



XA0054918

302-E4-BRA-8188

**STUDIES OF OSTEOPOROSIS IN URBAN RESIDENTS OF SÃO PAULO,  
BRAZIL, USING ISOTOPE RELATED TECHNIQUES.**

Part of Coordinated Program: **COMPARATIVE INTERNATIONAL STUDIES OF  
OSTEOPOROSIS USING ISOTOPE RELATED TECHNIQUES.**

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## INTRODUCTION

This project is aimed at defining the peak of bone mass in an urban population chosen randomly on account of the great miscigenation in São Paulo.

It is quite important to know the peak of bone mass and the factors that would interfere in the amount of bone formed as they are valuable guides for future plans of osteoporosis prevention.

In our previous meeting it was decided to increase the number of individuals studied from 210 to 350 and proceed with the evaluation of patient information according with the questionnaire proposed.

In this report it is presented the results on bone mineral density of lumbar L1-L4 and neck of femur in the total of 350 patients (175 women and 175 men) The complete data, as well as the information obtained from the questionnaire will be sent in the future reports as programmed in the meeting of São Paulo..

## **METHODS**

The individuals were chosen from normal relatives of patients who have come to the University Hospital for consultation, and Hospital workers and relatives. Subjects from 15 to 50 years old were distributed in 7 groups; each group with 25 individuals of each sex.

A questionnaire with some modifications from the originally proposed by the CRP to make it more applicable to our conditions of life and nutrition, was filled in the day the scan was performed covering details as milk ingestion, exercise, use of medicine which could interfere in the metabolism of bone, presence of bone deformities in members of the family and bone fractures.

Great variations from normal of milk ingestion or exercises were excluded. Secondary causes of osteoporosis were ruled out clinically or through laboratory tests when necessary.

## **LABORATORY METHODS**

Bone density was measured with a densitometer 4500 A (DEXA) from Hologic. A quality control for the spine was done everyday and for the hip every week. The variations of the standards were always within the accepted values.

## RESULTS

In Table 1-4 and Graphic 1-4 are presented the results of lumbar BMD ( $L_1-L_4$ ) and neck of femur from the total of 350 individuals as proposed. In this total it is included the results already presented in the prior meeting and added to the 140 remaining in the project to complete the total proposed.

The peaks of bone mass in this group of 350 brazilians from an urban area were the following-

- 1 - The peak of hip BMD in women is in the 26-30 year old group.
- 2 - The peak of  $L_1-L_4$  BMD in women is in the 36-40 year old group.
- 3 - The peak of hip BMD in men is the 26-30 year old group.
- 4 - The peak of  $L_1-L_4$  BMD in men is in the 31-35 year old group.

Table 1

HIP B.M.D. in women in different ages							
	16-20	21-25	26-30	31-35	36-40	41-45	46-50
<b>Patients</b>							
1	0.809	0.622	0.716	0.909	0.739	0.991	0.750
2	0.761	0.676	0.704	0.721	0.708	0.942	0.533
3	0.939	0.743	0.487	0.711	0.647	0.758	0.602
4	0.697	0.722	0.890	0.661	0.732	0.732	0.675
5	0.604	0.989	0.557	0.623	0.911	0.923	0.638
6	0.730	0.663	0.640	0.605	0.781	0.880	0.935
7	0.797	0.587	0.659	0.780	0.997	0.867	0.755
8	0.706	0.718	0.769	0.869	1.167	0.638	0.785
9	0.853	0.651	1.088	0.722	1.014	0.902	0.769
10	0.879	0.830	0.679	0.638	0.802	0.616	0.659
11	0.624	0.761	0.870	0.678	0.765	0.729	0.760
12	0.552	0.902	0.783	0.681	0.722	0.859	0.712
13	0.867	0.646	1.063	0.943	0.821	0.748	0.927
14	0.792	0.771	0.767	0.874	0.782	0.914	0.898
15	0.620	0.828	0.817	0.867	0.861	0.553	0.845
16	0.751	1.010	0.794	0.800	0.687	0.785	0.968
17	0.678	0.852	0.748	0.643	0.780	0.664	0.801
18	0.789	0.646	0.648	0.819	0.782	0.687	0.783
19	0.688	0.590	0.966	0.815	0.844	0.991	0.901
20	0.982	0.600	0.980	0.763	0.764	0.897	0.868
21	0.677	0.748	0.682	0.833	0.762	0.649	0.710
22	0.811	0.757	0.769	0.784	0.884	0.724	1.051
23	0.762	0.654	1.096	0.642	0.744	0.846	0.727
24	0.775	0.844	1.077	0.835	0.654	0.841	0.884
25	0.597	0.764	0.778	0.796	0.621	0.921	0.872
AVG	0.750	0.740	0.801	0.760	0.799	0.802	0.792
SD	0.108	0.117	0.167	0.097	0.123	0.124	0.123

Graphic 1

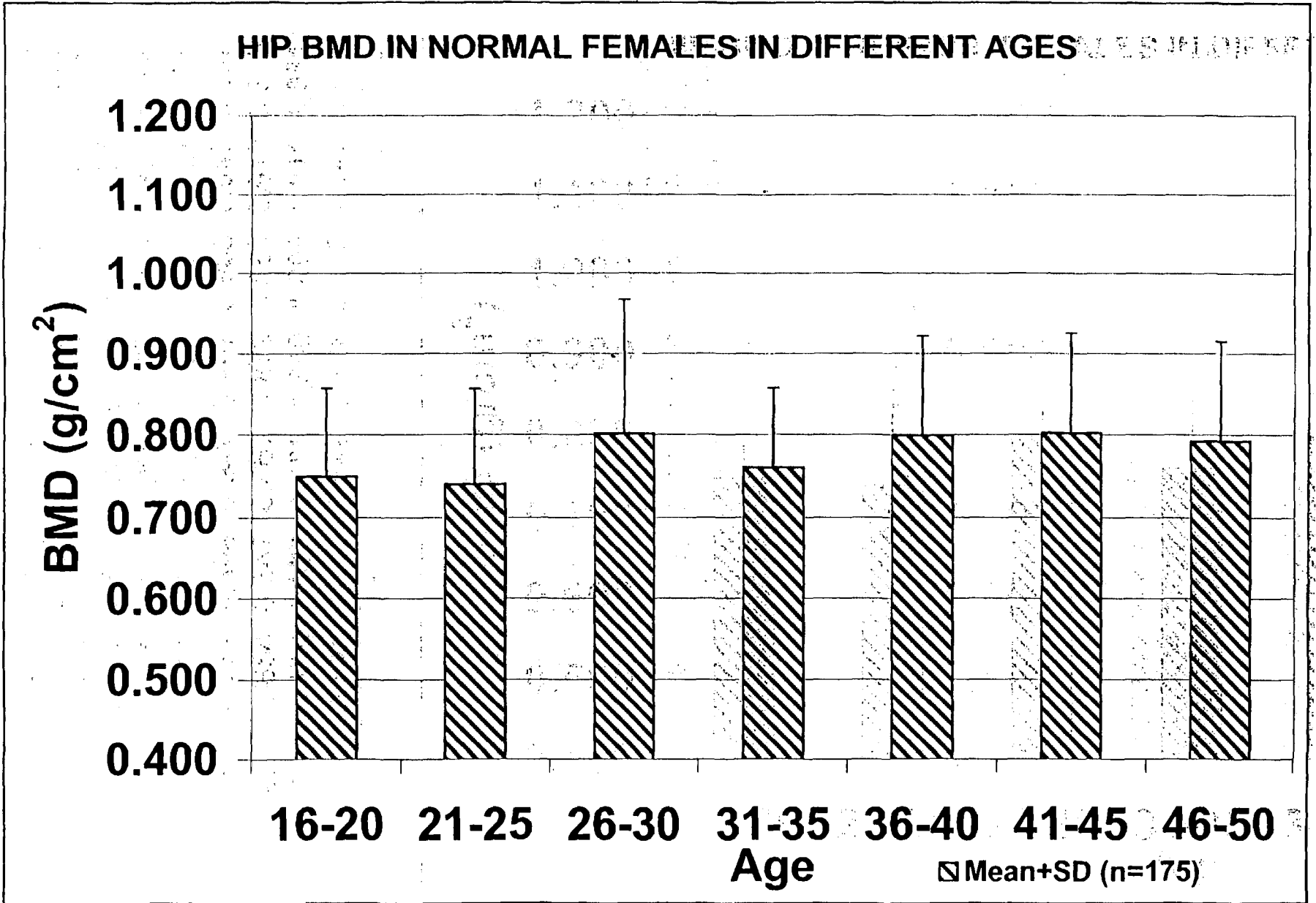
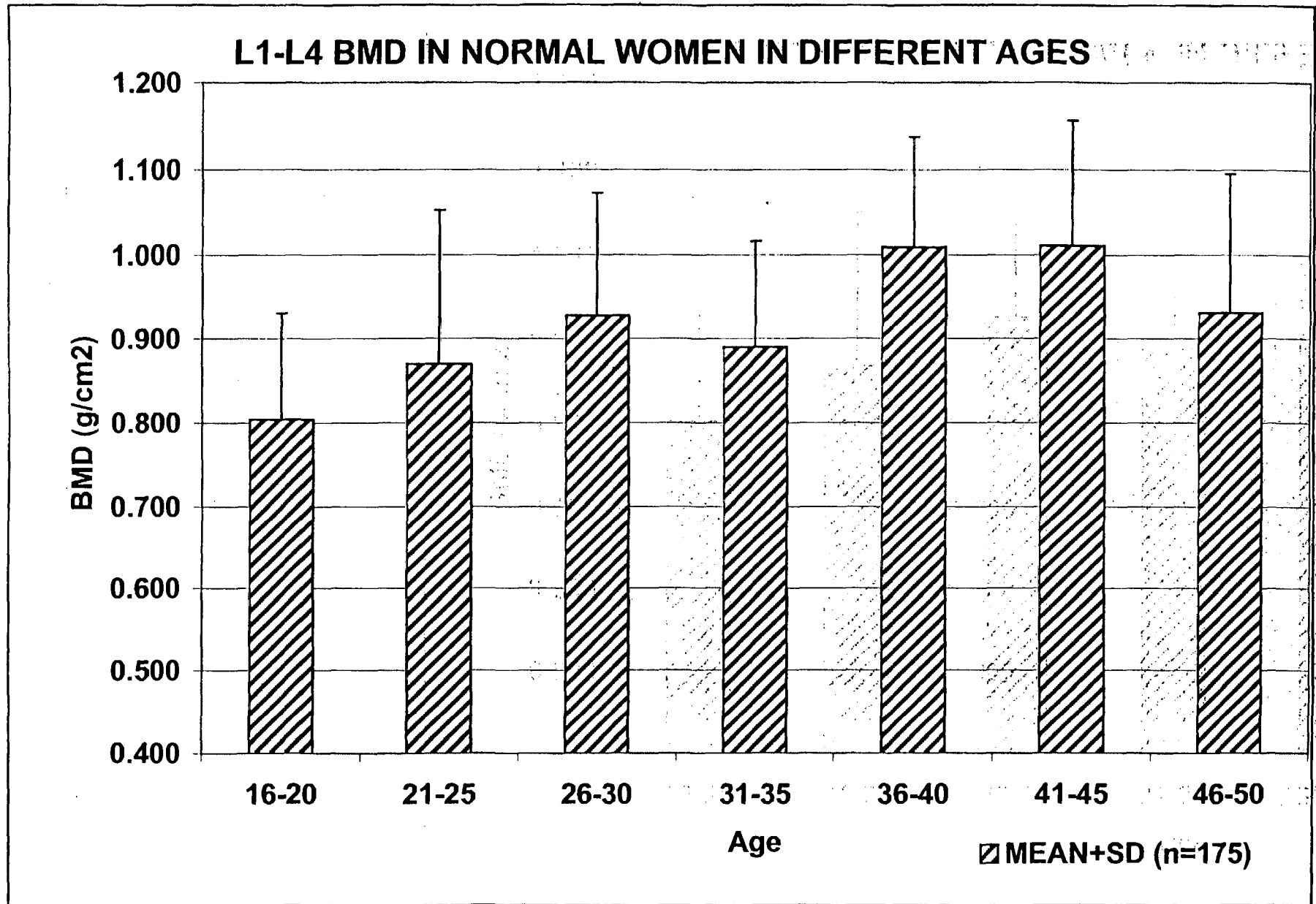


Table 2

L1-L4 B.M.D. in women in different ages							
	age						g/cm <sup>2</sup>
patient	16-20	21-25	26-30	31-35	36-40	41-45	46-50
1	0,850	0,946	1,024	1,005	1,149	1,238	0,890
2	0,977	0,826	0,937	0,887	0,792	0,909	0,533
3	0,687	0,806	0,865	0,848	0,847	0,947	0,918
4	0,811	1,283	1,000	0,821	1,051	0,844	0,850
5	0,900	0,716	0,931	0,885	1,094	0,872	0,695
6	1,023	0,916	1,158	1,096	0,995	1,039	0,662
7	0,871	0,786	0,814	0,801	1,133	1,190	1,350
8	0,914	0,744	1,069	0,802	1,268	0,943	0,917
9	0,762	0,812	0,892	0,850	1,035	0,790	0,945
10	0,762	0,998	1,004	0,900	1,077	0,839	0,927
11	0,717	1,198	1,065	0,827	1,090	0,935	0,882
12	0,513	0,930	0,817	0,861	0,943	1,089	0,942
13	0,963	1,124	1,001	1,076	0,950	1,212	1,104
14	0,987	1,016	0,776	1,127	1,037	0,947	1,011
15	0,837	1,102	1,111	0,896	1,292	1,196	1,076
16	0,644	0,949	0,948	0,886	0,800	1,244	0,938
17	0,879	0,570	0,520	1,010	0,942	1,212	1,035
18	0,778	0,868	0,993	0,908	1,017	0,968	1,086
19	0,688	0,790	0,595	0,989	0,999	0,922	1,016
20	0,851	0,814	0,986	0,879	0,978	0,987	0,838
21	0,897	0,883	1,002	0,546	0,878	0,997	1,073
22	0,678	0,782	0,993	0,783	1,079	0,873	1,056
23	0,678	0,644	0,881	0,684	1,033	1,221	0,765
24	0,779	0,698	0,947	0,997	0,886	0,947	0,897
25	0,654	0,547	0,867	0,879	0,864	0,912	0,876
<b>AVG</b>	<b>0,804</b>	<b>0,870</b>	<b>0,928</b>	<b>0,890</b>	<b>1,009</b>	<b>1,011</b>	<b>0,931</b>
<b>SD</b>	<b>0,127</b>	<b>0,183</b>	<b>0,145</b>	<b>0,126</b>	<b>0,128</b>	<b>0,145</b>	<b>0,164</b>

Graphic 2



53

1-8



Table 3

		LI-L4 IN NORMAL MEN IN DIFFERENT AGES							
		ages							
		16-20	21-25	26-30	31-35	36-40	41-45	46-50	
Patients		0.959	0.742	0.931	0.735	0.936	1.154	0.960	
		0.779	0.979	1.099	1.062	1.250	0.933	0.556	
		0.571	0.511	1.119	0.779	1.104	1.090	0.556	
		0.593	0.397	0.906	0.974	0.683	1.216	0.787	
		0.863	0.988	0.756	0.809	1.090	1.129	1.224	
		0.927	0.969	0.631	1.219	1.216	1.069	0.806	
		0.846	0.761	0.730	1.121	1.129	1.051	0.802	
		0.874	0.890	0.515	0.879	0.984	0.947	0.845	
		0.905	0.911	0.791	0.965	0.649	0.752	0.979	
		0.919	0.864	0.630	0.933	0.676	0.783	0.718	
		0.735	0.810	0.791	0.849	0.946	0.790	0.915	
		0.910	0.596	0.630	0.933	0.942	0.856	0.921	
		1.128	1.115	1.032	1.084	0.953	0.814	2.605	
		1.096	1.074	1.010	1.098	0.728	0.920	0.984	
		0.804	0.908	0.541	0.760	0.864	0.876	1.041	
		0.922	0.919	0.678	1.081	0.918	0.848	1.034	
		0.533	0.968	1.137	1.085	0.809	0.726	1.150	
		0.631	0.889	0.842	0.856	1.267	0.745	0.996	
		0.533	0.778	0.907	0.792	1.307	0.968	0.928	
		0.631	0.944	0.849	0.942	0.650	1.042	0.726	
		0.584	0.648	1.196	0.876	0.361	1.238	0.959	
		0.752	0.874	1.052	0.964	0.997	1.069	0.827	
		1.085	0.774	1.179	0.989	0.979	0.817	0.828	
		1.100	0.456	1.200	0.997	0.997	0.771	0.984	
		0.784	0.642	1.006	1.022	0.886	0.812	0.928	
		0.689	0.771	0.784	1.87	0.871	0.902	0.789	
	AVG		0.813	0.815	0.882	0.972	0.930	0.935	0.956
	SD		0.182	0.183	0.209	0.219	0.221	0.153	0.370

Graphic 3

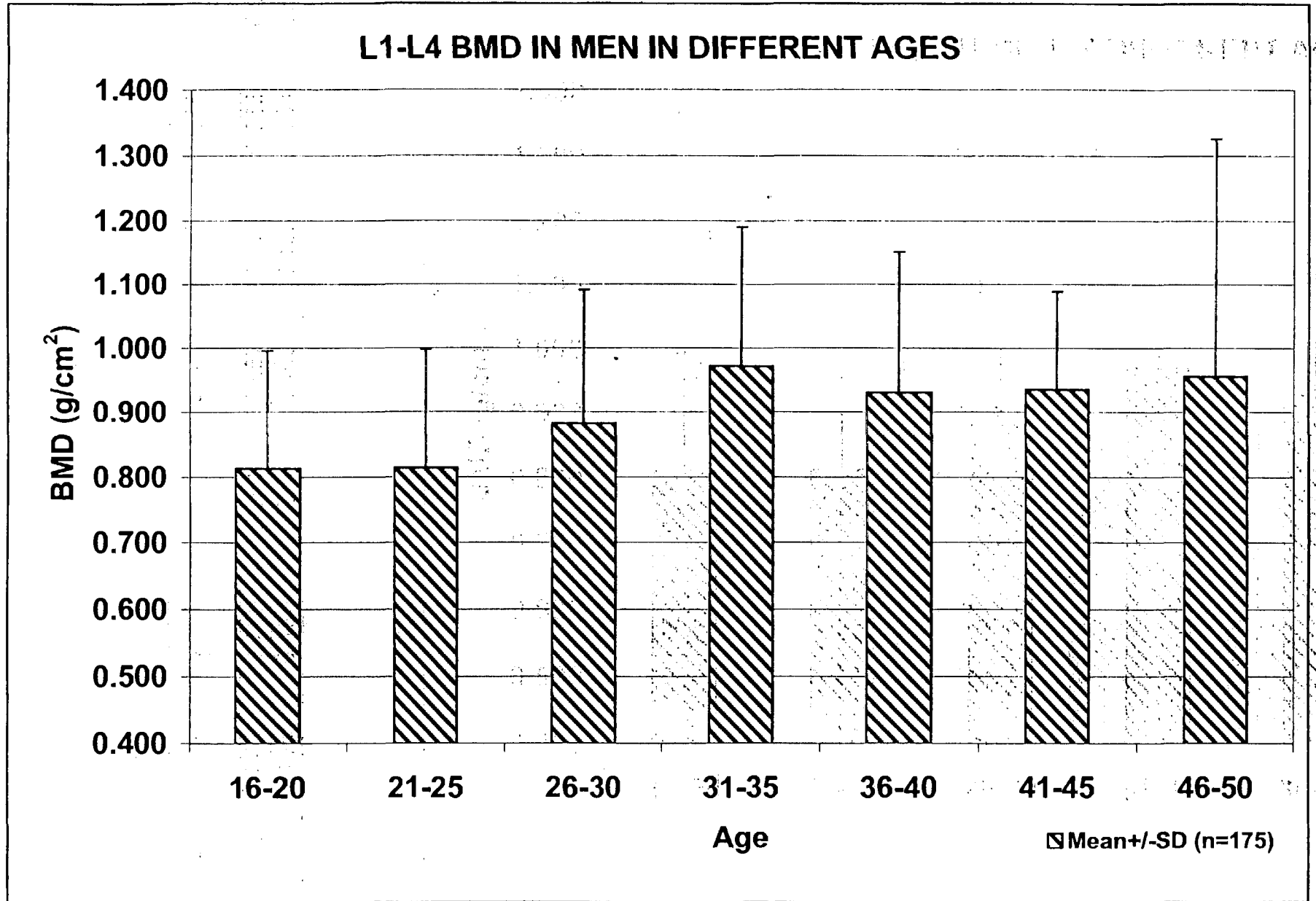
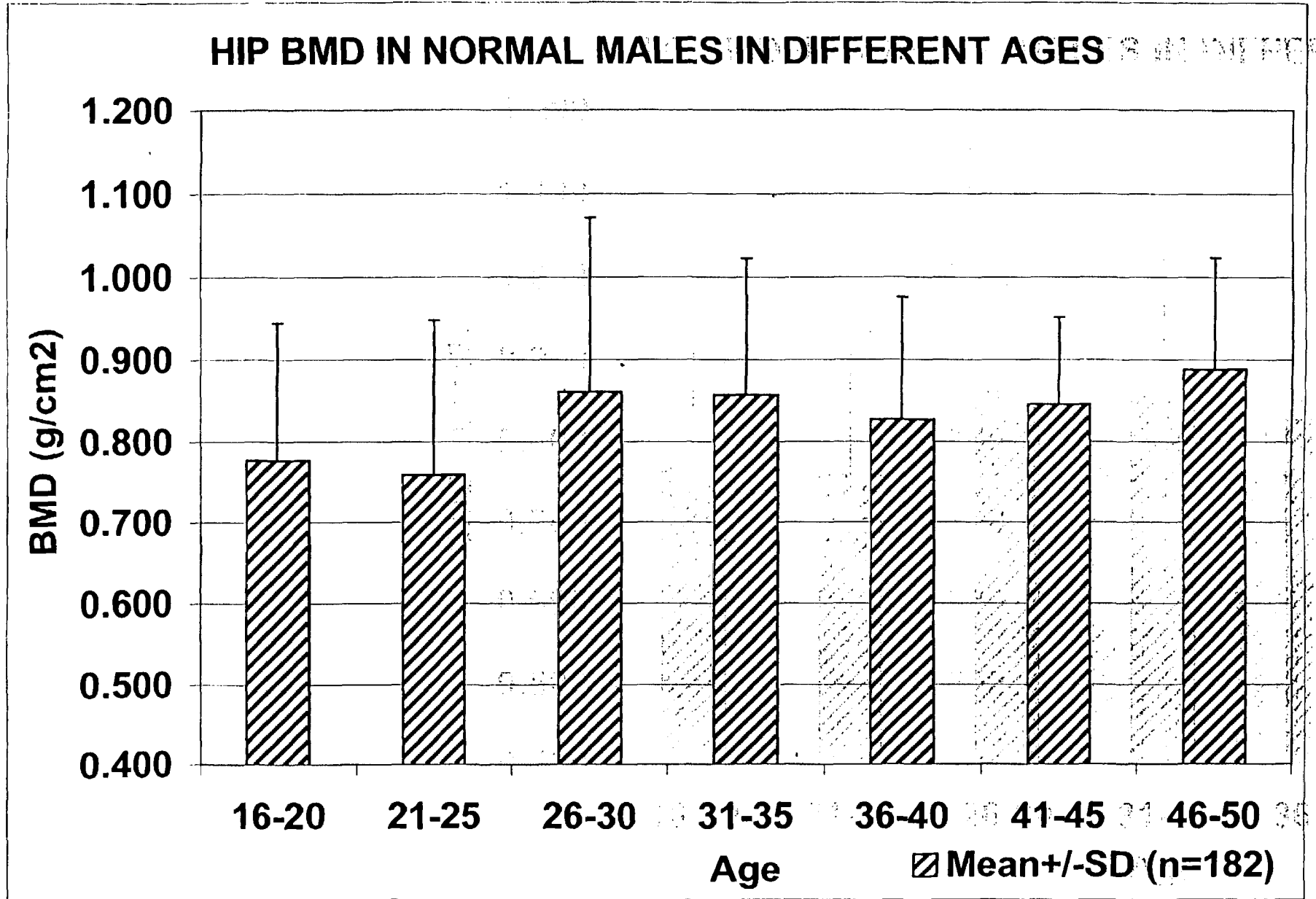


Table 4

HIP BMD IN MEN IN DIFFERENT AGES							
1988							
PATIENTS	AGE						
	16-20	21-25	26-30	31-35	36-40	41-45	46-50
1	1.097	0.779	0.715	0.646	0.777	0.712	0.863
2	0.947	0.359	0.745	0.842	0.885	0.925	0.945
3	0.821	0.280	0.673	0.830	0.887	1.005	0.761
4	1.005	0.968	0.705	1.155	0.710	0.821	0.734
5	0.936	1.006	0.754	1.174	0.705	0.629	0.839
6	1.035	0.750	0.542	0.723	0.948	0.631	0.811
7	0.851	0.780	0.439	0.679	0.942	0.832	0.927
8	0.535	0.786	0.985	0.970	0.733	0.921	1.209
9	0.716	0.983	1.036	0.670	0.943	0.865	0.861
10	0.632	0.755	0.666	1.171	0.879	0.684	0.891
11	0.759	0.496	0.546	0.901	0.805	0.654	0.894
12	0.706	0.765	0.896	0.747	0.721	0.725	0.723
13	0.739	0.752	0.874	0.824	0.774	0.681	0.867
14	0.828	0.918	0.931	0.936	0.937	1.046	1.030
15	0.796	0.862	1.118	0.827	0.631	0.768	1.098
16	0.644	0.862	0.797	0.631	0.998	0.568	1.248
17	0.705	0.557	0.743	0.998	0.732	0.722	1.178
18	0.690	0.690	1.281	0.697	0.795	0.392	0.594
19	0.651	0.514	1.155	1.102	0.803	0.688	0.782
20	0.764	0.730	1.197	0.898	0.756	0.697	0.957
21	0.853	0.789	0.993	0.842	0.592	0.871	0.964
22	0.579	0.903	0.894	0.993	0.957	0.905	0.919
23	0.700	0.746	0.771	0.805	0.855	0.697	0.700
24	0.538	0.729	0.921	0.668	0.591	0.905	0.984
25	0.550	0.993	0.931	0.772	0.575	0.803	0.778
26	1.131	0.988	1.071	0.781	1.288	0.811	0.884
AVG.	0.777	0.759	0.861	0.857	0.816	0.768	0.902
SD	0.168	0.190	0.211	0.165	0.155	0.144	0.158

Graphic 4



## **PLANS FOR THE FUTURE**

1. Prepare the complete data to be submitted according the spread sheet presented in the São Paulo meeting.
2. Measure the length of the neck of the femur (we have not yet received the necessary software).
3. Analyze and prepare the data from the questionnaire.
4. 4. After approval of the project by the Comission of Ethics of the University Hospital we will proceed with the collection of bone samples from the autopsy room and the neutron analysis as was presented in our first report.