A study of some biochemical changes as an index of bone turnover in rheumatoid arthritis

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The aim of this work is .to study bone turnover occurring inn rheumatoid arthritis patients using estimation of some biochemicalchanges as an index of this bone turnover. Alkaline phosphataseand its isoenzymes especially alkaline phosphatase bone isoenzymewas estimated as an index of bone formation while the fastingurinary calcium creatinine ratio as an index of resorption. Alsothe levels of serum calcium and phosphorus were estimated to findout any change which may associate bone turnover in rheumatoidarthritis. This study aimed at finding out the relation between boneturnover and drug therapy, duration of the disease and parametersof the disease activity.Forty female patients suffering from rheumatoid arthritiscomprised the material of this work. The patients were allocatedinto two groups according to their drug therapy. the f{rst .groupcomprised 20 patients receiving non steroidal anti-inflammatorydrugs while the second group comprised 20 patients receiving steroidtherapy.Twenty healthy females-free from any relevant disease andmatched with the patients for age-included as a control group.All patients were examined clinically while laboratory investigationsand x-ray examination were done in order to confirm thediagnosis.Serum calcium, phosphorus, alkaline phosphatase and its isoenzymes(bone and liver fraction) were determined in the serumof the patients in each group and compared with those obtainedfrom the control.Fasting urinary calcium I creatinine ratio was estimated ineach group and compared with that obtained from 20 female controlsand also with each other.In this study, the correlations of alkaline phosphatase isoenzymesand fasting urinary calcium creatinine ratio versus parametersof disease activity and duration of the disease were donein each group.The results of our study demonstrated that, the mean .calciumlevels in the serum from patients with rheumatoid arthritis was(10.588 :!: 0.38 mg/100 ml) in the first group while in the secondgroup (10.305 :!: 0.42 1’!’g/100 ml), It was significantly higher. than that of the controls (9.1 :!: 0.33 mg/IOO ml) but betweenthe first and the second groups there was non significantdifference.The mean serum phosphorus levels of the patients (firstgroup 3.750 :!:0.15 mg/IOO ml) and second group 3.958 :!: 0.092mg/IOO ml) was insignificantly different from that of thecontrols (3.849 :!: 0.11 mg/IOO ml), Also these was non significantdifference between both groups.The mean level of alkaline phosphatase in the serum of thefirst and the second groups of the patients (17. 732:!:1.53 K.A. U./100 ml and 16.961 :!: 1.07 K.A.U. / 100 ml)was significantlyhigher than its mean level in the serum of the controls

(10.085:!: 0.7 K.A.U.). In the first group, it was higher than the ’secondgroups but with insignificant difference.The mean level of alkaline phosphatase bone isoenzyme inthe serum of rheumatoid arthritis patients were in the first group(1.67 :!: 0.332 K.A.U./ 100 ml) and second group (0.999 :!: 0.22K.A.t1. / 100 ml) while in the controls, it was 0.574:!: 0.122K.A.U. /100 ml. This increase was highly significant greater inthe first group than that in the control while in the secondgroup it was insignificantly greater’ than controls and in thefirst group it was higher than second group with insignificantdifference.The mean level of alkaline phosphatase liver isoenzymes inthe first group (15.659 ~ 1.33 K.A.U./100 ml and in the secondgroup (15.962 ~ 0.985 K.A.U./100 ml) were highly significantlygreater than controls (9.510 :1:0.729 K.A.U./lOO ml), A nonsignificunt difference WIIS found between the first and secondgroup.The mean value’ of fasting urinary calcium / creatinine ratioin the second group (0.212 ~ 0.008) was highly significantly greaterthan the controls (0.137 ~ 0.006) and also it was significantlygreater than the first group (0.181) which, in turn,was highly significantly greater than controls.A non significant correlation was found between the alkalinephosphatase or its isoenzymes especially bone fraction (index ofbone formation) and .parameters of disease activity or duration ofthe disease.A highly significant correlation was found between’ fastingurinary calcium/creatinine ratio (index of bone resorption) andduration of the disease while there was 110nsignificant correlationbetween this index and parameters of disease activity.from the previous study we come to the conclusion that boneturnover increased ill the patients with rheumatoid arthritis thanthe controls as noticed from increased indices of both bone formation(alkaline phosphatase bone isoenzyme) and bone resorption(fasting urinary calcium: creatinine ratio).Bone resorption was predominant especially in the grouptreated with corticosteroids.There was insignificant correlation between indices of boneturnover and activity of the disease while there was significantcorrelation between the index of bone resorption and duration ofthe disease which may be due to prolonged impairment of physicalactivity present in the patients with rheumatoid arthritis.Serum calcium level was significantly higher in the serum ofthe patients with rheumatoid arthritis than in the serum of thecontrols but this increase in the calcium level in the serum of thepatient was still within the normal range while· non significantdifference between phosphorus serum level in the patients andcontrols was found.