

Research Article

Impact of Obesity on Activity and Severity Parameters of both Rheumatoid Arthritis and Osteoarthritis

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Abstract

Background: Obesity is characterized by increased plasma leptin concentrations. Samad et al., (1999), found that the elevated plasma leptin concentrations in morbidly obese patients may enhance constitutive immunological stimuli, leading to increased concentrations of acute phase proteins and other inflammatory markers, characteristic for a chronic inflammatory state. The paradigm that obesity predisposes people to OA because of extra-mechanical loading only has shifted to the paradigm that metabolic factors (adipokines) are also involved in the pathophysiology of OA and hand joints are an ideal target to investigate the role of adipokines since they are not weight-bearing joints (Cicuttini F et al., 1996, Massengale M et al., 2012). **Objective:** To assess the impact of obesity and its parameters on both OA and RA as regard inflammatory markers (h.s CRP & serum leptin), disease activity and severity parameters. **Methods:** The study included 84 patients who were classified into three groups: group I; included 36 patients (43%) with OA which further subdivided in to two subgroups obese and non obese OA patients & group II; included 36 patients (43%) with RA and subdivided in to two subgroups obese and non obese RA patients & group III; included 12 (14%) of healthy non obese individuals as control group. **Results:** The OA group in the present study showed a high significant difference between obese and non obese patients as regard clinical manifestation; knee tenderness, inactivity stiffness, hand joints pain, DIP tenderness and DIP nodules. Laboratory finding of the OA group showed a significance differences between obese and non obese patients in serum TAG, serum CHOL, serum leptin, and CRP with no significance to ESR. The RA group showed significant differences in activity indices as HAQ index, DAS 28, VAS of pain and AI between the two subgroups. Inflammatory markers as ESR 1st hr, CRP and RF were significantly higher in obese group. **Conclusion:** Obesity has not only mechanical effect but also has metabolic effect on the different joints of OA patients and systemic inflammatory process in RA patients. Moreover obesity and elevated serum leptin have a significant effect on clinical symptoms, activity and severity of knee OA patients and on activity only not severity of hand OA patients.

Key Words: Obesity, Parameters, Rheumatoid

Introduction

Obesity is a medical condition in which excess body fat has accumulated to the extent that it may have an adverse effect on health, leading to reduced life expectancy and increased health problems. (Haslam D and James W, 2005).

It is unclear exactly how excess weight influences OA. Clearly, being overweight increases the load placed on the joints such as the knee, which increases stress and could possibly hasten the breakdown of

cartilage (Felson D, 1990 & Creamer, and Hochberg, 1997). Hand joints are an ideal target to investigate the role of adipokines since they are not weight-bearing, bringing into question a metabolic, rather than a mechanical, explanation for the association between obesity and OA (Massengale M et al., 2012).

Eric Matteson., (2012), at the Mayo Clinic found that obese individuals were 20 percent more likely to develop RA than people of normal weight.

Results

Clinical manifestations in OA subgroups:

There was a statistically higher expression of the clinical manifestations in obese subgroup when compared to non obese one in terms of knee tenderness ($p=0.001$), inactivity stiffness ($p=0.01$), hand joints pain ($p=0.001$), DIP joints tenderness ($p=0.01$) and DIP nodules ($p=0.01$).

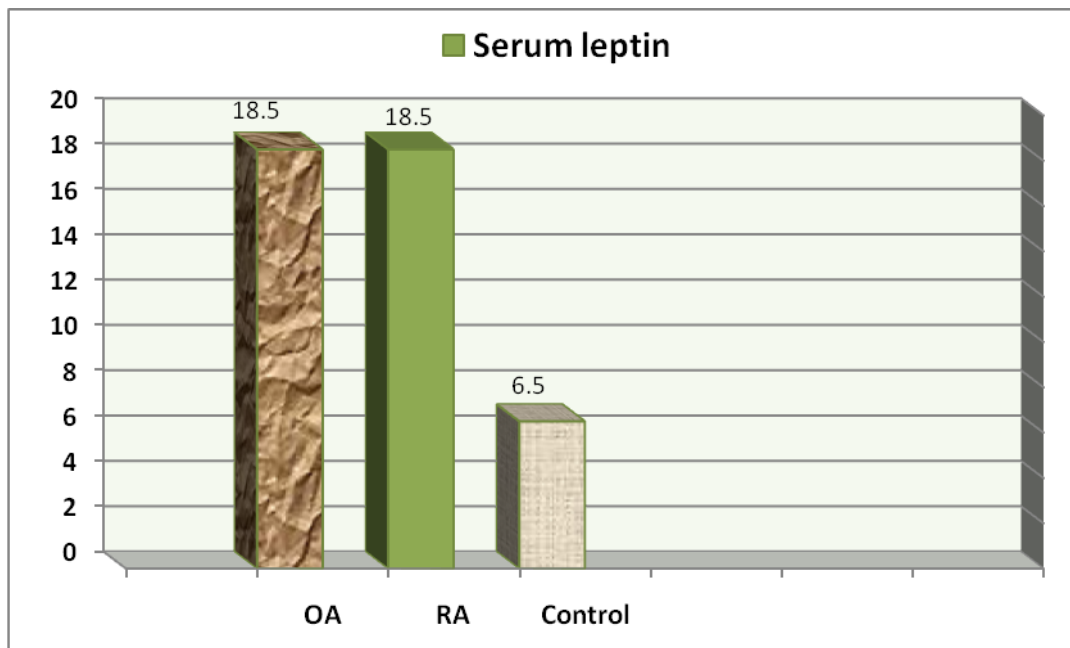
Activity indices in OA subgroups:

In obese OA patients, their WOMAC index had a mean of 73.8 ± 9.6 , WOMAC total score was 2.6 ± 0.39 , and VAS of pain was

4.9 ± 1.4 . In non obese OA patients, the mean of WOMAC index was 42.6 ± 16.3 , WOMAC total score was 1.7 ± 0.66 , HFAS was 0.9 ± 0.78 , and VAS of pain was 3.0 ± 1.08 .

Comparison between serum leptin in OA & RA and controls:

Serum leptin showed a statistically significant higher level in both OA patients and RA patients when compared to control group with p value of 0.001 for both. (fig. 1)



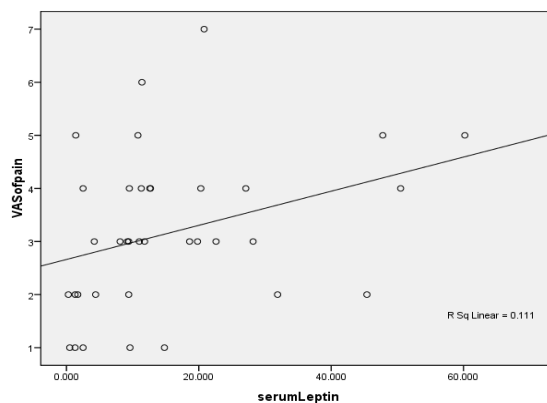
Between OA and control $P=0.001$
Between RA and control $P=0.001$

Figure 1: Serum leptin in the different groups.

Correlations between laboratory findings and activity indices in RA:

There was a highly significant positive correlation between VAS of pain and ESR

1st hr ($p=0.001$), serum leptin ($p=0.004$), RF ($p=0.001$) and CRP ($p=0.0001$). (Fig. 2)
In RA, leptin showed a significant correlation with CRP ($p=0.001$).



R= 0.33 P= 0.04

Figure 2: Correlation between VAS of pain & serum leptin in RA patients.

Discussion

In the current study, obese OA patients had more knee tenderness, inactivity stiffness, hand joints pain, DIP tenderness and DIP nodules compared to non obese ones. This was in agreement with the findings of, Jarvenpaa J, et al., 2012, who studied 48 patients with knee OA grade IV where their WOMAC scores were significantly higher compared to non-obese as regard pain, stiffness and physical function.

The RA group in the presented study showed a significant differences in activity indices in terms of HAQ index, DAS 28, VAS of pain and AI and in inflammatory markers as ESR 1st hr, CRP and RF.

Serum leptin and TAG in the presented study in RA patients also show a significant positive correlation with activity indices and inflammatory markers. This is in agreement with, Solus J, et al., 2009, who found that serum leptin was positively correlated with the DAS28 and the CRP concentration.

Also, Park Y-J, et al., 2011, investigated whether lipid profile levels correlated with RA activity in RA patients.

Recommendation

The importance of the use of weight-loss regimens in the management of OA in clinical rheumatology.

Measuring serum leptin may point to disease activity and response to treatment in RA patients. Further studies are recommended to be done on large number of patients with long term follow up to show significance use of weight loss as one of the line management in OA and RA patients.

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