Validation of the Compressed Assessment of Ability Related to Vision (CAARV), a Performance Based Measure, in a South Indian Population with Glaucoma

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2018

UMMS Capstone for Impact
Branch: Diagnostics and Therapeutics

Project Summary

Background, Significance:
The need to create global metrics for outcomes in the field of ophthalmology remains great as they can be used to drive patient monitoring and quality improvement activities at eye care centers. Presently, several patient-reported outcomes (PROs) for glaucoma have been validated in Indian populations.

Gothwal, VK, et al. utilized the Glaucoma Quality of Life-15 (GQL-15) questionnaire with 198 LV Prasad Institute patients classified as mild, moderate, and severe visual field loss groups (1). Due to poorly fitting questions via Rasch Analysis, the questionnaire was pared down to 10 questions and named the Glaucoma Activity Limitation-10 (GAL-10) questionnaire. This cross-sectional study demonstrated a consistent pattern of worsening function with increasing visual field loss; however, the utility of the questionnaire in patients with mild disease was poor.

Additionally, the 33-item Indian Visual Functioning Questionnaire (IND-VFQ) was developed to measure the visual symptoms, psychosocial impact, and functioning of patients with a broad range of eye conditions (2). Limited additional studies utilizing the IND-VFQ in glaucoma patients have been published. Most notably, Arora, et al. utilized it in a longitudinal study of 62 patients newly diagnosed with moderate to severe primary glaucoma (3).

Spaeth and colleagues have compared the validity of clinical measures, performance-based measures, and PRO measures to detect changes in outcomes that are relevant to patients with glaucoma in Philadelphia, Pennsylvania, USA (4, 5). The 4-item Compressed Assessment of Ability Related to Vision (CAARV), a performance-based measure (PBM), was adapted from the 9-item Assessment of Disability Related to Vision (ADREV) (6). These instruments can be easily modified to suit other cultural and linguistic contexts and have been shown to have excellent face and content validity.

A PBM has yet to be validated and utilized in an Indian population. This measure can provide an objective assessment of how glaucoma affects the daily function of patients, beyond subjective PROs and traditional clinical measures. This study aims to validate the CAARV for a south Indian patient population with glaucoma and to determine the relationship between CAARV results and the clinical and subjective measures used in glaucoma patients. We hypothesize that this instrument will demonstrate adequate validity within this population and correlate with existing PROs and clinical measures.

Patient Recruitment:
With the assistance of on-site research colleagues, participants will be enrolled at Aravind Eye Hospital (AEH) - Madurai. Participants will be identified during the cross-sectional data collection period in February 2018. Demographics will be collected and past medical and ocular history will be reviewed in the medical record.

Inclusion criteria are: individuals receiving care at AEH with glaucoma but without other ocular comorbidities. Visual loss can range from none to far-advanced. The glaucoma patients will have already been examined and diagnosed at AEH by a glaucoma specialist based on optic nerve examination, repeatable visual field (VF) defects, and the absence of other causes of optic neuropathy. Patients who have primary open-angle glaucoma, primary angle-closure glaucoma, “normal pressure glaucoma,” pseudoexfoliative glaucoma, pigmentary glaucoma, inflammatory glaucoma, neovascular glaucoma, traumatic glaucoma, plateau iris syndrome, or ocular hypertension are eligible to participate.

The patients will be subdivided into four categories based on the Hodapp-Parish-Anderson System: HPA-0 (none), HPA-1 (mild), HPA-2 (moderate), HPA-3 (severe) (7). These categories are based on the amount of field damage as demonstrated by the visual field loss recorded by Humphrey Visual Field perimetry. A grid has been developed to include different amounts of visual field loss, and 40-60 patients will be recruited within each category. Patients will not be discriminated based on visual acuity, although it will be collected as an additional data point. As eligible cases are enrolled, the grid block will be updated with subject fit. As the study progresses, patients will be selected depending upon which blocks on the grid were still not filled.

Exclusion criteria are: Inability to understand and respond to spoken Tamil or English; ocular surgery within 3 months; laser treatment within 1 month; significant neuromuscular problems; or medical comorbidities that prevent completion of the study protocol, such as diagnosed cognitive impairment (e.g. dementia), or diagnosed severe mental illness (e.g. schizophrenia). "

Action Items/Outcome

"Experimental Methods and Design:
Patient participants meeting study criteria will be consented and enrolled in the study. Approximately 200 patients will be recruited to provide adequate item calibrations (8).

Our project aims to cross-sectionally validate several instruments in a heterogeneous population of patients with glaucoma in southern India. Patient demographics will be collected along with four main outcomes:
1) Responses to the IND-VFQ 33 questionnaire (2).
2) 7-item glaucoma symptom checklist (9).
3) Compressed Assessment of Ability Related to Vision (CAARV). The CAARV consists of four tasks: finding items in a room; sign recognition; facial recognition; and motion detection. This test will be modified for the South Indian population with appropriate signs and facial expressions (6).
4) Clinical data will be collected through chart review. These data include: visual acuity; visual field indices; and SPARCS contrast sensitivity (10).

Statistical Analyses:
Descriptive statistics will be computed for demographics, clinical measures, PBM, and quality of life measures. Rasch analysis will be used to characterize each patient based on total CAARV score. Construct validity will be evaluated by examining the correlations between the CAARV scores, the various clinical measures of visual function, and the other PROs. "

Conclusion/Reflection

Anticipated Results and Potential Problems:
We anticipate that these instruments will demonstrate adequate validity in a South Indian population with glaucoma. Once validated in February 2018, a longitudinal cohort study may be pursued to test whether outcome measures such as IND-VFQ, CAARV, or SPARCS contrast sensitivity are able to capture changes associated with glaucoma progression that may be more relevant to quality of life and functioning than standard clinical measures.

Potential problems relate primarily to logistics, particularly the patient recruitment and the translation of the CAARV to Tamil and the south Indian context.

References:
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