European Society of Ophthalmology

Name: Vasco Pinto Miranda

European Leadership Development Programme, Class of 2025-2027

Project Abstract

The Portuguese Screening Program for Amblyogenic Risk Factors – evidence-based improvement proposals

Purpose: to review the impact of this screening program (done at 2 and 4 years of age) on the number and characteristics of referrals to ophthalmology in a pre-school age group; to analyse how the program interacts with conventional referrals by family medicine physicians and pediatricians; to conceptualize, test and validate modification proposals that allow a reduction in the absolute number of referrals, and maximizes its cost-effectiveness.

Methods: a retrospective review of a 2-5 years of age cohort referred to an ophthalmology consultation (in a tertiary national health system hospital) pre and post-screening program implementation, was done. A retrospective observation study compared the rate and type of amblyopia and strabismus diagnosis, as well as optical prescriptions on those referred by the screening program and those referred by family medicine physicians (FMP) and pediatricians. Receiver Operating Characteristic (ROC) analysis was done to identify the best combinations of exams available at primary care facilities to detect each and all of these diagnosis. A cost-effectiveness analysis is underway to determine and outline evidence-based improvement proposals«

Results: the rate of referrals at 2-5 years of age has increased 9.5x between 2012 and 2024 (pre- and post-referral program implementation), but the overall referral between 0 and 18 years of age has increased much less (1.5x). Referrals by the screening program and by FMP/pediatricians had a similar rate of amblyopia (6.5% vs. 6.7%, p = 0.925). However, the type of amblyopia was markedly different, as all of the screening program amblyopias were refractive, and 2/3 of amblyopias referred by FMP/pediatricians were mixed or strabismic. A new screening model that combines plusoptix AAPOS criteria (2021) for referral with uncorrected visual acuity achieved the highest AUC (0.940) for amblyopia diagnosis out all tested models. A model that combines the Portuguese Screening Program plusoptix criteria, uncorrected visual acuity and stereopsis

measurements achieved the highest AUC (0.913) for all three diagnosis (Amblyopia and/or Strabismus and/or Optical Prescription Need). A cost-effectiveness analysis is underway.

Conclusion: The Portuguese photoscreening program and a standard clinical referral are highly complementary pathways that identify significantly different patient populations. Photoscreening is effective at detecting pre-symptomatic amblyogenic refractive errors in younger children, while clinical suspicion remains crucial for identifying strabismus. Multi-modal screening strategies and varying cut-off criteria for photorefraction may lead to a more effective, efficient and equitable screening programme. Exploring the cost-effectiveness of these multi-modal and tiered strategies can give further insights for an evidence-based improvement to the current screening model.