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Alternative strategy for screening or screening of Retinopathy of the Premature through a wide field digital image. Pilot project (<https://blog Oftalmólogo a Día Com/estrategia-alternativa-para-tamizaje-o-screening-de-retinopatía-del-prematuro-mediante-imagen-digital-de-campo-amplio.-proyecto-piloto>)

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Introduction

Retinopathy of prematurity (ROP) is a disease that affects the vascularity of the immature postnatal retina in the eyes of premature infants. Thanks to medical and technological advances and better neonatal care in nurseries, the survival of low birth weight children has increased considerably worldwide, thus increasing the incidence of this disease.

Retinopathy of prematurity can be mild or severe enough to cause significant damage to the retina or tractional detachment of the retina and lead to irreversible bilateral blindness. This entity is one of the few causes of childhood blindness that may be preventable if it is detected and treated in a timely manner. ¹

ROP was described by Terry in 1942 with the term "retrolental fibroplasia". Although this entity was rare, it gradually increased its frequency to become the first cause of blindness in children in the United States, this was attributed to the indiscriminate use of oxygen in the nursery, which today we know is a risk factor for the development of this entity. ²

Currently, we know that the determining factors to develop this entity are low birth weight and prematurity. There are other factors that may also be involved in the development of this entity such as: sepsis, hypercapnia, hypoxemia, apnea, oxygen in high doses, hyperglycemia, transfusions, among others.

Worldwide, the incidence of ROP is variable and depends on the quality of neonatal care, access to timely detection programs, trained personnel for its detection and treatment. In highly developed countries the incidence is lower and occurs in babies of lower weight or with concomitant systemic alterations, it is believed that two thirds of the 50,000 children with ROP blindness worldwide live in Latin America. ³



Foto 1. Tamizaje ROP utilizando cámara 3nethra neo® (FORUS HEALTH).

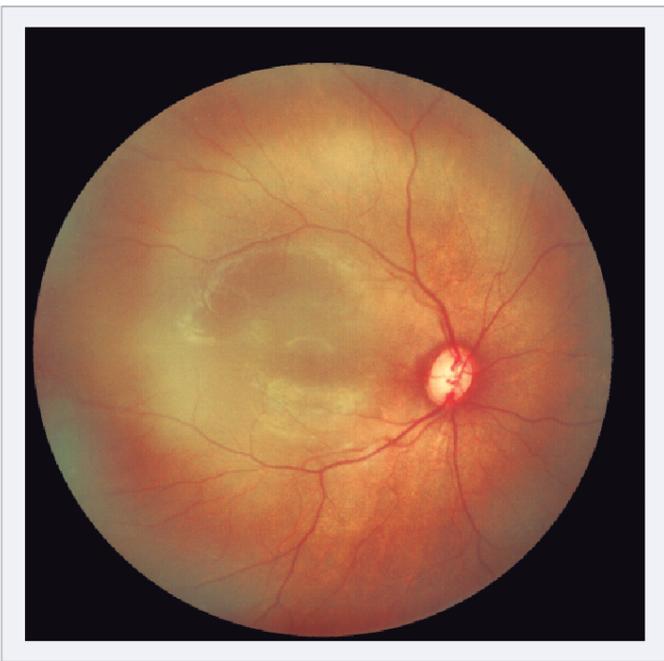


Foto 2. Fondo de ojo recién nacido pretérmino sin patología.



Foto 3. ROP Estadio 2 en Zona II.

Usually the examination in most nurseries is performed under indirect ophthalmoscopy, pupillary dilation and scleral depression. This can be complicated especially for developing countries because it is necessary trained ophthalmologists, nurses and neonatologists at all times. An alternative method is the taking of digital images by means of wide field cameras, in this way it is possible to obtain very good quality photos for diagnosis, monitoring and telemedicine. ⁵

The purpose of this study is to evaluate the use of a portable 3nethra neo® wide field camera (FORUS HEALTH), through a telemedicine program as a pilot test.



Materials and methods

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Retinopathy of the Premature (ROP) study on (http://Creative%20Learn%20Media) of reading background photographs of 92 eyes corresponding to 46 pediatric patients over a period of 60 days that were acquired with the 3nethra neo® camera (FORUS HEALTH).

Study population

Premature babies were included from the Mexican Social Security Institute in the City of Querétaro who were in the neonatal care unit (NICU) with criteria or associated risk factors that justified screening.

Photo shooting

An explanation of the procedure was made to the parents or caregivers of the newborn and the obtaining of informed consent. The screening was carried out by ophthalmologists, retinologists from the Mexican Institute of Ophthalmology who went to the NICU for screening with all the guidelines of the nursery and in the presence of the neonatologist and nursing staff. Patients who attended the IMO were evaluated in the presence of their parents or guardians. The pupil was dilated pharmacologically in all cases with a dilution of tropicamide + phenylephrine (ophthalmological solution 50 mg / 8 mg / ml) at 50% (with artificial tears) after applying a drop of tetracaine hydrochloride 5mg / ml ophthalmological solution. The screening was performed without sedation, under topical anesthetic, Photographs of 7 fields were obtained with the 3nethra neo® camera (FORUS HEALTH).

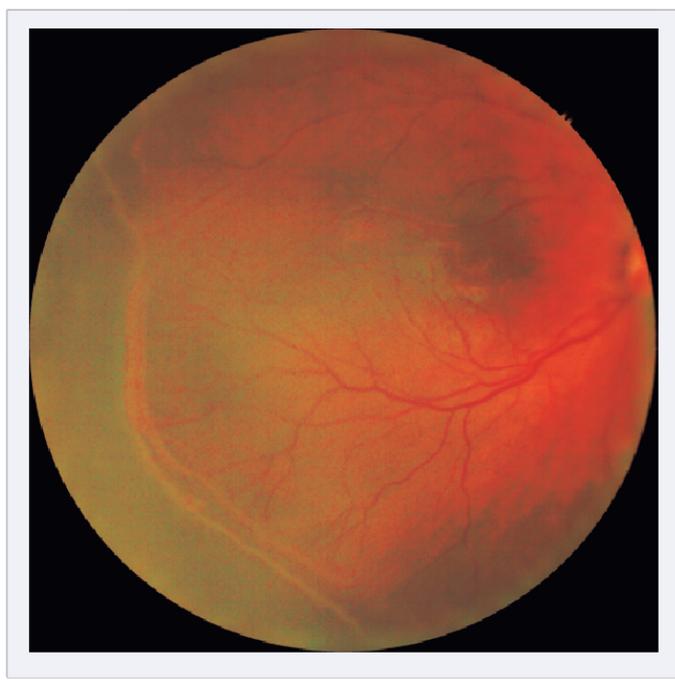


Foto 4. ROP Estadio 2 zona II, doble cresta.



Foto 5. Enfermedad plus.

Data transfer

The data and images were sent via Internet to the MAILOR reading center (Mexican Advanced Imaging Laboratory for Ocular Research) located in the Mexican Institute of Ophthalmology IAP, where they were qualified by a retinologist expert in retinopathy of prematurity taking into account the Interna 

Descriptive statistics were used to report the clinical and demographic characteristics of the study population.

Results

Fundus photographs were acquired with the 3nethra neo® (FORUS HEALTH) camera of 92 eyes corresponding to 46 pediatric patients in a period of 60 days. The 65.21% (n = 30) of the population was male, the average gestational age at birth was 31.6 weeks (SD = 2.4), the average post-menstrual age at the time of assessment was 36.4 weeks (SD = 3.2) and the average weight at birth was 1436.6 gr (SD = 386.2).

The 21.73% of the patients who were screened had some degree of retinopathy of prematurity. Of the 92 eyes of which wide field photographs were obtained, 14.1% presented corresponding findings with retinopathy of prematurity stage 1, 2.2% stage 2, 1.1% stage 3, 2.2% stage 4A and 1.1% stage 4B, no cases of stage 5 were diagnosed. 6.5% of the eyes evaluated (n = 6) presented findings of disease plus, of these 1 eye presented stage 4A, 1 eye stage 3, 1 eye stage 2 and 3 eyes stage 1 of the illness. The 13.04% of the eyes (n = 12) presented a complete vascularization of the retina (mature retina).

Discussion

The 8.7% of our screened babies required treatment according to the evaluation of the reading center, the 3nethra neo® camera (FORUS HEALTH), allows a visualization of 120 degrees of fundus, is light 720 grams and easy to transport, as well as easy to use by staff with minimal training. The photos obtained allow the reader to interpret and issue a therapeutic recommendation, although this study is pilot and it is necessary to compare the sensitivity and specificity of taking photos and compare it with indirect ophthalmoscopy (gold standard test), it is a useful tool, not as expensive as the use of large fixed machines with trained personnel, they can be read immediately by an expert and issue a recommendation for treatment.

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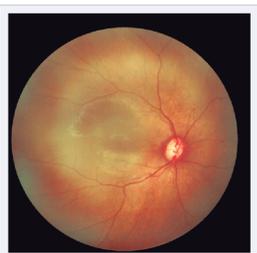


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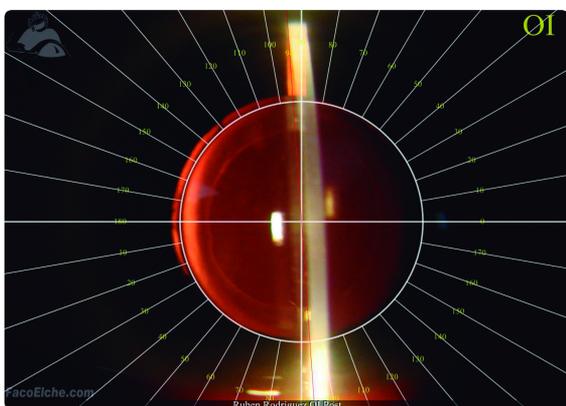
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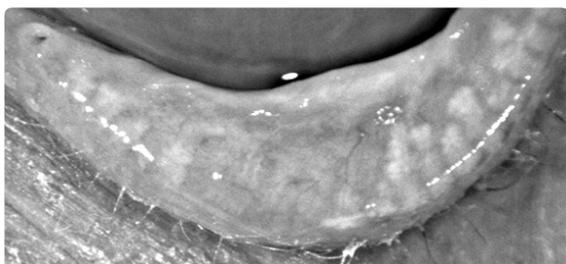
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