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Biography

Helly Patel, is an undergraduate medical student currently in All India Institute of Medical Sciences,New Delhi. She has scored an All India Rank of 31 in the undergraduate medical exam(NEET) to secure a position in the top institution.She has been working on multiple research projects in departments including gastroenterology, ophthalmology , rheumatology and public health.She has presented posters on institute's research day.She holds a special interest in the field of internal medicine and has excellent academic record too.

Bridging the Screening Gap:Training and Assessing the medical undergraduate workforce for Diabetic retinopathy screening

Abstract:

Purpose: Diabetic retinopathy (DR) is a leading cause of preventable blindness worldwide, creating a growing demand for scalable screening strategies. This study evaluated whether medical undergraduates, after a brief targeted training session, could accurately identify referable DR on fundus images and potentially serve as frontline screeners to reduce the burden on ophthalmologists.

Methods: In this prospective study, 51 medical undergraduates received a 2-hour training session conducted by a retina specialist. Participants independently graded 132 standardized, de-identified fundus images with six-point severity scale (0: No DR, 1:Mild DR, 2:Moderate DR, 3:Severe DR, 4:Proliferative DR, 5:Other Pathology). Statistical analysis was performed in R studio. Performance was measured against a retina specialist's "gold/reference standard" using individual and pooled ROC analyses, sensitivity/specificity for referable disease (grade ≥2), and Kappa score.

Results: In the referrable vs non-referrable task, the student cohort achieved a mean sensitivity of 95.90% (95% CI: [95.0%-96.7%]) and a mean specificity of 75.60% (95% CI: [71.5%-79.6%]). The overall average Kappa agreeability score was 0.6446 (95% CI: [0.6126-0.6766]).

The mean individual AUC was 0.8±0.103(95% CI: [0.783-0.839]). The pooled ROC analysis of the aggregated data(N=6,732 observations) yielded an AUC of 0.806±0.0074(95% CI:[0.7915-0.8206]).

Conclusions: A brief targeted training session enabled medical undergraduates to identify referable DR with high sensitivity (fulfilling screening tool requirement) and consistent diagnostic performance. The kappa value falls into the Substantial Agreement range. The minimal difference between individual and pooled AUC values suggests strong inter-observer reliability. Integrating trained medical students(who in future will serve in different specialties) as frontline screeners may represent a scalable strategy to improve DR detection and reduce the screening burden on retina specialists especially in resource limited settings.