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Age-related blood changes in hip osteoarthritis patients: a possible indicator of bone quality

SIR, In the thesis of one of us,¹ in which a large number of cases were studied, it was reported that blood level values for albumin, calcium, and 25-hydroxycholecalciferol (25-HCC) in aged subjects seem to diverge from the norm in cases of femoral neck fractures (FNF) and in cases of hip osteoarthritis (HOA); values (except for 25-HCC) were lower than normal for FNF and above normal for HOA (Table 1). When 25-HCC values were low, they did not necessarily correspond to the few patients with some histological signs of osteomalacia. To verify these observations we have repeated these studies on 89 new cases using, in addition, blood samples from 49 blood donors. These results were presented at the XVth International Congress of Rheumatology.

As in the preliminary study, we excluded patients with renal, hepatic, gastrointestinal and endocrine disorders, malignant tumours, or any treatment known to affect calcium-phosphorous metabolism. As in the preliminary study, protein values were determined by the methods of biuret and cellulose acetate electrophoresis (Mr C. Rosenbusch, Clinical Chemistry Laboratory, University Hospital, Geneva). In the previous study 25-HCC was determined by the method of Bouillon (Mrs C. Gasser, CEMO Laboratory, Geneva), while in the present study it was determined in a selected group of subjects by Mallon's method (Mrs U. Hennes, Hoffmann-La Roche, Basle).

The results confirmed those of the preliminary study. We found that for the HOA group the values obtained for albumin/globulin ratio and β -globulins were higher and evolved differently with age than those for the other 2

groups of aged subjects. This is illustrated for albumin in Fig. 1 and for 25-HCC in Fig. 2.

Figs. 1 and 2 Present study (albumin—25-HCC). Age-related slopes (computed regression lines). In brackets, number of cases.

Table 1 Preliminary study (albumin—calcium—25-HCC). Mean values $\pm$ SD. n = Number of cases. Significant differences are indicated

	A	B	C	D	(t test)
	Hip OA	Aged subjects	Fem. neck fractures	Blood donors	Statistical significance
Age (years)	76.62 $\pm$ 8.05	78.64 $\pm$ 6.08	79.74 $\pm$ 10.97	40.54 $\pm$ 11.38	A-B: p<0.05 A-C: p<0.005 A-D, B-C, C-D: p<0.0005
Albumin (g/l)	36.36 $\pm$ 3.89 (n = 18)	33.84 $\pm$ 4.23 (n = 22)	31.90 $\pm$ 4.08 (n = 36)	—	A-B: p<0.05 A-C: p<0.0005 B-C: p<0.05
Ca (mg/l)	98.10 $\pm$ 4.95 (n = 21)	95.10 $\pm$ 4.12 (n = 22)	92.93 $\pm$ 6.73 (n = 44)	—	A-B: p<0.025 A-C: p<0.0025
25-HCC (ng/ml)	13.40 $\pm$ 7.75 (n = 21)	9.14 $\pm$ 3.82 (n = 22)	9.28 $\pm$ 5.28 (n = 44)	20.52 $\pm$ 5.86 (n = 50)	A-B: p<0.05 A-C: p<0.01 A-D, B-D, C-D: p<0.0005

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These findings should be considered along with the observations which indicate that the bone density is greater in patients with hip osteoarthritis.²⁻⁴ This modification of the bone could, along with cartilage alteration, play a role in the pathogenesis of the disease.⁵ Indeed 25-HCC is involved in calcium-phosphorous metabolism and the serum albumin (to which the nondiffusible calcium is bound), may be incorporated into the bone matrix during bone turnover.⁶ These age-related blood changes of albumin and 25-HCC—2 substances whose metabolism is related to liver function—thus demonstrate a biological evolution in ageing which seems to reflect the condition of the skeleton with an atrophic variant (FNF) and an inverse variant (HOA).

We are continuing our research in order to complete the statistical analysis of all our results and to determine the possible variations in the different types of hip osteoarthritis as well as other forms of osteoarthritis.

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Fifth Latin Congress of Rheumatology

The 5th Latin Congress of Rheumatology will be held in Florence on 4-7 October 1982 at the Palazzo dei Congressi. The themes will be osteoarthropathies in the elderly; psoriatic arthropathy; prognosis of rheumatic diseases; chronic pain in rheumatic patients; immune-complex pathology; and inflammation of the synovial membrane. Details from the Secretariat, Centro Italiano Congressi, Via L. Spallanzani 11, 00161 Rome, Italy.