Validation of the online fitting app OptiExpert for multifocal soft contact lenses

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Purpose:
The multifocal soft lens calculator component of the OptiExpert app was developed by CooperVision, Inc. to make multifocal contact lens fitting simpler and more efficient. Comparisons between final dispensed lens powers and retrospectively obtained app-recommended lens powers were conducted to validate the software.

Method:
The dispensed lens data came from a previous clinical trial involving 55 subjects fit with comfilcon A multifocal lenses (B-MF); Biofinity Multifocal, CooperVision. The lens had been fit and dispensed according to the manufacturer's fitting guide and lens powers were optimised after 3-10 days for all subjects, to determine the final dispensed lens power (Dispensed-Rx). Subsequent to the completion of the clinical trial, the subjects' refraction data (sph, cyl, add, ocular dominance) were entered into the OptiExpert app. The app-recommended power for each eye (OptiExpert-Rx) was compared to the Dispensed-Rx using Bland-Altman plots and correlation analysis.

Results:
The 55 presbyopes (49F, 6M) had a mean (±SD) age of 51 (±5) years. The refraction range across all 110 eyes was +1.25 to -3.25 DS with ≤-1.00 DC, with reading additions from +1.25 to +2.50 D. In the clinical trial across both the initial and the optimized fitting, 71% (39 out of 55) subjects achieved the final Dispensed-Rx with just one pair of trial lenses, 98% (54 out of 55) achieved the Dispensed-Rx with two pairs of trial lenses.
Comparing Dispensed-Rx to OptiExpert-Rx for distance sphere power, the Bland-Altman plot showed a mean difference of +0.03 DS, 95% limits of agreement: -0.36 to +0.43. The OptiExpert-Rx sphere power was exactly the same as the Dispensed-Rx for 63% (69) of eyes and within 0.25DS for 94% (103) of eyes. The OptiExpert-Rx was significantly correlated with Dispensed-Rx (r = 0.989; p <0.0001). For reading addition power, the Bland-Altman plot showed a mean difference of -0.03 DS (95% limits of agreement: -0.72 to +0.67). The OptiExpert-Rx addition power was identical to the Dispensed-Rx for 60% (66) of eyes and within 0.50DS (1 step) for 96% (106) of eyes. OptiExpert-Rx reading additions, were significantly correlated with Dispensed-Rx (r = 0.656; p <0.0001). For the distance/near centre design allocation, the OptiExpert-Rx was identical to the Dispensed-Rx for 69% (38) of subjects. For the remaining 17 subjects, 15 differed in only one eye while two differed in both eyes.

Conclusion:
The B-MF distance power, reading addition and distance/near centre design recommended by the OptiExpert app were all in close agreement with the final dispensed lens details determined by investigators using the manufacturer's fitting guide, and exactly matched in the majority of eyes. Given this high level of agreement, the OptiExpert multifocal soft lens calculator can be used as a clinical tool to aid B-MF fitting success, potentially saving valuable chair time by recommending an appropriate initial trial lens.

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