Early Detection of Glaucoma Progression – Structure vs Function Correlations


*University of Medicine and Pharmacy “Carol Davila” Bucharest
**Emergency University Hospital, Bucharest, Ophthalmology Clinic

- to investigate the correlations between structure and function in early detection of glaucoma progression;

Materials and method

- prospective study on 204 patients diagnosed with POAG for a follow-up period of 4 years;
- all the patients underwent complex ophthalmological examination, C/D ratio, Disk Damage Likelihood Scale (DDLS), automated perimetry (Optopol PTS-910) and Heidelberg retina tomography (HRT III);
- structure vs function agreement was investigated according to the clinical stage of glaucomatous damage;

Results

- Structural progression was more frequently associated with perimetric progression for patients with moderate advanced glaucoma.
- For patients with preperimetric glaucoma and early glaucoma, the progression was present more often for structural test (19.04% and 29.3%), while perimetric progression was less frequent objectivated and weak correlated with structural progression (16.66%) 
- For the 15 cases diagnosed with both structural and functional progression, the locations of the structural lesion and functional defect were better correlated in cases involving the poles of the optic disc.

Detection of glaucoma progression

<table>
<thead>
<tr>
<th></th>
<th>Preperimetric glaucoma</th>
<th>Incipient glaucoma</th>
<th>Moderate glaucoma</th>
<th>Advanced glaucoma</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>C/D ratio</td>
<td>6</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>23</td>
</tr>
<tr>
<td>DDLS</td>
<td>6</td>
<td>15</td>
<td>6</td>
<td>4</td>
<td>31</td>
</tr>
<tr>
<td>Optic disc photography</td>
<td>8</td>
<td>22</td>
<td>9</td>
<td>4</td>
<td>43</td>
</tr>
<tr>
<td>TCA - HRT</td>
<td>6</td>
<td>24</td>
<td>14</td>
<td>11</td>
<td>56</td>
</tr>
<tr>
<td>Perimetry (Optopol PTS-910)</td>
<td>7</td>
<td>10</td>
<td>13</td>
<td>8</td>
<td>38</td>
</tr>
</tbody>
</table>

Structure-function agreement: 76.20% of the cases showed structural and functional progression. The highest agreement was observed in advanced stages (75.00%) and in cases involving the poles of the optic disc (78.10%).

Conclusions

- Structure-function relation depends on clinical the stage of glaucoma and the location of the glaucomatous defects
- In early stages, structural investigations can detect progression before perimetry
- In advanced stages, the functional tests are more useful for early detection of progression.