OSTEOPROTEGERIN AS A MARKER OF MYOCARDIAL DAMAGE IN PATIENTS WITH TYPE 2 DIABETES AND ACUTE CORONARY SYNDROME

Anna M. Dąbrowska¹, Jerzy S. Tursz¹, Arleta Malecha-Jędraszek², Beata Wołoszyńska-Dunia², Anna Toruń-Jurkowska³, Janusz Kudlicki, Helena Donica³

¹Department of Endocrinology, ²Department of Biochemical Diagnostics, Chair of Laboratory Diagnostics, ³Department of Cardiology, Medical University, Lublin, Poland

Introduction

It’s known that type 2 diabetes increases the risk of cardiovascular disease. Silent myocardial ischaemia occurs more frequently in diabetics and may result in more severe coronary artery disease.

Osteoprotegerin (OPG) named also as osteoclastogenesis inhibitory factor (OCIF) is a glycoprotein which was first reported in rats by W.S. Simonet (1997) as a protein involved in the regulation of bone density (it inhibits bone resorption).

Osteoprotegerin has a molecular weight of 60 kDa as a monomer and 120 kDa as a disulfide-linked dimer. It belongs to the tumor necrosis factor receptor superfamily (TNFR) and inhibits the binding of RANK to RANKL (osteoprotegerin ligand = osteoclast differentiation factor) and thus inhibits the recruitment, proliferation and activation of osteoclasts. Osteoprotegerin is mainly secreted by bone (osteoblasts), but it is also produced by a variety of different tissues including endothelial cells, smooth muscle cells and heart muscle.

The role of OPG in the pathogenesis of:
- type 2 diabetes
- atherosclerosis
- cardiovascular complications is still studied.

Material and Methods

The STUDY GROUP was divided into subgroups:
- 14 subjects with myocardial infarction (MI)
- 13 patients with ST elevation (STEMI-MI)
- 13 patients with non-ST elevation (NSTEMI-MI)
as well as
- 10 subjects with unstable angina (UA).

The study was carried out in 36 patients (12 females and 24 males) with type 2 diabetes (DM2) and acute coronary syndrome (ACS).

For statistical analysis of the obtained results, Statistica 8.0 StatSoft was used (test U Mann-Whitney and Spearman's test were applied).

Results

Serum levels of OSTEOPROTEGERIN (pmol/l) and selected parameters in the study group.

<table>
<thead>
<tr>
<th>PARAMETERS</th>
<th>MEAN ± SEM</th>
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<tr>
<td>OPG (pmol/l)</td>
<td>7.283 ± 3.516</td>
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<tr>
<td>Age (years)</td>
<td>70.22 ± 7.62</td>
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<tr>
<td>BMI (kg/m²)</td>
<td>29.43 ± 3.47</td>
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<tr>
<td>HbA1c (%)</td>
<td>7.21 ± 1.17</td>
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<tr>
<td>Duration of DM2 (years)</td>
<td>7.90 ± 6.34</td>
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In the study group positive correlations between OPG level and troponin, CK-MB, myoglobin levels were observed.

In patients with MI had increased OPG concentrations compared to subjects with UA: 4.782±1.292 pmol/l (Z=2.807; p<0.05)

Patients with MI had increased OPG concentrations compared to subjects with UA: 4.782±1.292 pmol/l (Z=2.807; p<0.05)

OPG serum concentration was positive correlated with troponin level (p=0.003), measured few hours after MI. Patients with higher troponin level had higher concentration of OPG in the serum.

In the group of patients with MI: subjects with NSTEMI-MI had higher serum OPG levels than subjects with STEMI-MI (6.786±2.534 pmol/l) (Z=2.105; p<0.05)

A positive correlation between OPG serum level and CK-MB concentration (p=0.004), measured few hours after MI, has been observed. Subjects with higher CK-MB level in the blood had higher OPG level in the serum.

Conclusions

Osteoprotegerin (OPG) concentration:
1. is increased in diabetes with MI and subjects with NSTEMI-MI
2. correlates positively with severity of myocardial ischaemia
3. may be a risk factor for the progression of atherosclerosis and onset of cardiovascular disease
4. may predict cardiovascular events in diabetic patients