Type 2 diabetes mellitus (T2DM) is a metabolic disorder characterized by raised blood glucose due to insulin resistance and a relative insulin deficiency.

Pakistan ranks 6th among countries with the largest burden of diabetes mellitus and is expected to have a diabetic population of 14.5 million by 2025.

White adipose tissue is a recognized long-term energy store in the body and has been found to be an endocrine organ secreting bioactive molecules, called adipokines.

Chemerin is a recently found adipokine, suspected to have a role in energy metabolism, inflammation and adipogenesis, and this renders chemerin to have a link between obesity and development of T2DM.

This study aims to identify whether chemerin in conjunction with TNFα and hsCRP can act as screening marker to identify subclinical diabetes.

### Methodology

52 asymptomatic healthy volunteers and 22 known diabetic (DM) subjects were enrolled.

23 out of 52 healthy volunteers were classified as newly diagnosed diabetics (NDM), by oral glucose tolerance test (OGTT). Rest were classified as control (n=29).

Commercially available ELISA kits were used for measuring serum Chemerin, hsCRP and TNFα.

BMI was calculated by Quetlet’s index and body fat percentage was measured through bioelectrical impedance analysis (BIA).

### Results

#### Table 1: Biophysical data of the study participants

<table>
<thead>
<tr>
<th>Age (year)</th>
<th>Weight (kg)</th>
<th>BMI (kg/m²)</th>
<th>Body Fat %</th>
<th>FBS (mg/dl)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean ± SD</td>
<td>Mean ± SD</td>
<td>Mean ± SD</td>
<td>Mean ± SD</td>
<td>Mean ± SD</td>
</tr>
<tr>
<td>29.03 ± 9.77</td>
<td>62.52 ± 11.08</td>
<td>22.40 ± 3.15</td>
<td>24.65 ± 8.61</td>
<td>84.54 ± 15.94</td>
</tr>
<tr>
<td>52.18 ± 4.61</td>
<td>67.69 ± 6.91</td>
<td>25.75 ± 3.44</td>
<td>22.75 ± 6.78</td>
<td>140.61 ± 25.69</td>
</tr>
</tbody>
</table>

### Conclusions

High chemerin level was observed in 23 NDM (p<0.01; MWU) compared to controls and DM. A strong positive association was also found between serum chemerin and FBS (p<0.029; r=0.254; data not shown).

Both the hsCRP and TNFα levels were elevated in subjects with DM compared to controls (p<0.01). Similar increase in TNFα levels were also observed in NDM compared to DM (P=0.001).

The preliminary findings suggest that chemerin may serve as a potential screening marker in diagnosis of DM or predicting the risk of development of diabetes in asymptomatic individual.

Progression to clinical diabetes is associated with an increase inflammatory responses, which usually wanes off in established disease.

Based on the ROC analysis serum chemerin levels between the range of 4.68-10.98 mg/ml had approximately 70% sensitivity and 60% specificity.

### Acknowledgements

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Year II MBBS students class of 2018 Ali Zaheer Pathan, Nimra Badey, Zoya Butt and Shera Hussain.
Ethical Approval: IIR (142/11/BBF/AMS). All volunteers completed a verbal and written informed consent.

**References:**
3. Fatima et al. Elevated Chemerin levels in Pakistan Men: An Interrelation with Metabolic Syndrome Phenotypes. PLoS ONE 2013; 8(2); e57113

**Table 2: ROC analysis**

<table>
<thead>
<tr>
<th>Biomarkers</th>
<th>Cases versus Controls</th>
<th>DM versus NDM</th>
<th>NDM versus Controls</th>
</tr>
</thead>
<tbody>
<tr>
<td>hsCRP (mg/L)</td>
<td>AUC 0.130; p value = 0.032</td>
<td>0.95; 95%CI 0.79-1.00</td>
<td>0.85; 95%CI 0.69-0.99</td>
</tr>
<tr>
<td>TNFα (pg/ml)</td>
<td>0.504; 0.429-0.579</td>
<td>0.001; 0.000-0.002</td>
<td>0.015; 0.006-0.025</td>
</tr>
<tr>
<td>Chemerin (ng/ml)</td>
<td>0.764; 0.601-0.927</td>
<td>0.001; 0.000-0.003</td>
<td>0.001; 0.000-0.003</td>
</tr>
</tbody>
</table>

**Table 4-A: ROC curve for Cases versus Controls**

**Figure 4-B: ROC curve for DM versus NDM**

**Figure 4-C: ROC curve for NDM versus Controls**

**Figure 1**

**Figure 2**

**Figure 3**