Expression and Association of Tumour Necrosis Factor-alpha and Insulin Resistance in obese subjects with type II diabetes mellitus at tertiary care hospital in Jhansi (UP).

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Introduction
Diabetes mellitus (DM) is the most widespread complex metabolic disorder among the world’s population currently affecting around 250 million people globally [1]. The burden of Diabetes Mellitus (DM) is increasing worldwide and it is estimated to reach indefinite proportions of about 450 million by year 2030. This complicated metabolic syndrome is due to either insulin insufficiency or impaired action of the insulin hormone or both (American Diabetes Association, 2004) [2]. Insulin resistance and a deficiency in insulin secretion are the major cellular basis of T2DM [3]. The action of insulin is to lower the glucose levels in the blood and to stimulate the uptake of glucose principally in muscle and liver cells, thus involved in promoting glucose oxidation and glycogenesis [4]. TNF-α is primarily secreted by macrophages, and also by a broad variety of other cells including adipocytes [5]. Tumour necrosis factor alpha (TNF-α) is an adipocytokine involved in systemic inflammation and stimulates the acute phase reaction [6]. TNF-α is now acknowledged as being a pluripotent cytokine, and the mechanisms of many of its biological activities are still not clearly understood. It is known that TNF-α can cause apoptosis, septic shock, inflammation and cachexia systemically [5]. Disturbances in TNF-α have been seen in metabolic disorders such as obesity and insulin resistance that shows that changes of TNF-α metabolism may affect the onset of type II DM and CVD [7]. HbA1c is a maker of cumulative glycaemic exposure over the preceding two to three months in diabetic patients. The aim of this study was to investigate the changing levels of TNF-α with insulin resistance and blood lipid profiles.

Material and Methods
It was a hospital based prospective study conducted at outpatient department of MLB medical college. Patients with complication of diabetes like diabetes neuropathy, nephropathy, retinopathy etc. were excluded. Epi-info software was used for statistical analysis.

Results and observations-
Table 1- Physical parameters of the study groups

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Group 1 (n=40)</th>
<th>Group 2 (n=38)</th>
<th>Group 3 (n=22)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>54.212.4</td>
<td>51.610.2</td>
<td>53.414.6</td>
</tr>
<tr>
<td>BMI (kg/m²)</td>
<td>251.4</td>
<td>25.41.6</td>
<td>27.22.4</td>
</tr>
</tbody>
</table>

Conclusion-TNF-α may be involved in the etiology of insulin resistance in type II diabetes mellitus with obesity.

References
Table 1 depicts the physical parameters of respondents' shows three variables age, BMI, and duration of diabetes with obesity. The mean age of respondents who had duration of diabetes with obesity of ≤ 5 years is 54.2±12.4. BMI is increased according to the duration i.e. patient with duration > 10 years has higher BMI compared to those whose duration is less.

Table 2- Level of changes among different biochemical parameters in three groups

Table 3 shows spearman's correlation that shows relationship of TNF-α with IR and lipid profile parameters. TNF-α is significantly associated with IR with group 1, while with triglycerides, total cholesterol and LDL it is significantly associated with group 3 respondents.

Discussion
The OPD of MLBMC, Jhansi shows a good patient output. Since there is dearth in the literature as no other study was conducted before in this region to show the expression of TNF-α and IR with obesity in diabetic patient this study was conducted. Our results are similar to the study conducted by J J Swaroop et al [8] that shows significant correlation between with HOMA IR with group 2 diabetes. Miyazaki et al [9] have concluded that TNF-α increased before the onset of diabetes and further increase was not significantly associated with insulin resistance. Bluher et al [10] reported no significant association of TNF-α in the genesis of early stages of insulin resistance. Demirbas et al [11] showed that in patients with hypertension serum TNF-α concentration increased together with increase in concentrations of insulin, and HOMA IR. No correlations were found between insulin resistance and TNF-α.

Conclusions
Recorded observations in our study support the hypothesis that TNF-α may be involved in the etiology of insulin resistance in type II diabetes mellitus with obesity. Significant association of TNF-α with blood lipid profile markers also suggest the risk of cardiovascular complications.

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Conflict of interest - none declared.