

## Mean Blood Glucose Level and Glycated Hemoglobin Level in Patients of Non-Insulin Dependent Diabetes Mellitus and its Correlation With Serum Ferritin Level

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### ABSTRACT

Sub clinical hemochromatosis has been considered as one of the probable cause for diabetes mellitus and this fact gave us an impetus to study the serum ferritin level in type 2 diabetes mellitus and correlate with HbA1c and MBG. This study was conducted in forty seven diabetic patients and compared with forty seven normal age-matched individuals as the control group. Blood samples had been taken from the subject after overnight fasting; the serum ferritin levels, HbA1C and mean blood glucose level were measured. Data were analyzed by student "t" test, chi-square analysis, and correlation coefficient test. Serum ferritin, HbA1c and MBG were significantly increased in type 2 diabetes patients. Out of the forty seven diabetic patients twenty four had hyperferritinemia, and twenty eight cases had poor control of HbA1c and MBG level. From this study it was concluded that 51 per cent of the diabetes patients had significantly higher serum ferritin level when compared to the normal and there is no correlation between serum ferritin, HbA1c and MBG but there is a positive correlation between HbA1c and MBG. Thus elevated serum ferritin concentration was associated with an increased risk of diabetes.

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### Key words :

Diabetes mellitus,  
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Diabetes mellitus is a lifelong disease which makes many people worry about the quantity and longevity life after being diagnosed<sup>1</sup>. It is a bipolar in nature with multifactorial inheritance<sup>2</sup>. People with type-2 diabetes mellitus develop characteristic micro vascular complications such as retinopathy, nephropathy and neuropathy. There is also increased risk of macro vascular complication such as cardiovascularopathy, cerebrovascularopathy and peripheral vasculopathy<sup>3</sup> although an association between elevated blood glucose level and micro and macro vascular complication has been recognized for a long time<sup>4</sup>. The complications of diabetes mellitus is influenced not only by the duration of the diabetes mellitus but also by the average level of blood glucose along with glycated hemoglobin.

A small proportion of hemoglobin A is attached to a carbohydrate moiety thus creating what is called glycated hemoglobin<sup>5</sup>. It has been established that lowering HbA1C which is a non-enzymatic binding of glucose with free amino group of globulin chain. Thus it is well recognized that near normal glycemic control prevents subsequent diabetic complications<sup>6</sup>

Even smaller accumulation of iron can alter the glucose and insulin homeostasis of the body<sup>7</sup>. This suggestion is based on the observation that increased ferritin level was associated with poor glycemic control<sup>8</sup>. Epidemiological studies also suggest that high iron body stores are associated with insulin resistance and type 2 diabetes mellitus<sup>12</sup>

Serum ferritin is an essential iron stores have been proposed as a component of insulin resistant syndrome. In a study by Salonen and Nyysnen<sup>10</sup> serum ferritin concentration adds a significant positive correlation with blood glucose and serum triglycerides. Excessive iron accumulation can induce organic damage that leads to diabetes. Saudek and Hemm<sup>11</sup> stated that 50% transfusion treated thalasemia patients have an abnormal glucose, similarly Admas and Kertesz 1991<sup>12</sup> concluded in the study that 65% of hereditary hemochromatosis patients develop diabetes mellitus.

### RESEARCH METHODOLOGY

This was a prospective case control study conducted from September 2009 to December

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