

ARVO 2014 – Abstract

Program Number: 4500 **Poster Board Number:** D0160

Presentation Time: 8:30 AM–10:15 AM

Screening for refractive errors in children using the 2WIN, binocular refractometer.

Giuliano Stramare. Oculistica, Ospedale Sacro Cuore, Negrar, Italy.

Purpose: To evaluate the performance of the 2WIN binocular refractometer in measuring refractive errors by comparing them with Retinomax K-plus2 and TONOREF II Autorefractor.

Methods: 208 children (416 eyes) were examined consecutively in our office. Each patient was screened with the 2WIN refractometer, the Retinomax and the Nidek autorefractometer on the same day as part of a comprehensive pediatric ophthalmic examination. The age range was between 10 months and 13 years.

Results:

Compared to the Retinomax

The mean difference in the sphere before cycloplegia was 0.40 D with a standard deviation of 1.19 D; after cycloplegia was -0.56 D with a standard deviation of 0.93 D.

The mean difference in the cylinder before cycloplegia was -0.2 D with a standard deviation of 0.5 D; after cycloplegia was -0.04 D with a standard deviation of 0.79 D.

Compared to the Nidek TONOREF II

Mean difference in the sphere before cycloplegia was -0.02 D with a standard deviation of 1.28 D; after cycloplegia was -0.56 D with a standard deviation of 1.01 D.

Mean difference in the cylinder before cycloplegia was 0.07 D with a standard deviation of 0.49 D; after cycloplegia was 0.15 D with a standard deviation of 0.68 D

Conclusions: 2WIN refractometer have good performance in detection of refractive errors compared to Retinomax K-plus2 and NIDEK TONOREF II Autorefractor.

2WIN refractometer could be an easy-to-use, safe and reliable screening method of refraction in young children, especially for ophthalmologists unskilled in retinoscopy, orthoptists and pediatricians.

Commercial Relationships:

Giuliano Stramare, None

Program Number: 433 **Poster Board Number:** D0052

Presentation Time: 8:30 AM–10:15 AM

Prevalence of visual alterations in Italian children using Binocular refractometer and vision analyzer

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Purpose: To report refractive and visual defect in pre-school population of 3 typical Italian cities (Milan, Bologna, Latina-Rome) with a new device (Automatic retinoscopy 2WIN) for fast screening.

Methods: Observational study of 8573 children from 1 to 3 years using automatic retinoscopy 2WIN developed on 1 year. Centers of screening: S. Lucia Hospital in Bologna, Centro Studi Iprovisione Milano, Eye Clinic La Sapienza -S. Maria Goretti Latina-.Rome. 10 ophthalmologists, 12 orthoptists.

Results: 8573 children; in 1471 cases (17,2%) we found out a visual anomaly of any kind that was not previously noticed. A visual defect already known was present in 1948 ch. (22,8%). The defects are not related in any way with sex belonging to: 17,3% male, 17% female. Refractive defects were present in 1414 out of 8573 ch. (16,5%) and in 2520 out of 17146 eyes examined (14,7%). 855 (10%) ch. were wearing glasses and 378 ch. had glasses with a wrong correction (44,2% of wearing glasses, 4,4% of total cases). Ocular motility was altered in 817 out of 8573 ch. (9,5%) with higher prevalence of exophoria (422 cases, 5,2%)

In 1324 cases out of 1471 (90%) ophthalmological control confirmed the suspect of visual defect.

False positive were 1147 (10%)

Conclusions: Visual abnormalities previously not shown were 17,2%, particularly high if we consider high social and economical level in the cities analyzed. Parents suspected anomalies in 20% of cases. The Automatic retinoscopy 2Win verification in visual function of the patient allows early analysis of the refractive defect, ideal for babies, children and uncooperative patients.

The tool is not limited to the analysis of the refractive defect, but it is very useful as a tool for early diagnosis of phorias, instability of fixation, incorrect position of the face (tilting).

These data confirm that ophthalmological control is needed in very young population even if ocular situation seems normal. Parents' observations are not enough. 15% of children sent to ophthalmologists did not continue on with necessary controls.

Commercial Relationships:

Lucia V. Scorolli, None;

Sergio Zaccaria Scalinci, None;

Paolo G. Limoli, None;

Enzo M. Vingolo, None;

Daniela Domanico, None

Program Number: 435 **Poster Board Number:** D0054

Presentation Time: 8:30 AM–10:15 AM

Higher eccentricity of the LED source in photorefraction extends the range of measurement to high ametropias

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Purpose: Eccentric photorefraction is the most utilized method to screen for refractive errors in young children. However, the currently available instruments have a limited range of measurement (± 5 diopters). We investigated whether a higher eccentricity of the LED source in a photorefractometer is able to measure high ametropias (HA) defined as spherical equivalent greater than ± 5 D.

Methods: The refractive status of consecutive patients accessing a private office for ophthalmic examination was assessed without cycloplegia with a standard autorefractometer (Canon R50) and with a novel videorefractometer (2WIN, Adaptica, Padova, Italy) equipped with both the standard eccentricity LEDs and a customized high eccentricity (5.5 cm) LED. To enrich the study group, soft contact lenses were also used in 10 emmetropic eyes to create HA.

Measurements from the customized instrument were obtained by manually calculating the slopes of the light crescent using the software ImageJ. A ROC curve analysis of 4 cut off intervals (± 5 , ± 7 , ± 10 , ± 15 D) was performed to assess the diagnostic accuracy of standard and customized 2WIN, taking the autorefractometer readings as gold standard.

Results: Measurements were obtained from 89 eyes, with a mean spherical equivalent error of $-3.8D \pm 7.0D$ (range: -22 to +13D). Among these, 36 HA data sets were obtained: 26 spontaneously occurring in patients, and 10 generated with contact lenses. A comparison of AUC values between the standard and customized 2WIN measurements revealed a statistically significant greater diagnostic accuracy of the customized LED for cut-off intervals greater than ± 5 D.

Outlier analysis of critical slopes values confirm the results from the ROC curve analyses.

Conclusions: The 2WIN videorefractometer with customized high eccentricity LED can efficiently measure high ametropias, thus increasing the diagnostic usefulness of the photorefraction method.

Commercial Relationships:

Mario Angi, TV2012A000151 (P);

Oren M. Feuerman, None;

Andrea Leonardi, None