0.06	757	0.43 ± 0.07	841	0.36 ± 0.07	733	0.31 ± 0.07	234	0.28 ± 0.06	595.432	< 0.001

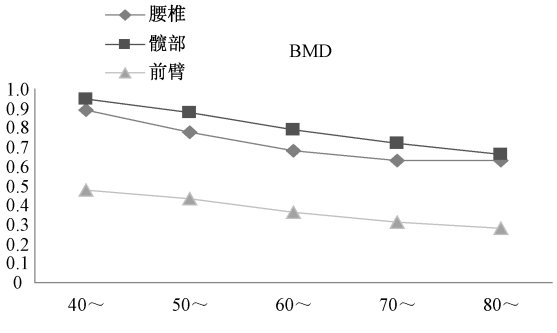

图 1 腰椎、髋部、前臂各年龄段骨密度趋势图

Fig. 1 Trends of BMD of the lumbar spine, hip, and forearm in each age division

2.2 各年龄段 3 个部位 *T* 评分比较

从表 1 和图 1 可见,腰椎 *T* 评分在 40 岁和 50 岁年龄段下降幅度较快,60 岁以后下降有所减缓,70 岁以后趋于平稳。髋部 *T* 评分在各年龄段呈匀速下降。前臂 *T* 评分随着年龄的增大,下降幅度也明显增加,与腰椎、髋部有明显的统计学差异($P < 0.001$)。年龄组间经 LSD 两两比较发现腰椎组 70 ~ 和 80 ~ 两组之间无统计学差异,其他各组间均有统计学差异;髋部和前臂各组之间均有统计学差异;部位间经 LSD 两两比较发现各年龄组中 3 个部位间均有统计学差异。

2.3 各年龄组腰椎、髋部、前臂骨质疏松检出率

各年龄组腰椎、髋部、前臂 OP 检出率随年龄增加而增加,50 岁以后 OP 患病率呈递增趋势[6],髋部 OP 的检出率最低,与腰椎、前臂比较有显著差异($P < 0.001$),前臂检出率最高,而腰椎 OP 和重度 OP

检出率在 60 岁以后趋于平稳。见表 2、3。

表 2 各年龄段腰椎、髋部与前臂 T 评分比较

Table 2 Comparison of T score of the lumbar spine, hip, and forearm between each age division

部位	40 ~	50 ~	60 ~	70 ~	80 ~	*F*	*P*
腰椎	−0.76 ± 1.1	−1.74 ± 1.2	−2.76 ± 1.09	−3.15 ± 1.11	−3.2 ± 1.28	1165.61	< 0.001
髋部	0.4 ± 0.94	−0.13 ± 0.98	−0.85 ± 0.94	−1.41 ± 0.94	−1.91 ± 0.96	1134.933	< 0.001
前臂	−0.17 ± 1.41	−1.42 ± 1.76	−3.11 ± 1.75	−4.39 ± 1.69	−5.07 ± 1.59	599.279	< 0.001
F	475.658	1084.281	1887.1	1776.609	495.79		
P	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001		

表 3 各年龄组腰椎、髋部、前臂骨质疏松检出率(%)比较

Table 3 Comparison of osteoporosis detection rate of the lumbar spine, hip, and forearm between each age division

年龄段	腰椎				髋部				前臂			
	例数	骨量减少	骨质疏松	重度骨质疏松	例数	骨量减少	骨质疏松	重度骨质疏松	例数	骨量减少	骨质疏松	重度骨质疏松
40 ~	1538	27.9	9.8	2.5	1692	5.6	0.4	0.0	337	16.9	6.2	3.0
50 ~	2231	27.1	28	16.5	2420	13.4	3.0	0.3	757	20.3	14.9	21.4
60 ~	2137	15.7	30.8	45.7	2209	29.7	10.4	1.2	841	8.8	18.9	57.2
70 ~	1483	10.1	22.8	61.6	1587	37.7	22.2	5.2	733	6.0	10.4	79.9
80 ~	459	8.9	22.4	61.7	422	33.2	35.8	14.7	234	3.0	3.4	91.5

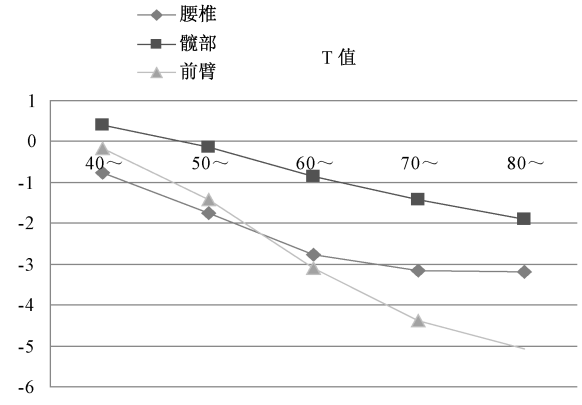

图 2 各年龄段腰椎、髋部、前臂 T 评分趋势图

Fig. 2 Trends of T score of the lumbar spine, hip, and forearm in each age division

3 讨论

随着人口老龄化的发展,骨质疏松症的患病率也呈逐年上升的趋势,在 1.43 亿的老龄人中约有 60% 的人群出现骨质疏松症[7]。目前广泛应用于 OP 诊断和临床骨折风险预测方法是对病人进行 BMD 检测,但是对哪个部位检测更有利于 OP 的诊断还有异议。刘忠厚等[8]认为,由于骨质疏松引起的骨折以腰椎压缩性骨折、股骨颈、桡骨远端为多,这些骨折给患者带来的痛苦及给社会造成的负担都是较大的,所以测量部位以上述 3 个部位为宜。由于老年人骨质增生、关节硬化、前后纵韧带钙化、椎体压缩性骨折及椎间盘钙化等因素影响,又由于人体各部位松质骨和密质骨含量不同,随着年龄的增加,各部位出现的骨量流失也会不同,所以不同年龄骨密度测量结果会在腰椎、髋部和前臂出现一定差异,若只测量腰椎和或髋部 BMD,而忽视对前臂的测量,会造成一部分 OP 患者漏诊。多篇报道显示,不同部位检测结果诊断 OP 患病率有很大差异性[9-11]。本组以腰椎、髋部和前臂 BMD 和 T 评分及 OP 检出率比较显示,3 者之间有显著差异性,老年女性腰椎 BMD 和 *T* 值比髋部低,前臂又比腰椎低,OP 检出也是前臂 > 腰椎 > 髋部。

对于中老年女性,特别是老年女性,需要结合多部位的 BMD 和 *T* 值评分来诊断 OP,而且前臂 BMD 的变化比腰椎和髋更为明显,且腰椎 BMD 测定可能受到老年人群椎体本身骨质增生和周围软组织异位钙化的影响,利用髋部和前臂评价 BMD 的状况似更有意义[12]。因此,腰椎、髋部和前臂多个部位测量结果相结合,可以大大提高 OP 检出率,为 OP 早期诊断、骨折风险评估及后期的干预治疗提供依据。

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患者的生存质量亟待提高,根据本研究发现腹膜透析患者骨质疏松的患病率较一般人群高,性别、年龄、透析龄、糖尿病是其危险因素,对高危患者进行早期相关检查如骨密度及骨活检,并早期干预,对改善慢性肾脏病患者的生存质量和延长生命尤为重要。

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