Relationship of central corneal thickness and retinal nerve fiber layer characteristics in primary open angle glaucoma

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Purpose to determine the correlation between central corneal thickness and retinal nerve fiber layer thickness in primary open-angle glaucoma (POAG) patients

Material and methods (1)

- Study terms: May - September 2011 year
- Patients: 61 persons (113 eyes) suspected and diagnosed glaucoma
  - 40 men (65.6%), 21 women (34.4%)
  - Suspected glaucoma (SG) - 15 persons (27 eyes)
  - Early POAG - 27 persons (42 eyes)
  - Moderate POAG - 27 persons (36 eyes)
  - Advanced POAG - 8 persons (6 eyes)
- Mean age - 53.9±10.4 years
  - group 1 - 59.1±9.9 year
  - group 2 - 62.6±9.8 year
  - group 3 - 68.1±7.7 year
  - group 4 - 71.8±5.4 year

Material and methods (2)

- Glaucoma history: 4.7±5.2 years
  - group 1 - 1.2±1.91 years
  - group 2 - 3.7±4.34 years
  - group 3 - 6.2±3.39 years
  - group 4 - 10.5±6.6 years
- Optical coherence tomography (Visante OCT, Carl Zeiss, USA) – central corneal thickness
- Optical coherence tomography (Cirrus OCT, Carl Zeiss, USA) – central corneal thickness
- Statistical analysis (Statistica 7.0, StatSoft, Inc., Australia-USA)

Results (1)
Analysed parameters, n=61 (M±σ)

<table>
<thead>
<tr>
<th>Group</th>
<th>IQP (mm Hg)</th>
<th>CCT (µm)</th>
<th>RNFL thickness (µm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group 1</td>
<td>19.07±4.23</td>
<td>576.8±20.16</td>
<td>105.29±10.83</td>
</tr>
<tr>
<td>Group 2</td>
<td>18.76±5.50</td>
<td>568.7±38.18</td>
<td>98.86±13.17</td>
</tr>
<tr>
<td>Group 3</td>
<td>17.31±4.36</td>
<td>558.6±29.34</td>
<td>85.11±21.19</td>
</tr>
<tr>
<td>Group 4</td>
<td>19.25±7.05</td>
<td>545.7±25.38</td>
<td>70.12±16.98</td>
</tr>
</tbody>
</table>

Results (2)
Correlation coefficient (r) between CCT and RNFL thickness in patients with different POAG, n=61

<table>
<thead>
<tr>
<th>CCT (µm)</th>
<th>SG</th>
<th>I stage</th>
<th>II stage</th>
<th>III stage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Superior sector</td>
<td>0.23</td>
<td>0.06</td>
<td>0.35</td>
<td>0.43</td>
</tr>
<tr>
<td>Temporal sector</td>
<td>0.46</td>
<td>0.26</td>
<td>0.12</td>
<td>0.28</td>
</tr>
<tr>
<td>Inferior sector</td>
<td>0.02</td>
<td>0.03</td>
<td>0.18</td>
<td>-0.06</td>
</tr>
<tr>
<td>Nasal sector</td>
<td>-0.41</td>
<td>-0.05</td>
<td>0.04</td>
<td>-0.06</td>
</tr>
<tr>
<td>Mean</td>
<td>0.18</td>
<td>0.19</td>
<td>0.21</td>
<td>0.25</td>
</tr>
</tbody>
</table>

Conclusion

- Established relationship between central corneal thickness and retinal nerve fiber layer thickness in suspected glaucoma patients and diagnosed POAG patients
- There was higher levels of CCT and RNFL levels in suspected glaucoma patients than the same in diagnosed glaucoma patients
- Moderate positive correlation was revealed between CCT and RNFL thickness in temporal sector of optic disc nerve in suspected glaucoma and early POAG (r=0.46 and r=0.26, p<0.05)
- Moderate positive correlation was found between CCT and RNFL thickness in superior sector of optic disc nerve in advanced glaucoma stages (r=0.35 and r=0.43, p<0.05)
- Moderate positive correlation was revealed between CCT and mean RNFL thickness in advanced glaucoma stages (r=0.25, p<0.05). It can indicate to progression not only optic disc nerve but CCT