Study of Role of Fetuin-A in Development of Diabetic Foot in Patients with Type 2 Diabetes

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INTRODUCTION

Diabetic foot is one of the major complications of diabetes and is the main reason for nontraumatic major amputations. common clinical features of diabetic foot include ulcers, foot deformity, infection, neuropathy, PAD, osteomyelitis, and gangrene. In studies using the ankle-brachial index (ABI), which is the preferred screening technique, the prevalence of PAD (defined as an ABI <0.90) in diabetic individuals ranges from 20% to 30%. The duration and severity of diabetes correlates with the incidence and extent of PAD. In a prospective cohort study (Rundle AG., et al 2005) found a strong positive association between the duration of diabetes and the risk of developing PAD. Serum fetuin-A is a multifunctional glycoprotein, which is exclusively secreted from hepatocytes in humans. An association between insulin resistance and type 2 diabetes in individuals with high serum fetuin-A levels was reported. The role of fetuin-A and its involvement in patients with type 2 diabetes and PAD, who commonly suffer from advanced/systemic atherosclerosis, seems to be very complex and has not been fully understood as yet. Fetuin-A is increased in insulin resistance and it is an independent predictor of type-2 diabetes.Fetuin-A inhibits insulin receptor tyrosine kinase activity by inhibiting the auto phosphorylation of tyrosine kinase and IRS-1(insulin receptor substrate proteins).

AIM OF THE WORK

To investigate the relationship between the presence of different diabetic foot lesions and serum fetuin-A levels.

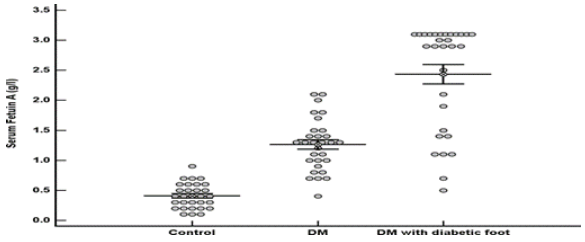
PATIENTS AND METHODS

The study was performed on 30 patients with T2DM having diabetic foot lesions, 30 patients with T2DM without diabetic foot lesions, and 30 healthy subjects as a control. Patients were recruited from the diabetic foot clinics and diabetes outpatient clinics at Ain Shams University hospital after the provision of written informed consent. Laboratory assessments included full lipid profile, glycosylated haemoglobin (HbA1c), fasting blood glucose (FBG), and post prandial blood glucose (PPBG). Serum fetuin-A level was measured using the ELISA technique. Foot assessment was done using the diabetic foot screening and risk stratification form of the Foot Action Group of the Scottish Diabetes Group.

RESULTS

Serum fetuin-A level was significantly higher in patients with diabetic foot (2.43 ± 0.88 g/l) in comparison to diabetic patients without diabetic foot (1.26± 0.43 g/l) with p value < 0.001 and both groups has a significantly higher fetuin-A levels than healthy controls. Both fetuin A and duration of diabetes were independent predictors for the occurrence of diabetic foot.

We found a significant direct correlation between age and serum Fetuin-A levels with p value of 0.0006. Positive significant correlations were also found between serum Fetuin- A level and diastolic blood pressure, HbA1c, triglycerides, and duration of diabetes (p = 0.002, 0.0001, 0.003, 0.027 respectively). The study found also that serum Fetuin-A level was significantly negatively correlated with HDL level with p value of less than 0.0001.



CONCLUSION:

The role of fetuin-A and its involvement in patients with type 2 diabetes and PAD, who commonly suffer from advanced/systemic atherosclerosis, seems to be very complex and has not been fully understood yet. In addition, low fetuin-A might result in vascular calcification and associated with mediasclerosis. So it is clear that only a normal level of fetuin-A is beneficial for humans.

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