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Editorial

RetCam vs. Binocular Indirect Ophthalmoscopy for ROP Screening

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Retinopathy of prematurity (ROP) is the leading blindness in children in developed countries [1,2], and it is considered a vasoproliferative disease that affects pre maturely born infants. According to different countries, there are different protocols for screening regarding: the birth, the weight, and the weeks of gestation. For example: the screening criteria in the United Kingdom include all infants with 1500g of weight and born at or before 32 weeks' gestation, in south America the protocol is different, we include babies with 1750g and 35 weeks' gestation. Binocular indirect ophthalmoscopy is considered the standard method for screening preterm infants for ROP, however there are limitations: 1.- exclusive use by a ROP specialist, 2.- it has been suggested that extended examinations in neonates undergoing ROP screening are not well tolerated [3,4]. 3.- The screening for ROP is painful and is related with significantly higher stress response than digital fundus camera. 4.- Several factors may be implicated in the differential effects of the RetCam and binocular indirect ophthalmoscopy such as; scleral rotation necessary, the level illumination [5]. Mukherjee., *et al*. found that heart rate and respiratory rate was significantly higher in the indirect ophthalmoscopy group than in the digital fundus camera group.

During the last decade the use of telemedicine has become an effective alternative screening device. The RetCam, a digital fiberoptic wide-angle fundus camera with a 130-degree view is one type of camera commonly used for ROP screening. In 2008 Photo Rop cooperative group study included Infants < 31 weeks' gestational age and < 1000g at birth and they found 92% of sensitivity by using digital images for clinically significant ROP. Despite of that they considered it is unlikely to supplant beside opththalmoscopy examination due to some limitations in diagnostic sensitivity, specificity, and accuracy. In October 2013 a multicenter clinical trial sponsored by the National Eye Institute, e-ROP, enrolled 1,257 babies from 12 neonatal intensive care units (NICUs) in the United States and Canada. It was the first ROP study to use trained non physician readers. They identified morphology consistent with referral- warranted ROP: zone I ROP, stage 3 or worse ROP and/or plus disease, in the same study doctors performed binocular indirect ophthalmoscopy evaluation at the same session as images are taken and then compared. The result provided strong support for the validity of remote evaluation by trained non physician readers of digital retinal images taken by trained non physician imagers from infants at risk for referral-warranted ROP.

The SUNDROP one of the longest-running telemedicine programs (the Stanford University Net-work for diagnosis of Retinopathy of Prematury), at six years of screening for ROP with telemedicine compared with bedside binocular opththalmoscopy, remote interpretation of RetCam II/III images had sensitivity of 100%, specificity of 99.8%, positive predicative value of 95.5% and negative predicative value of 100% for detection of treatment-warranted ROP.

The use of RetCam definitely will not replace the BIO, and the main reason is because clinical examination, diagnosis, follow-up, and treatment must be done by the ROP specialist and not by the machine. RetCam is a helpful tool for telemedicine and screening mostly in zone I or zone II ROP due to limitations in capturing zone III by the camera. In 2006 in Academy survey only about half of retina specialists and pediatric ophthalmologists were willing to do ROP screening. Unfortunately, things have not change over the last ten years. One of the goals is to create protocols using both, BIO and RetCam in places where physicians who may examine the babies include: general ophthalmologist, pediatric ophthalmologist, and retina specialist and use only telemedicine in remote rural areas. for example: in devel-

oping countries, telemedicine has become in a useful alternative and the reasons are many, generally in South America, there are a lot of rural areas where NICUS do not have ROP specialist or at least trained non physician readers of digital retinal. Curiously, in those areas management of oxygen in premature infants along with others risk factors like the weight and gestational age are the causes that aggressive posterior (AP-ROP) in zone I and zone II are seems very often and clinically these kind of situation carry rapidly to stage 5 of ROP, therefore the use of telemedicine with retCam must be applied with previous trained doctors or non physician readers, and the images would be sent to a pilot hospital.

To summarize, the use of retCam, offers many benefits: telemedicine, it is easier for the babies than BIO, the cost-benefit. It is more expensive for governments to keep blind people for about 75 to 80 years than to pay around $ 100,000, for RetCam once, retCam allows education during residency and fellowship programs, it is good tool for documentation, and for research, and it may help educate parents about the disease [6-8].

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