The prevalence and causes of blindness and vision impairment in Trinidad & Tobago

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Introduction

- The WHO Global Action Plan 2015-2019 “Universal Eye Health” reiterates the need for robust evidence on the magnitude and causes of vision impairment and on current eye care services to guide strategies to address the burden of avoidable vision loss.
- The Global Burden of Disease Study identified a paucity of epidemiological data for the Caribbean region: the last comprehensive, national survey was conducted 20 years ago (Barbados Eye Survey).
- Trinidad and Tobago has a population of 1.3 million with an aging demographic profile and an emerging epidemic of obesity, hypertension, diabetes and cardiovascular disease. In 2012, the Ministry of Health agreed to fund the National Eye Survey of Trinidad and Tobago (NESTT), to gather robust evidence to develop a National Eye Care Strategy.

Methods

- Population-based, cross-sectional study using randomised multistage cluster sampling with probability-proportionate-to-size methods
- Primary outcome measure: % blind aged ≥ 40 years
- Sample size = 4200
- Assumptions: 1.5% blindness, precision 0.5%, 20% non-participation, 1.4 design effect
- 2011 Census sampling frame, 120 clusters, compact segment sampling (Figure 1)
- 35 people aged ≥ 40 years per cluster plus 5 to 30 year olds alongside (Figure 2)
- Vision screening (LogMAR) and basic assessment at doorstep
- Comprehensive clinic for all ≥ 40 years (Figure 3)
- Independent grading of imaging data (Moorefields Reading Centre UK)
- Data collection between October 2013 and November 2014
- Ethics committee approval from Anglia Ruskin University, The University of the West Indies, and the Ministry of Health of the Republic of Trinidad and Tobago

Analysis

- Statistical analysis using STATA 13.1
- CRude prevalence adjusted for the multilevel design, weighted for cluster response rate, and adjusted using 2011 Census population stratified to municipalities, 5-year age categories and gender
- Multilevel single and multiple logistic regression analysis for a) the odds of responding versus not responding, and b) the odds of having vision < 6/18 (Moderate+Severe vision impairment+Blind) versus ≥ 6/18

Results

- n = 9898 aged ≥ 5 years enumerated
- Response rate 240 years 84.6% (95% CI 83.1 to 85.9)
- Cataract (30.1%) and diabetic retinopathy (7.9%) make a leading cause of blindness

Conclusions

- The prevalence of blindness and MMSVI in T&T in the ≥ 40 year group is lower than predicted by the Global Burden of Disease Study model for the 2010 Caribbean population (Blind ≥ 60 years of age (Blind 1.9%, 95%CI 1.4 to 2.4; MSVI 11.0%, 95% CI 7.1 to 13.9)
- Cataract (30.1%) and diabetic retinopathy (7.9%) make a greater contribution to MMSVI in T&T than expected from the GBD model. Glaucoma (28.6%) and diabetic retinopathy (11.4%) are also more important causes of blindness in T&T than expected from the GBD model
- NESTT has collected robust epidemiological data on the magnitude of blindness and vision impairment in the population ≥ 40 years for 2013-2014. Unexpected findings in the secondary outcome measures highlight the value of contemporary country-specific data over estimates of prevalence and cause predicted by a Caribbean model using older data

- In addition to ongoing efforts to reduce avoidable vision loss from uncorrected refractive error and cataract, it will be important for the Trinidad and Tobago National Eye Care Strategy to target policies and resources toward addressing avoidable blindness and vision impairment from glaucoma and diabetic retinopathy, especially in light of the rising prevalence of obesity, hypertension and diabetes in Trinidad and Tobago

Key References

4 Ministry of Health of Trinidad and Tobago. Panamerican STEPS Chronic Non-communicable disease risk factor survey Report (2012)
8 Ministry of Health of The Republic of Trinidad and Tobago: The Trinidad and Tobago National Eye Care Strategy (2013)
9 Ministries of Health of Trinidad and Tobago and Population Health, Chronic Noncommunicable disease risk factor survey Report (2012)

Table 1: Crude and prevalence adjusted of blindness (B) and moderate or severe vision impairment (MSVI)

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<thead>
<tr>
<th>Attribute</th>
<th>Prevalence</th>
<th>Adjusted Prevalence</th>
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<tr>
<td>Blind (B)</td>
<td>0.73% (95% CI 0.53 to 1.02)</td>
<td>0.34% (95% CI 0.61 to 0.04)</td>
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<td>Moderate or severe vision impairment (MSVI)</td>
<td>5.34% (95% CI 4.71 to 6.04)</td>
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Table 2: Characteristic of responders vs non-responders, and of those with normal vision vs impaired vision. Odds ratios showing significant differences between groups are highlighted in blue

Table 3: Characteristics of responders versus non-responders, and of those with normal versus impaired vision. Odds ratios showing significant differences between groups are highlighted in blue.

Figure 1: Map of Trinidad & Tobago showing location of 120 NESTT Study Clusters

Figure 2: Diagram illustrating NESTT multistage study design and response rates

Figure 3: Flow diagram illustrating participant pathway through NESTT clinic

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