·流行病学·

大庆地区 1096 例汉族人群骨密度调查及骨质疏松发生率分析

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摘要: **目的** 调查大庆市 1096 例健康汉族人群骨密度,了解该地区健康人群骨量峰值、骨密度变化的规律及骨质疏松发生率。**方法** 采用美国 GE 公司生产的 Luner Prodigy Advance 型骨密度仪,检测受试者腰椎和股骨颈骨密度(BMD)。将 1096 例检测结果按不同性别每 5 岁为 1 年龄组,应用 SPSS19. 0 软件统计分析骨密度测量指标及骨质疏松(OP)发生率。**结果** 大庆市汉族男、女性人群腰椎骨密度峰值分别为 1. 197 ± 0. 203、1. 192 ± 0. 145,股骨颈骨密度峰值分别为 0. 977 ± 0. 157、0. 918 ± 0. 128。其峰值骨量年龄男性为 45 ~ 49 岁,50 岁以后开始缓慢下降。其峰值骨量年龄女性为 40 ~ 49 岁,50 岁以后开始缓慢下降。50 ~ 54 岁年龄段男性骨质疏松症发生率为 5. 56%,女性为 5. 67%;55 ~ 59 岁年龄段男性骨质疏松症发生率为 7. 32%,女性为 11. 51%;60 ~ 64 岁年龄段男性骨质疏松症发生率为 15. 15%,女性为 28. 28%;65 ~ 69 岁年龄段男性骨质疏松发生率为 26. 67%,女性为 29. 41%;70 ~ 74 岁年龄段男性骨质疏松发生率为 25. 00%,女性为 44. 44%;75 ~ 79 岁年龄段男性骨质疏松发生率为 36. 36%,女性为 77. 78%;80 岁以上男性骨质疏松发生率为 66. 67%,女性为 83. 33%。**结论** 大庆市汉族人群不同年龄及同年龄组两性之间比较骨密度测定值差异显著($P < 0. 01$)。55 岁以后各年龄段女性骨质疏松发生率明显高于男性($P < 0. 01$)。本研究报告的骨密度峰值大于沈阳地区,与合肥地区相近,略低于贵阳地区。OP 发生率与合肥地区比较相近,略低于沈阳地区。

关键词: 大庆地区;骨密度;骨峰值;骨质疏松;骨质疏松发生率

The investigation of bone mineral density on 1096 cases Han population in Daqing area and their incidence of osteoporosis

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Abstract: **Objective** The investigation of the BMD of 1096 people of Han nationality in Daqing was measured, to analyze peak bone mass and regularity of changes of bone mineral density and the incidence of osteoporosis. **Methods** BMD at the Lumbar Vertebrae and Femoral neck was measured using Lunar Prodigy Advance BMD detector made by American GE Healthcare Corporation in 1096 objects into different groups on the basis of each - 5year-old. The bone mineral density measurement indexes and osteoporosis (OP) incidence rate were analyzed using SPSS19. 0. **Results** The peak bone mineral density of lumbar spine in male and female was 1. 197 ± 0. 203、1. 192 ± 0. 145, and the peak bone mineral density of Femoral neck was 0. 977 ± 0. 157、0. 918 ± 0. 128. The peak bone mass age in men was 45 ~ 49 years old, after the age of 50 began a slow decline. The peak bone mass age in women is 40 ~ 49 years old, after the age of 50 began a slow decline. The incidence of osteoporosis was 5. 56% in male, and 5. 57% in female in the age group of 50 ~ 54; That was 7. 32% in male, and 11. 51% in female in 55 ~ 59; 15. 15% in male, and 28. 28% in female in 60 ~ 64; 26. 67% in male, and 29. 41% in female in 65 ~ 69; 25. 00% in male, and 44. 44% in female in 70 ~ 74; 36. 36% in male, and 77. 78% in female in 75 ~ 79; 66. 67% in male, and 83. 33% in female in over 80 years old. **Conclusion** There was significant difference in the BMD in different age groups and different sex with the same age groups of Han nationality in Dqing($P < 0. 01$). The incidence of osteoporosis in female is significantly higher than that in male after 55 years age ($P < 0. 01$). The peak bone mineral on this report was greater than

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Shenyang area, and colose to that in Hefei area, and below the Guiyang area. The incidence of osteoporosis are similar to Hefei area and slightly lower than the Shenyang area.

Key words: Daqing area; Bone mineral density; peak bone mineral density; Osteoporosis; incidence of osteoporosis (OP)

随着人口老龄化的到来,骨质疏松是一个世界范围内的、越来越引起人们重视的健康问题。骨质疏松症(OP)是一种以全身骨量减少、骨组织微结构改变,骨质脆性和骨折危险频度增加为特征的全身性骨骼疾病[1]。世界卫生组织将数字化双能 X 线骨密度检查定为骨质疏松诊断的金标准[2-4]。许多研究证明,遗传、营养、体力活动及环境因素不同,导致性别和年龄匹配的各种族人群之间,骨密度(BMD)存在种族及地域差异[5-8]。大庆市处于中国北部地区,北纬 46°,汉族人口聚集,享有"百湖之城"的美名。大庆地区冬季较长,气温寒冷,人群光照少、运动少;夏季较短,气温适宜,空气质量好,适宜运动。大庆的地理位置以及地域性生活习惯将对当地人群骨密度水平及骨质疏松症发生率产生影响。

1 材料和方法

1.1 检测对象

收集自 2008 年 1 月至 2010 年 12 月到大庆油田总医院体检中心及骨质疏松门诊检查骨密度的大庆市 25 ~ 84 岁汉族人群。分别来自油田公司职工、机关、学校、服务业及离退休人员。采集生活史、既往史、家族史、运动及特殊用药史、女性月经史及生育哺乳史。

1.2 检测方法

采用美国 GE 公司生产的 Luner Prodigy Advance 型骨密度仪,检测受试者腰椎和股骨颈骨密度(BMD),获得 BMD 均值。并将检测结果与不同作者报告同类型仪器检测的沈阳、合肥、贵阳地区同性别、同年龄人群检测结果相比较。

1.3 统计学处理

全部资料数据按性别、年龄分组输入计算机数据库。排除标准:①急慢性肝、肾疾病及内分泌疾病。②应用抗骨质疏松药物以及激素、利尿剂等药物史。③手术史。④制动 3 个月病史。将入组数据采用 SPSS19.0 软件分析处理,数据用 $\bar{x} \pm s$ 表示。

2 结果

经排除后,有 1096 例人群符合标准并将其 BMD 检测值入组分析。本研究报告的 1096 例 BMD 检测结果显示,大庆市汉族男、女性人群腰椎骨密度峰值分别为 1.197 ± 0.203、1.192 ± 0.145,股骨颈骨密度峰值分别为 0.977 ± 0.157、0.918 ± 0.128。其峰值骨量年龄男性为 45 ~ 49 岁,50 岁以后开始缓慢下降($P < 0.01$)。其峰值骨量年龄女性为 40 ~ 49 岁,50 岁以后开始缓慢下降($P < 0.01$)。大庆市汉族人群不同年龄及同年龄组两性之间比较骨密度测定值差异显著($P < 0.01$)。55 岁以后各年龄段女性骨质疏松发生率明显高于男性($P < 0.01$)。同年龄组两性之间比较,BMD 测定结果及 OP 发生率见下表。

表 1 大庆地区男性不同年龄段不同部位骨密度及 OP 发生率

Table 1 The bone mineral density and the OP incidence of men in Daqing area in different age groups and different parts ($\bar{x} \pm s$, g/cm^2)

Age (years)	n	L1	L2	L3	L4	L1-L4	Neck	The incidence of OP(%)
25 ~ 29	2	1.214 ± 0.021	1.319 ± 0.036	1.337 ± 0.024	1.306 ± 0.042	1.294 ± 0.000	1.004 ± 0.066	0
30 ~ 34	11	1.092 ± 0.076	1.188 ± 0.116	1.254 ± 0.127	1.234 ± 0.147	1.192 ± 0.109	1.011 ± 0.165	0
35 ~ 39	25	1.044 ± 0.132	1.168 ± 0.160	1.230 ± 0.147	1.210 ± 0.165	1.157 ± 0.143	0.955 ± 0.118	0
40 ~ 44	38	1.057 ± 0.176	1.278 ± 0.846	1.212 ± 0.217	1.193 ± 0.206	1.185 ± 0.315	0.976 ± 0.143	2.63
45 ~ 49	34	1.103 ± 0.193	1.196 ± 0.209	1.234 ± 0.218	1.238 ± 0.215	1.197 ± 0.203	0.977 ± 0.157	2.94
50 ~ 54	36	1.033 ± 0.139	1.128 ± 0.149	1.201 ± 0.150	1.188 ± 0.158	1.138 ± 0.142	0.901 ± 0.294	5.56
55 ~ 59	41	1.056 ± 0.167	1.161 ± 0.215	1.217 ± 0.208	1.198 ± 0.231	1.157 ± 0.199	0.925 ± 0.134	7.32
60 ~ 64	33	1.016 ± 0.154	1.095 ± 0.185	1.190 ± 0.223	1.153 ± 0.191	1.114 ± 0.169	0.906 ± 0.120	15.15
65 ~ 69	15	1.012 ± 0.206	1.090 ± 0.229	1.160 ± 0.252	1.154 ± 0.260	1.104 ± 0.228	0.846 ± 0.125	26.67
70 ~ 74	16	1.058 ± 0.173	1.074 ± 0.215	1.149 ± 0.204	1.208 ± 0.221	1.132 ± 0.198	0.846 ± 0.105	25.00
75 ~ 79	11	1.019 ± 0.265	1.125 ± 0.279	1.208 ± 0.258	1.267 ± 0.278	1.155 ± 0.265	0.818 ± 0.217	36.36
80 ~ 84	6	0.890 ± 0.316	0.997 ± 0.301	1.013 ± 0.252	1.026 ± 0.300	0.981 ± 0.287	0.723 ± 0.075	66.67

表 2 大庆地区女性不同年龄段不同部位骨密度及 OP 发生率

Table 2 The bone mineral density and the OP incidence of women in Daqing area in different age groups and different parts ($\bar{x} \pm s$, g/cm^2)

Age (years)	*n*	L1	L2	L3	L4	L1-L4	Neck	The incidence of OP(%)
25 ~ 29	3	1.024 ± 0.134	1.114 ± 0.115	1.190 ± 0.106	1.147 ± 0.134	1.119 ± 0.119	0.795 ± 0.125	0
30 ~ 34	16	1.094 ± 0.143	1.182 ± 0.167	1.225 ± 0.140	1.195 ± 0.152	1.174 ± 0.139	0.889 ± 0.132	0
35 ~ 39	54	1.088 ± 0.158	1.172 ± 0.176	1.251 ± 0.183	1.216 ± 0.189	1.182 ± 0.171	0.911 ± 0.114	1.85
40 ~ 44	77	1.095 ± 0.136	1.180 ± 0.158	1.263 ± 0.162	1.231 ± 0.163	1.192 ± 0.145	0.908 ± 0.128	1.30
45 ~ 49	118	1.072 ± 0.191	1.154 ± 0.168	1.240 ± 0.175	1.233 ± 0.183	1.173 ± 0.168	0.918 ± 0.126	1.69
50 ~ 54	141	0.997 ± 0.152	1.067 ± 0.175	1.154 ± 0.189	1.136 ± 0.179	1.088 ± 0.167	0.891 ± 0.132	5.67
55 ~ 59	139	0.905 ± 0.127	0.974 ± 0.144	1.053 ± 0.157	1.065 ± 0.173	1.000 ± 0.142	0.828 ± 0.107	11.51
60 ~ 64	99	0.859 ± 0.136	0.906 ± 0.171	0.996 ± 0.182	0.997 ± 0.191	0.940 ± 0.162	0.770 ± 0.115	28.28
65 ~ 69	85	0.855 ± 0.171	0.889 ± 0.156	0.975 ± 0.165	1.091 ± 0.982	0.950 ± 0.284	0.773 ± 0.112	29.41
70 ~ 74	72	0.821 ± 0.160	0.855 ± 0.183	0.895 ± 0.232	0.950 ± 0.224	0.880 ± 0.180	0.713 ± 0.125	44.44
75 ~ 79	18	0.714 ± 0.120	0.730 ± 0.113	0.830 ± 0.153	0.889 ± 0.201	0.791 ± 0.128	0.618 ± 0.079	77.78
80 ~ 84	6	0.749 ± 0.260	0.770 ± 0.249	0.826 ± 0.282	0.812 ± 0.276	0.789 ± 0.264	0.612 ± 0.087	83.33

3 讨论

3.1 BMD 峰值及骨量变化

BMD 峰值骨量影响人一生的骨矿物质含量,可作为评估人体骨量丢失出现的时间和骨量丢失程度的重要参考数据。骨量 60% ~90% 的变化与遗传因素相关;生活环境、体力运动、营养状况及年龄、性别因素也是影响骨量的重要因素[5-8]。本报告的 1096 例 BMD 调查结果显示大庆市汉族男、女性人群腰椎骨密度峰值分别为 1.197 ± 0.203、1.192 ± 0.145,股骨颈骨密度峰值分别为 0.977 ± 0.157、0.918 ± 0.128。大庆市汉族人群男性骨峰值发生在 45 ~49 岁年龄段,女性骨峰值发生在 40 ~49 岁年龄段,男性 BMD 峰值高于女性。将检查结果与应用同型号机器、同部位检查的沈阳、合肥、贵阳等地报导相比较,大庆地区汉族人群骨峰值大于沈阳地区,与合肥地区相近,略低于贵阳地区。骨峰值发生年龄较晚,均大于上述 3 个地区[9-11]。男性 25 ~29 岁组腰椎与股骨颈骨密度测量值为 1.294 ± 0.000、1.004 ± 0.066,高于骨密度峰值。男性 30 ~34 岁组股骨颈骨密度测量值为 1.011 ± 0.165,略高于骨峰值,其腰椎骨密度也高于 35 ~39 岁以及 40 ~44 岁年龄组。45 岁后男性组腰椎骨密度随年龄增长变化不均匀,股骨颈骨密度随年纪增长逐渐减少。女性组骨密度变化均匀,在 40 ~49 岁达到骨峰值后逐渐下降。骨密度呈上述表现,考虑以下几方面原因:①男性 25 ~29 岁组因入组人群为 2 人,无统计学意义。②男性 30 ~34 岁这个阶段运动还比较多,保持了很好的骨量。35 ~44 岁这个阶段忙于事业,忙于应酬,运动减少,饮酒增多,导致骨量流失明显[12-14]。45 岁以后开始注重锻炼,注意改善生活习惯,使骨量达到峰值。③男性体力劳动多,腰椎会有不同程度增生,影响 BMD 测定结果,也可能导致腰椎骨密度变化不均匀。而股骨颈影响因素相对较小,因此 50 岁后男性股骨颈骨密度变化随年龄增长而减低[15-17]。④由于地域区别,人们的生活习惯不同,水质不同等因素,使大庆地区骨峰值不同于上述 3 个地区,骨峰值年龄晚于上述 3 个地区[15-17]。

3.2 OP 发生率

根据 WHO 原发性 OP 诊断标准,腰椎或股骨颈骨密度低于 BMD 峰值 2.5 个标准差(SD)诊断为 OP[2-4]。本研究统计的 1096 例受试人群中,25 ~34 岁年龄段 OP 发生率为 0。男性 40 岁以后 OP 发生率呈递增趋势,65 岁后 OP 发生率显著增加,65 ~84 岁各年龄组间 OP 发生率差异显著($P < 0.01$)。女性 40 岁以后 OP 发生率呈递增趋势,60 岁后 OP 发生率显著增加,60 ~84 岁各年龄组间 OP 发生率差异显著($P < 0.01$)。女性各年龄组 OP 发生率明显高于男性($P < 0.01$)。大庆市各年龄组男性与女性 OP 发生率与合肥地区比较相近[10],略低于沈阳地区[9]。本研究提示同年龄、同性别的不同区域人群的 OP 发生率存在差异,但共同的是随着年纪的增长,OP 发生率增高。

通过对大庆市 1096 例汉族人群 BMD 调查,了解本地区 BMD 峰值以及 OP 发生率,并建立大庆地区汉族人群骨密度数据库,对大庆地区汉族人群 OP 早期诊断治疗和预防干预提供了依据。

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