Comparison of Biometric Measurements Obtained Using 2 Noncontact Optical Biometers

Raphaël AMAR OD [1,2]

NO FINANCIAL INTEREST

[1] Clinique de la vision, Paris, France
[2] American Hospital of Paris, Neuilly/Seine, France
PURPOSE

Measurement accuracy of a new optical biometer AL-Scan (Nidek) compared to the IOL Master V.5 (Carl Zeiss Meditec) device.

SETTING

Clinique de la Vision, Paris, France

METHODS

In a prospective clinical study biometric measurements with intra-ocular lens power calculation using the AL-Scan device were performed on 25 eyes of 13 patients. Measurements were repeated using the IOL Master V.5 device. Results were elaborated using Pearson's correlation for Axial length (AL), mean Keratometry (Km), Anterior Chamber Distance (ACD) and IOL calculation (118, SRKT formula).
Many measures were performed with both devices on each eye included:
1) Mean Axial Length x 5
2) Mean central keratometry (Km, diopters) x 3
3) Anterior Chamber Distance (ACD, mm) x 1
4) Simulation of IOL calculation with SRKT formula, and A constant = 118

The data correlation analysis was evaluated using Spearman’s rank correlation coefficient (by XLstat software)
### RESULTS

<table>
<thead>
<tr>
<th></th>
<th>AL-Scan (n=25)</th>
<th>IOL Master (n=25)</th>
<th>Spearman Coef.</th>
<th>p-values</th>
</tr>
</thead>
<tbody>
<tr>
<td>AL (mm)</td>
<td>24.18 ± 1.64</td>
<td>24.15 ± 1.66</td>
<td>R = 0.997</td>
<td>p &lt; 0.0001</td>
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<tr>
<td></td>
<td>[21.42 ; 26.96]</td>
<td>[21.41 ; 26.98]</td>
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<tr>
<td>Km (D) 2.4 mm zone (AL-Scan)</td>
<td>44.17 ± 1.79</td>
<td>44.22 ± 1.77</td>
<td>R = 0.989</td>
<td>p &lt; 0.0001</td>
</tr>
<tr>
<td></td>
<td>[41.51 ; 47.40]</td>
<td>[41.51 ; 47.58]</td>
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<tr>
<td>Km (D) 3.3 mm zone (AL-Scan)</td>
<td>44.16 ± 1.79</td>
<td>44.22 ± 1.77</td>
<td>R = 0.982</td>
<td>p &lt; 0.0001</td>
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<td>[41.51 ; 47.47]</td>
<td>[41.51 ; 47.58]</td>
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<tr>
<td>ACD (mm)</td>
<td>3.54 ± 0.56</td>
<td>3.50 ± 0.57</td>
<td>R = 0.977</td>
<td>p &lt; 0.0001</td>
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<tr>
<td></td>
<td>[2.48 ; 4.39]</td>
<td>[2.24 ; 4.42]</td>
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<tr>
<td>IOL Calculation (D) SRKT, const A 118</td>
<td>17.50 ± 5.52</td>
<td>17.48 ± 5.49</td>
<td>R = 0.999</td>
<td>p &lt; 0.0001</td>
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<td></td>
<td>[7.00 ; 27.50]</td>
<td>[6.50 ; 27.00]</td>
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</tbody>
</table>

#### AL-Scan
- 2.4 mm & 3.3 mm Keratometric measurement
- ACD Measurement, Scheimpflug analysis

#### IOL Master
- 6 points of keratometric measurement (2.5 mm zone)
- ACD Measurement
Spearman’s rank correlation coefficient evaluation between results of IOL Master and AL-Scan were respectively: 0.996 for mean axial length; 0.996 for mean keratometry (with 2.4 mm diameter AL-Scan measurements), 0.993 for mean keratometry (with 3.3 mm diameter AL-Scan measurements); and 0.999 for IOL calculation (SRK T, A const 118).
CONCLUSION

In our experience, there was no statistically significant difference in AL, Km, ACD and IOL calculation evaluation between both groups.

The new AL-Scan device performs accurate biometric measurements and intra-ocular lens (IOL) power calculation. IOL calculation results obtained using the AL-Scan device are similar to those achieved using the IOL Master device (V.5) which is the most widely used partial coherence interferometer.

Bibliography