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ARTICLE



Smartphone-based application improves the detection of retinoblastoma

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Abstract

Purpose To improve and validate the smartphone-based leukocoria detection application so that non-ophthalmologists could make use of the smartphone for early detection of Retinoblastoma (RB) in young children without anesthesia and pharmacological dilatation of the pupil.

Methods Two apps, MDEyeCare and CRADLE, developed for red reflex based leukocoria detection were used in iPhone 6s. MDEyeCare methodology was modified with respect to ambient lighting, the distance between camera and eye and different gazes for better performance. We analyzed totally 34 eyes of 23 RB patients and four normal children. Each of the RB patients was confirmed with clinical examination and radiological investigations.

Results Modification in the methodology of MDEyeCare app could detect the leukocoria in early stages of RB (50% of Group B, 83% of Group C). In late stages (Group D and E), 100% of tumors were detected. The CRADLE app failed to provide adequate leukocoria detection except four late stage RB eyes. Among the 14 normal eyes (6 from unilateral RB and eight from normal children), pseudo-leukocoria was observed in three eyes only at lateral gaze even with MDEyeCare app.

Conclusion Improved methodology in smartphone-based app enhanced the detection of RB and this may translate into better outcome after treatment with respect to vision salvage.