Abstract
Optometric or visual acuity assessment is an essential part of ophthalmologic examination. Visual acuity measurement serves as a tool for screening of ophthalmic disorders, as well as diagnosis and monitoring of refractive errors and other causes of reduced acuity. Persons with diabetes may experience situations which impair visual acuity, or which impact the utility of refractive visual acuity assessment. This communication shares guidance as to when and when not to perform visual acuity charting in persons with diabetes.

Keywords: Eye, Ophthalmopathy, Optometry, Premature cataract, Retinopathy, Type 1 diabetes, Type 2 diabetes, Visual acuity.

Introduction
The eyes are an important sense organ, and healthy eyes are an integral part of a healthy body. Diabetes may affect the eyes in multiple ways. While maximum discussion focuses on the long term microvascular complication of retinopathy, diabetes can lead to other acute and chronic ophthalmic disorders as well. Some of these disorders include dry eye, infections, iritis, glaucoma and cataract. Most of these illnesses impact visual acuity (VA) at some course in their natural history. At the same time, persons with diabetes are equally prone to disorders of VA that occur in the general population, such as myopia, hypermetropia and presbyopia. Most eye disorders worsen with poor glycaemic control as well.

An optometric or VA assessment, therefore, becomes an essential part of an ophthalmologic examination in a person with diabetes. Best practices and guidelines regarding optometric examination are available in published literature. However, there are no recommendations regarding the relevance or suitability of VA measurement specifically in persons with diabetes. This may contribute to suboptimal eye care in persons living with diabetes in developing countries. This brief communication describes the role of VA assessment in general and shares guidance regarding indications for optometric examination in persons with diabetes.

Visual Acuity Assessment
Visual acuity (VA) assessment may be conducted as a

- Component of routine ophthalmic care
- Screening tool for ophthalmic disease, including retinopathy, in resource constrained settings
- Screening and diagnostic tool for refractive correction
- Monitoring tool for retinopathy

Visual acuity (VA) assessment may be assessed as

- Presenting (VA) examination (non dilated state) using
  - Distance or near eye chart
  - 6/12 hand held chart
  - ‘pinhole’ option if visual
- Refracted VA examination(dilated state) using
  - 3-4 metre VA lane
  - High contrast VA chart

Visual Acuity in Diabetes
Multiple factors influence VA in persons with diabetes.

Table: Factors which influence visual acuity.

<table>
<thead>
<tr>
<th>General Health</th>
<th>Metabolic Health</th>
<th>Ophthalmic Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall medical fitness</td>
<td>Current glycaemic status</td>
<td>Conjunctural disorders</td>
</tr>
<tr>
<td>Neuro cognitive health :ability to understand optometrist's instructions</td>
<td>Variability in glycaemia</td>
<td>Corneal disorders</td>
</tr>
<tr>
<td>Non-ophthalmic pain/discomfort ; ability to concentrate on optometry process</td>
<td>Intra ocular pressure</td>
<td>Anterior chamber disorders</td>
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<tr>
<td></td>
<td>Variability in intra ocular pressure</td>
<td>Status of lens</td>
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<td></td>
<td></td>
<td>Posterior chamber disorders</td>
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<tr>
<td></td>
<td></td>
<td>Retinal disorders</td>
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These factors may be linked to general, metabolic and ophthalmic health, as well as to mode of treatment. Some of these factors are listed in Table. An understanding of these factors helps one suggest ‘best practices’ for VA assessment in persons with diabetes.

**Suggestions for Best Practice**

**Routine Care**
- VA measurement, if assessed as a component of routine ophthalmic care, can be performed in every person with diabetes who is neuro cognitively fit to undergo the assessment.
- The referral slip for the optometrist/ophthalmologist should include details of medical and metabolic condition of the patient, including anticipated changes in treatment or glycaemic control.
- VA measurement, as a screening tool for diabetic retinopathy, may be used in resource constrained health settings. One must be aware, however, that VA impairment is a late sign of diabetic retinopathy, and is not sensitive enough to diagnose early cases.
- Optometric suspicion of any diabetic eye condition should prompt referral to an endocrinologist.
- Optometric suspicion of a sight threatening condition related to diabetes should prompt immediate referral to an endocrinologist.

**Monitoring**
- VA measurement is useful as a monitoring tool in persons being treated for diabetic retinopathy or other ophthalmic conditions.

**Refractive Error Diagnosis**
- VA measurement, for correction of refractive error, should be performed in persons with diabetes who have
  - Stable general physical health
  - No acute illness, i.e. emergency medical, surgical condition
  - Adequate neuro cognitive function
  - Stable glycaemic and vascular control
  - No anticipated major changes in glycaemia and blood pressure over the coming weeks
  - No major change in glucose lowering regimens

  - Ocular Health
  - No transient / acute anterior chamber disease, e.g., conjunctivitis, keratitis
  - No anticipated medical or surgical procedure which is expected to change VA in the coming days, e.g., cataract surgery
  - VA measurement, for refractive correction, should ideally not be performed in persons with diabetes who are experiencing
    - An acute or transient medical, surgical or ophthalmic illness, including infections
    - Symptomatic hyperglycaemia &/or ketosis
    - Sudden changes in glycaemic control
  - If VA is measured in such situations, patients must be counseled that the optometric prescription may change once the acute phase of illness is over, &/or glycaemic stability is achieved.
  - The decision to purchase vision improving devices such as spectacles or contact lenses should be based upon the individual needs and preferences.

- If VA is measured in such persons, the optometrist should document the significant medical, surgical or ophthalmic health history in his/her prescription notes. Health care providers should be aware of the possibility of fluctuating myopia in diabetes.

**Summary**
Simple suggestions such as those listed above should help maximize the efficacy and efficiency of VA measurement in persons with diabetes. Awareness of these facts will also facilitate better communication between persons with diabetes and their health care team, as well as within the health care team i.e. optometrist, ophthalmologist and endocrinologist.

**References**


