3rd Global

Pediatric Ophthalmology Congress

March 22-23, 2018 | London, UK

Algorithm of improving image quality, diagnosis and morphometry at retinopathy of prematurity

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Objective: 100000 premature infants are born per year, 70% of them are at risk, and 37% cases is developed retinopathy of prematurity (ROP) in Russian Federation. All of them are examined in 98 perinatal centers and ophthalmological medical institutions.

Materials & Methods: 272 Infants examined in the Department of Ophthalmology at the VSMU aged 37 to 62 post-conceptual weeks, with a birthweight 500 g to 2980 g. The new algorithm includes RetCam Shuttle video, the choosing the best pix, modeling wide-field image, which allows to check the "mute" zones, the place of the macula and the index of traction, the zone and extension, the measurement of the number of bifurcations and fractal analysis of the tree in the retina, complexity of vascular systems from stage A (preliminary capillary plexus), B (normal vascularization) to C (pathological vasculogenesis).

Results & Discussion: The incidence of ROP was I stage 55.9%, II stage 16.5%, III stage 3%, plus-disease 2.6%, immaturity of the retina 22%. The worst screening quality was at the lower temporal zone in 65%. I zone is visualized fully, II zone is visible partially, III zone is not available for screening. The traction index value was 1.3 at I stage, 1.46 at II stage, 1.77 at III stage. The significant changes mostly were identified 90% 2:45-3:15 in II zone. Fractal dimension increases from 1.4 in I stage with extension 2-3 hours to 1.67 in plus-decease and 1.78 1800 in III stage.

Conclusion: Developed algorithm allows to obtain new ROP screening and treatment control criteria.

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Journal of Clinical & Experimental Ophthalmology
ISSN: 2155-9570

Pediatric Ophthalmology 2018
March 22-23, 2018

Volume 9

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