

# ROLE OF SERUM LEVEL OF IL-1B AND MMP-13 IN DETECTION OF SEVERITY AND FUNCTIONAL IMPAIRMENT IN HAND OSTEOARTHRITIS PATIENTS

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## Introduction

Hand Osteoarthritis (HOA) is one of the most common chronic degenerative joint diseases. Pain and decreased function are the leading symptoms in HOA. Previously HOA was considered a pure degenerative disease, but this concept has changed and current research has demonstrated that inflammation is one of the key factors leading to the cartilage destruction.<sup>(1)</sup> Cytokines as Interleukin-1 $\beta$  (IL1- $\beta$ ) induces expression and release of proteolytic enzymes such as matrix metalloproteinases (MMPs) and aggrecanases. Chondrocyte-derived MMPs are the main enzymes involved in the breakdown of cartilage collagens and proteoglycans. Research in the area of Hand OA is important to help early diagnosis, stop the progression of the disease, and preventing disability.<sup>(2)</sup>

## Aim of the work

The aim was to determine role of serum level of IL-1 $\beta$  and MMP-13 in detection of severity and functional impairment in patients with HOA.

## Subjects and Methods

### Subjects:

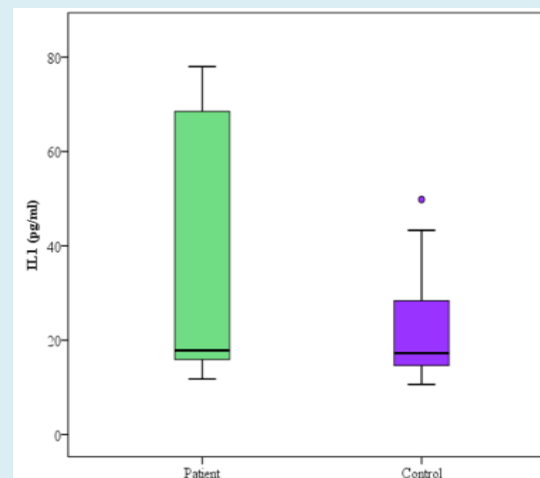
The study was carried out on 30 patients diagnosed with HOA, fulfilling the ACR 1990 criteria for diagnosis of HOA,<sup>(3)</sup> from those attending the Outpatient Clinics of Physical Medicine, Rheumatology and Rehabilitation, Faculty of Medicine, Alexandria University and Gamal Abdel Nasser hospital. Twenty age- and sex-matched healthy individuals were enrolled as a control group.

### Methods:

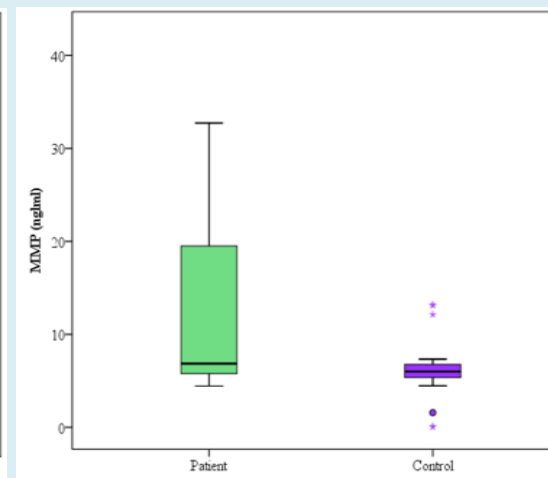
Demographic data and anthropometric measurements were recorded for all participants. Clinical characteristics of the disease including duration of disease, pattern of joint involvement, pain and disease severity as well as functional assessment of HOA were assessed. Radiographic severity of HOA was assessed by Kellgren and Lawrence (K-L) score. Serum IL-1 $\beta$  and MMP-13 were assessed using double-antibody sandwich enzyme-linked immunosorbent assay method in both patients and control.

## Results

- This study included 30 female HOA patients with a mean age of  $61.6 \pm 2.79$  years and BMI of  $31.3 \pm 5.14$  kg/m<sup>2</sup>. It also included 20 healthy females with a mean age of  $60.35 \pm 2.91$  years and BMI of  $28.57 \pm 4$  kg/m<sup>2</sup>. There was no statistical significance difference between 2 groups as regards demographic data and anthropometric measurements ( $p > 0.05$ ). Although the patients had a weaker median hand grip and pinch strength of the dominant hand, it did not reach statistical significance ( $p = 0.435$  and  $p = 0.792$  respectively).
- The mean duration of HOA was  $3.57 \pm 1.14$  years. Most patients (56.6%) had generalized OA while 43.3% had localized OA. The most commonly involved joints in HOA were the distal and proximal interphalangeal joints (78.3 and 46.6% respectively). All patients had mild to moderate pain with a median visual analogue scale of  $40.33 \pm 14.74$ . The median combined deformity and pain index was 8 ranging from 4-12. All patients had mild or moderate functional impairment (26.6% and 73.3% respectively) with a mean of  $12.17 \pm 2.51$  by the functional index for hand osteoarthritis questionnaire. The range of KL total score was between 12 – 78 with a median of 38, showing that all patients had mild-moderate radiographic HOA.
- The median IL-1 $\beta$  was 20.1(16.8-49.6) pg/ml for patients and 17.24(14.3-26.1) pg/ml for control. While, the median MMP-13 was 6.85(5.8-19.5) pg/ml for patients and 6.05 (5.4-6.8) pg/ml for control. Although IL-1 $\beta$  and MMP-13 were higher in patients than controls, it did not reach statistical significance ( $U = 204$ ,  $P = 0.057$  and  $U = 179$ ,  $P = 0.073$  respectively).
- Interleukin-1 $\beta$  showed statistically significant correlation only with pinch strength of the dominant hand. Both assays showed insignificant correlation with all other severity or function assessment measure.



**Figure 1:** Comparison between the two studied groups according to IL-1 $\beta$  levels.



**Figure 2:** Comparison between the two studied groups according to MMP-13 levels.

## Conclusion

Interleukin-1B and MMP-13 seem to have an insignificant role in detection of severity and functional impairment in mild to moderate HOA.

## Acknowledgement

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## References

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