Prevalence of amblyogenic risk factors in young Scottish children, and variations across quintiles of deprivation – implications for vision screening programmes.

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Purpose

Child vision screening in Scotland reveals an increase in myopia following COVID-19 pandemic lockdowns, but the impact on amblyopic risk factors (ARFs) has not been established. Our retrospective, longitudinal epidemiological study evaluated the change in ARFs pre- and post-lockdown in young Scottish (primarily Caucasian) children. A secondary aim was to investigate any association between deprivation and vision screening outcome.

Methods

ARF prevalence was determined for five academic years (2013-16, 2020-22) using criteria based on American Association for Pediatric Ophthalmology & Strabismus (AAPOS). ARFs included constant manifest strabismus; hyperopia (spherical equivalent refraction [SER] >+4.00D in one/both eyes); astigmatism (>1.75DC in one/both eyes); and anisometropia with interocular difference for hyperopia >1.25D SER, astigmatism >1.25DC, or mixed (one eye hyperopic, one myopic) >1.25D SER. Data were collated from Scottish national screening programme datasets following data collection by orthoptists of ~85% children aged 3.5 to 5.5y (40,000-50,000 annually). Cycloplegic refraction data from children failing screening were used to calculated ARFs prevalence. Linear regression analysed the change in ARFs across these years, with a Bonferroni correction for multiple comparisons. Odds ratios, calculated relative to those living in the third (or middle) quintile of deprivation, assessed the likelihood of referral following vision screening for children in each deprivation quintile for the most recent available data (2021/22).

Results

Across all five years the prevalence of any ARF ranged from 4.61-5.19%. There was no statistically significant change in the prevalence of any ARF, nor in the prevalence of ≥2-6 ARFs across the five years examined. In 2021/22, the odds ratios (95% confidence intervals) for referral following vision screening were 1.60 (1.48-1.72) to 0.74 (0.68-0.80), in

quintiles 1 (most deprived) and quintile 5 (least deprived) respectively. This trend was consistent across Scottish regional Health Boards.

Conclusions

The prevalence of ARFs in Scottish children did not increase after pandemic lockdowns. Children living in the most deprived quintile are 1.6 times more likely to be referred following vision screening, highlighting the importance of universal vision screening.