THE RELATIONSHIP BETWEEN SERUM PARAOXONASE ACTIVITY AND EPICARDIAL ADIPOSE TISSUE IN HEMODIALYSIS PATIENTS

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Background

- Cardiovascular diseases is a major cause of mortality in hemodialysis (HD) patients.
- Paraoxonase-1 (PON-1) has been shown to protect against atherosclerosis by modifying lipoproteins.
- Epicardial adipose tissue (EAT) has been proposed as a new cardiovascular risk factor.

Methods

- This is a cross-sectional study conducted on 72 (43 males) patients with end-stage renal disease on regular HD.
- Serum levels of lipids profile, C-reactive protein, calcium, phosphate and parathyroid hormone (PTH) were measured.
- PON-1 activity was measured from the rate of enzymatic hydrolysis of paraoxon to p-nitrophenol.
- Echocardiography was used to measure EAT thickness (EATT).
- The correlation between PON-1 and EAT was assessed.
- Independent predictors of EAT in HD patients were assessed using multi-variate regression analysis.

Results

- There was statistically significant low mean value of PON-1 activity in the HD patients compared with control group (82.1±31.6 U/l vs. 164.3±61.5 U/L, p = 0.0001; table 1).
- There was statistically significant high mean value of EATT in the HD patients compared with control group (6.2±1.7 mm vs. 3.9±1.1 mm, p = 0.0001).
- There was a significant negative correlation between PON-1 activity and EATT (r = -0.484, p = 0.0001; fig.1), age (r = -0.255, p = 0.0308) and body mass index (BMI) (r = -0.282, p = 0.0163) and positively correlated with HDL-C (r = 0.417, p = 0.0003).
- PON-1 levels, total cholesterol, triglycerides, age and BMI were found to be independent predictors of EATT.

Conclusion

- Our study demonstrated that PON-1 activity was significantly lower in HD patients compared with healthy controls.
- PON-1 activity inversely correlated with EATT in this patient population.
- PON-1 activity was one of independent predictors of EATT in HD patients.
- PON-1 activity may be a marker of cardiovascular diseases in this population.

Table 1: Laboratory parameters of the study patients and control group.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Studied patients (n=72)</th>
<th>Control (n=24)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serum creatinine (mg/dl)</td>
<td>8.1±1.6</td>
<td>0.84±0.4</td>
<td>0.0001</td>
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<tr>
<td>PON-1 (U/L)</td>
<td>82.1±31.6</td>
<td>164.3±61.5</td>
<td>0.0001</td>
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<tr>
<td>EATT (mm)</td>
<td>6.2±1.7</td>
<td>3.9±1.1</td>
<td>0.0001</td>
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<tr>
<td>PON-1, paraoxonase-1 activity; EATT, epicardial adipose tissue thickness</td>
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</tbody>
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Fig.1: Correlation coefficient between paraoxonase activity-1 (PON-1) and epicardial adipose tissue thickness (EATT) (r=-0.484, 95% CI -0.643 to -0.284, p<0.0001)