OCT p-RNFL thickness in children aged 0-17: a systematic review and meta-analysis

Alexandra Creavin, Cathy Williams, Nic Timpson, Ryan Langdon, Julian Higgins, Kate Tilling. University of Bristol, UK

WHAT WE KNOW

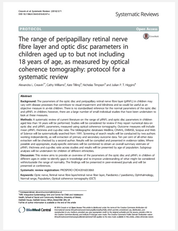
Objective measures vital in children

Hand-held OCT available for infants

pRNFL thickness correlates with damage in ocular and neurological disease

No paediatric OCT RNFL reference – so how can we use it?

WHAT WE DID


Systematic Reviews

The range of peripapillary retinal nerve fibre layer and optic disc parameters in children aged up to but not including 18 years of age, as measured by optical coherence tomography: protocol for a systematic review

Protocol published

Five databases and grey literature searched

Study authors approached where required

Screening and data extraction duplicated

WHAT WE FOUND

34 studies with data from over 11,000 children from 4 continents



RESULTS

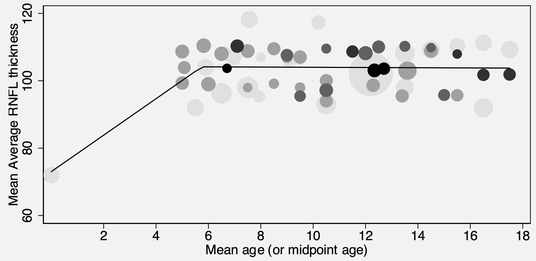
Mean quadrant thickness: Superior ≥ Inferior > Temporal ≥ Nasal

Table 4.6: Weighted mean RNFL thickness as calculated by random effects meta-analysis

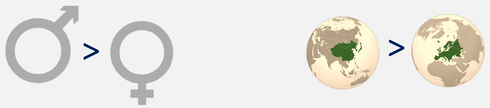
RNFL measure	n children (n studies)	Age range /yrs.	Range in RNFL (μm)	Weighted mean (95% CI) RNFL (μm)
Average	10696 (31)	0.0-17.9	72.00,118.24	103.3 (102.1,104.5)
Superior	10357 (27)	2.8-17.9	105.00,153.50	130.9 (129.3,132.6)
Nasal	10458 (26)	0.2-17.9	48.90,87.79	72.8 (71.3,74.4)
Inferior	10357 (27)	2.8-17.9	117.00,155.26	130.6 (129.2,131.9)
Temporal	10559 (26)	0.0-17.9	46.94,101.13	74.5 (72.2,76.9)

retinal nerve fibre layer (RNFL)

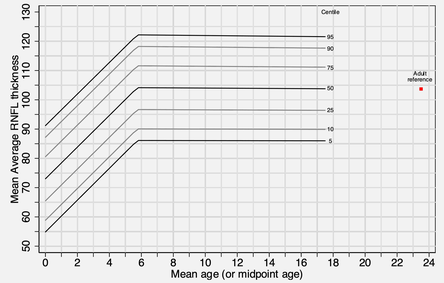
Above 6 years old, no evidence was found for an association between mean age and mean pRNFL thickness when compared to published references in adults

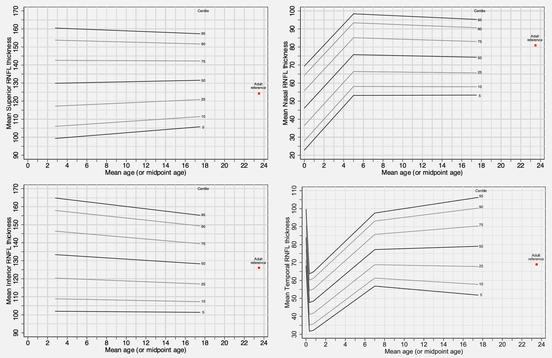


Mean pRNFL thickness across studies was thicker in East Asian study locations, in predominantly male studies, and in studies using time domain scanners.



Reference ranges derived for pRNFL thickness by age.





Clinical practice messages

Average RNFL in children older than 5 years can be examined according to adult OCT reference ranges

There is likely to be a period of "growth" or change in RNFL thickness in infancy the timing and trajectory of which is not yet understood



CONCLUSIONS

1. There is critical development of RNFL thickness before 5-7 years of age (depending on the quadrant examined)
2. > 5 years it may be possible to compare children against inbuilt existing adult databases
3. More data are needed in infants and longitudinal measures are needed to understand growth trajectories