Sensitivity and specificity of the Optomap for fundus screening in a Hong Kong Chinese population

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Purpose
To investigate the sensitivity and specificity of the Optomap for fundus screening in a Hong Kong Chinese population

Methods
Fifty-four eyes identified with retinal / choroidal signs and eight normal eyes were recruited from 31 Hong Kong Chinese subjects from the Hong Kong Polytechnic University Optometry Clinic. Informed consent was obtained from all subjects. Photodocumentation of fundal changes were taken by the Optomap under undilated conditions before a dilated fundus examination. All Optomap images were acquired by a clinician under standard procedures, and all dilated fundus examinations were performed by another clinician utilizing binocular indirect ophthalmoscopy (BIO) and slit lamp biomicroscopy with a fundus lens. Then, Optomap images were evaluated by other four investigators for identifying retinal features under masked condition. In our study the Optomap investigators had no previous experience of Optomap but they familiarized the Optomap by viewing sample image library provided by the manufacturer’s database before photo evaluation. All results were matched with the international classification of disease ninth version (ICD-9-CM) for each type of retinal feature, and recorded on a pre-designed form. Screening results were compared with those obtained using a dilated fundus examination as the gold standard.

Results
The sensitivity and specificity of the Optomap averaged 76.4% and 71.9% respectively. Some features were commonly mis-detected by all four observers, despite under careful observation. They were white-without-pressure (1 case), lattice degeneration (2 cases), paramacular drusen (1 case), and pigmentary change (1 case).

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<thead>
<tr>
<th>Definition of sensitivity and specificity</th>
<th>Optomap</th>
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<tr>
<td>Dilated fundus examination</td>
<td>Positive</td>
<td>Negative</td>
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<tr>
<td>Positive</td>
<td>a</td>
<td>b</td>
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<tr>
<td>Negative</td>
<td>c</td>
<td>d</td>
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- Sensitivity = a / (a + b)
- Specificity = d / (c + d)

Sensitivity (%) | 75.9 | 77.8 | 85.2 | 66.7 | Average | 76.4 |
Specificity (%) | 75.0 | 75.0 | 62.5 | 75.0 | 71.9 |

Discussions
The sensitivity and specificity found in this study is similar to the previous report by Friberg et al. (2003). The Optos has several distinctive differences compared to the conventional fundus photos. The picture looks distorted because of the elliptical mirror in the Optos imaging system. The elliptical mirror compressed the peripheral retina into a smaller area as compared to the central retina. Moreover, the colour of Optomap is an artificial composite of the red and green light sources, thus it appears somewhat different from the conventional fundus pictures.

Among those features that were commonly missed, the detection can be enhanced. For example, paramacular drusen could be detected by contrasting the red laser channel and green laser channel. The other factor affecting detection of retinal signs was the field of view. BIO covered a bigger field of view than an Optomap photo. Although there appears to be a tremendous growth in Optomap usage around the world, many eye care professionals might not be experienced in reading Optomap. With experience, Optos offers an alternative option for non-dilated fundus screening.

Conclusions
We found sensitivity and specificity of the Optomap for fundus screening to be 76.4% and 71.9% respectively, which is similar to previous findings. The practitioners do require a relearning of reading the Optos photos, with that experience, Optos offers an alternative option for non-dilated fundus screening.

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Reference