Reliability of vergence facility measured subjectly. There are agreement with a new vision analyser?

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**Purpose:** To determine the agreement between the results of the near vergence facility (VF) obtained objectively in a prototype of a new fully autonomous and automated vision analyser (Eye and Vision Analyzer, EVA, DAVALOR, Spain) with the subjective method commonly used in clinics. Also were determined the intra-subjects and inter-examiner repeatability.

**Methods:**

This study was performed in two groups using two different methods. The subjective vergence facility (SVF) was performed in 54 young healthy subjects (mean age 21.5±1.5 years) and the objective vergence facility (OVF) was performed in a subsample of 16 subjects (was 22.1±2.7 years). All of them didn’t have previous history of strabismus or amblyopia. The monocular visual acuity required at far and near distance was ≥ 0.0 logMAR.

**Subjective vergence facility (SVF)**

The measurements were performed with flip prism of 3ΔBI and 12ΔBO during 1 minute.

- Intra-observer repeatability: The measurements were performed in 2 sessions, separated 5-10 days and done by the same examiner.
- Inter-examiner repeatability: The measurements were performed in the same session by 2 different examiners, in a random order.

**Objective vergence facility (OVF)**

The measurements were performed in 3 different combination of prism magnitude:

- C1: 3ΔBI / 12ΔBO
- C2: 8ΔBI / 8ΔBO
- C3: 6ΔBI / 6ΔBO

Measurements were done during 20 seconds in each combination for each measurement in random order and repeated three times.

**Results:**

Inter-examiner and intra-observer repeatability for SVF

- Inter-examiner reliability: The mean difference was 2.06±2.7 cpm (p<0.001) and the Pearson Coefficient (PC) was 0.89 (p<0.001) (Graph 1).
- Intra-observer repeatability: The mean difference was 1.06±4.2 cpm (p=0.74) and the PC was 0.74 (p<0.001) (Graph 2).

**Agreement between OVF and SVF**

- The mean OVF values was 9.5±11.3 cpm for C1, 14.1±9.3 cpm for C2 and 20.8±8.2 cpm for C3.
- The mean SVF values was 18.3±1.9 cpm.
- The best agreement was between SVF and OVF (C3) with a difference of 2.5±7.2 cpm (p=0.19) and PC of 0.58 (p=0.02) (Graph 3).
- In ANOVA test there were not statistically significant differences (p=0.136) between all four methods.

**Conclusions:**

1. The EVA prototype is a useful device to objectively measure VF. The OVF measured with EVA (6ΔBI/6ΔBO criteria) have a good agreement with the SVF (3ΔBI/12ΔBO criteria).
2. For SVF the inter-examiner results show that the agreement is better than the intra-observer results.
3. Further studies can improve the best prism combination to optimize the clinical pass/fail cut-off with EVA.

**References:**


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