Telemedicine screening program for glaucoma using tonometry, scanning laser opthalmoscopy (HRT) and scanning laser polarimetry (GDx)

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Purpose: Assessment of a Telemedicine Screening Program for glaucoma using imaging devices.

Methods: Cross-sectional study in a population-based sample. 414 subjects were examined with HRT-3, GDX-VCC, rebound tonometry (Icare) and pachymetry. All subjects with at least 2 of the 3 following criteria were considered suspects and referred to a glaucoma consultation: global Moorfields REGRESSION ANALYSIS borderline (BL) or outside normal limits (ONL), NFI value of GDx $\geq 30$, and tonometry $\geq 21$ mmHg. Only good quality images were considered (see below) for calculations. Examination at the primary care centre was performed by 4 technicians and the results were sent to the reading centre where they were checked for quality and final classification. Glaucoma consultation included tonometry with Goldman applanation tonometry, Humphrey perimetry, optic disc photographs, gonioscopy and ophthalmic examination at the Hospital. Subjects were diagnosed of glaucoma if both optic nerve and visual field were considered as glaucomatous.

Results: Intraocular pressure was over 21 mmHg in 20 eyes (4.8%). Of the 828 eyes, operators could obtain good quality images in all but 53 eyes (6.4%) with HRT and in all but 69 (8.3%) with GDx. The images resulted outside normal limits (ONL) in 173 eyes (20.3%) with HRT and in 93 eyes (11.2%) with GDx. The screening program detected 51 patients as glaucoma suspects. Only one patient had high pressure and abnormal HRT and GDx, 21 resulted ONL in HRT and GDx, 4 had high pressure and GDx ONL, and 6 had high pressure and HRT ONL. Five subjects (10%) did not accept attending the glaucoma consultation and 46 completed the study. At glaucoma consultation the final diagnosis was: 13 glaucomas, 2 ocular hypertensives, 21 glaucoma suspects and 10 normals.

Conclusion: The telemedicine screening program based on HRT, GDx and tonometry detected 51 glaucoma suspects (4.3%) with a positive predictive value of 76%.