Assessment Of Circulating Levels Of FABP-4 And Adiponectin In OA Patients
T Li¹, CH Yan², AM Xu³, YQ Song³, KY Chiu¹.
¹Department of Orthopaedics and Traumatology, HKU, Hong Kong, Hong Kong, ²Department of Medicine, HKU, Hong Kong, Hong Kong, ³Department of Biochemistry, HKU, Hong Kong, Hong Kong.

Disclosures:
T. Li: None. C. Yan: None. A. Xu: None. Y. Song: None. K. Chiu: None.

Introduction: Obesity not only increases risk of OA in weight-bearing joints but also non-weight bearing joints, indicating systemic mediators involved in OA development. One feature of obesity is the augment of adipose tissue. Adipose tissue is a truly endocrine organ that releases a number of bioactive peptides, collectively named adipokines. It is reasonable to believe that adipokines may link obesity and OA together. Obesity is now considered to be a low-grade systemic inflammatory disease. Thus the ultimate influence of obesity on OA may involve inflammatory mediators. Fatty acid-binding protein-4 (FABP-4) has been described as a novel adipokine with pro-inflammatory effects. It was reported that FABP-4 associated with obesity, insulin resistance, and atherosclerosis. [1] However limited information is available about FABP-4 and OA. Adiponectin is an important adipokine with anti-inflammatory effects. It was reported that adiponectin could play a protective role in the progression of OA.[2] This study aimed to evaluate levels of FABP-4 and adiponectin in plasma in OA patients.

Methods: For FABP-4 concentration determination, 231 Chinese subjects (154 females and 77 males) were recruited, including 141 OA cases and 90 controls (community-based). For adiponectin test, 152 Chinese subjects (112 females and 40 males) were recruited, including 122 OA cases and 19 controls (radiologically confirmed). Blood samples were collected, centrifuged immediately to get plasma and then stored at 800C until analysis. Clinical data including hypertension, diabetes mellitus and hyperlipidemia were recorded. Levels of FABP-4 and adiponectin in plasma were determined using ELISA (AIS, HKU). Mann-Whitney U test was used to compare the differences between groups. Two-sided values of P<0.05 were considered as statistically significant. Data was presented as mean±SD.

Results: FABP-4 levels in OA patients (14.33±13.87ng/ml) were higher than non-OA subjects (12.58±10.14ng/ml) (p=0.377) (Figure 1). Female subjects (16.44±13.87ng/ml) have significantly higher circulating levels of FABP-4 than male counterparts (8.13±6.11ng/ml) (p<0.0001) (Figure 2). In OA group levels of FABP-4 in plasma increased with numbers of metabolic diseases. OA patients with hypertension, diabetes mellitus and hyperlipidemia at the same time had higher levels of FABP-4 than those who didn’t have these diseases (p=0.065) (Figure 3). In control group FABP-4 levels did not go up with numbers of comorbidities (Figure 4). Adiponectin levels in OA patients (10.01±7.443μg/ml) were significantly lower compared with controls (12.77±8.550μg/ml) (p=0.021) (Figure 5). Female subjects also had significantly higher levels of adiponectin in plasma compared with male ones (p=0.009) (Figure 6).

Discussion: FABP-4 is a novel adipokine that exhibits pro-inflammatory effects while adiponectin shows anti-inflammatory effects. The result of our present study showed that female subjects had significantly higher concentrations of both FABP-4 and adiponectin in plasma. This phenomenon may have relation with hormone secretion. One important character of our female subjects is that most of them are postmenopausal. Further investigation on the differences of the circulating levels of FABP-4 and adiponectin between male and female is needed. Compared with controls, OA patients had significantly lower circulating levels of adiponectin that supported a protective role of adiponectin in the progression of OA. OA patients exhibited higher circulating levels of FABP-4 than controls. However the difference did not reach a significant level. The circulating levels of FABP-4 in OA patients showed a positive trend with the number of metabolic diseases that suggests metabolic comorbidities should be considered in OA research and OA treatment.

Significance: Adipokines including FABP-4 and adiponectin could be important factors linking obesity and OA together. This study determined circulating levels of FABP-4 and adiponectin in a large cohort to sketch their expression in OA patients that should the first step of function study of adipokines in OA research and may contribute to our understanding of the pathogenesis of OA.

Acknowledgments: I would like to express my great appreciation to Dr. Chen Cheng and Dr. Zhou Pengcheng for their valuable technical support on this project.

Figure 3

FABP-4 levels in case group.
Different numbers of comorbidities.
**p=0.065 versus none comorbidity

Figure 4

FABP-4 levels in control group.
Different numbers of comorbidities.