Face recognition distance in the first year of life: A practical approach to visual acuity assessment for low resource countries

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Introduction

Assessment of visual function in those less than 12 months of age is important to offer the opportunity for timely and effective interventions. In low and middle-income countries (LMICs) where access to specialist paediatric services is limited but the burden of disease high there are few practical and affordable vision assessment tools. This study describes the development of a simple and low cost means to assess visual function that employs mirror facial attention distance as a surrogate measure of visual acuity.

Method

The visual acuity of a group of normal babies was previously assessed using a gold standard tool (Teller acuity cards) then immediately re-assessed using the 'mirror test'. In this test, the infant is presented close to a mirror and slowly withdrawn until attention is lost (Figure 2). The distance at which this occurred was correlated with acuity. The distance increase with age as acuity improved. In this paper a power regression model was then applied to the results to allow the creation a chart to record real world results.

Results

Data relating to 78 healthy infants were analysed and the interpolated 95th percentile values used to create a power regression model (Figure 1). A chart illustrating only the lower 95th percentile threshold was created (Figure 3). A result plotted above the line is considered 'normal' while below suggests visual impairment and retesting or referral recommended.

Conclusion

While not without its limitations this approach may prove particularly suited to use in LMICs. In these regions the need is great yet no practical low-cost vision assessment tools for this age group exists.

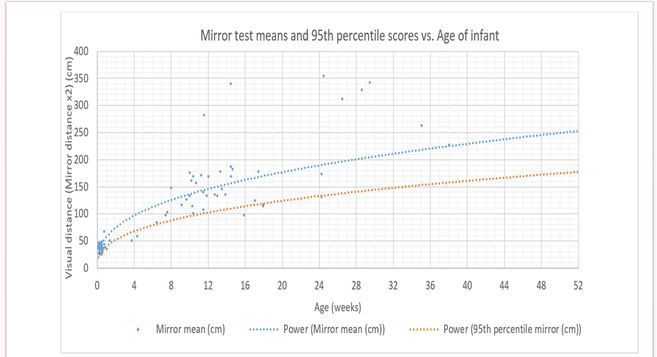


Figure 1 – Overall visual distance (distance from mirror x2) power regression model trend lines illustrating mirror test means (cm) and 95th percentile regression (Data taken from Bowman, R. et al 2010).



Figure 2– Mirror test - the distance at which the infant loses fixation is a surrogate measure of visual acuity (Bowman, R, et al 2010).

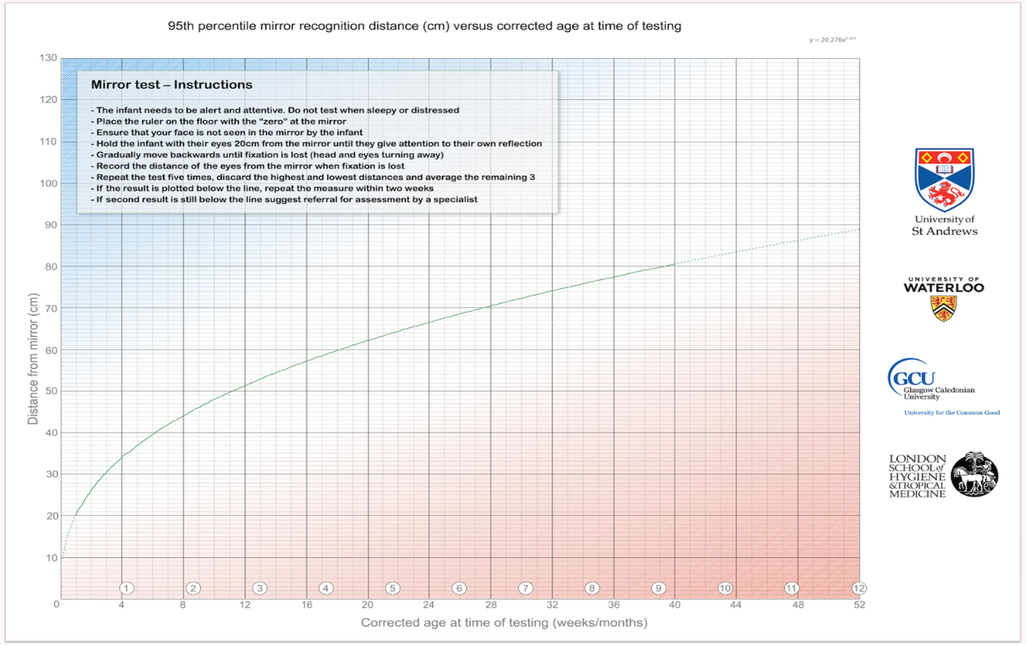


Figure 3 – 95th percentile line extracted from Figure 1 and used to construct a documentation chart

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