



## Research Article

# Assessment of Serum Level of Protein Carbonyl as a Marker of Protein Oxidation in Patients with Type 2 Diabetes Mellitus

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## ABSTRACT

### Article history:

Received 7 April 2022

Accepted 30 May 2022

Available online 30 December 2022

<https://doi.org/10.47723/kcmj.v18i3.827>

**Keywords:** type 2 diabetes mellitus, protein carbonyl, glycemic control, duration of DM.



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**Background:** Diabetes mellitus is a chronic disease with an increasing prevalence worldwide and characterized by an increase in oxidative stress and inflammation. The most important factor that is responsible for oxidative stress and production of reactive oxygen species (ROS) is hyperglycemia. The major targets of ROS are proteins. The most common and widely used biomarker of severe oxidative protein damage is protein carbonyl content.

The study was designed to assess the serum level of protein carbonyl as a marker of protein oxidation in patients with type 2 diabetes mellitus and to evaluate the effect of age, body weight, waist circumference, diabetic control and disease duration on the level of protein carbonyl.

**Subjects and Methods:** This is a case-control study that included 91 patients with type 2 diabetes mellitus Eighty-five non-diabetic apparently healthy subjects matched for both age and sex with cases were enrolled as controls. Fasting blood samples were collected after an overnight fasting to measure protein carbonyl, fasting blood sugar, lipid profile, and glycated hemoglobin.

**Results:** The level of serum protein carbonyl was significantly higher in diabetic patients than in controls and positively correlated with glycated hemoglobin, age of participant and disease duration as well as with body mass index and waist circumference.

**Conclusion:** Diabetes mellitus is associated with an increase in protein oxidation in term of increase in the level of serum protein carbonyl with significant association in those who had poor glycemic control, obesity, higher age, and prolonged disease duration suggest that the carbonyl content of protein may be useful in evaluating the disease progression. Significant positive correlation of protein carbonyl together with waist circumference suggest that individual with central obesity are more susceptible to protein oxidation.

## Introduction

Diabetes Mellitus (DM) refers to a group of diverse metabolic disorders characterized by elevated blood glucose levels caused by insufficient insulin release, resistance to action of insulin, or both

(1). The prevalence of DM in Iraq had significantly raised from 19.58/1000 in the year 2000 to 42.27/1000 in 2016 (2). In Basrah, the age-adjusted prevalence of diabetes in individuals aged 19-94 years is 19.7 percent (3). The high prevalence of DM in Basrah, Iraq,