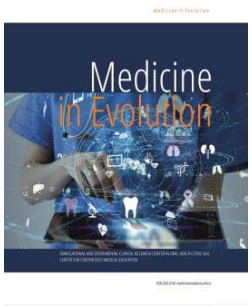
Premature infants with premature retinopathy in timisoara. Prevention and therapeutic conduct in Bega maternity



Ilyes S.[1], Neamțu R.I.[2], Dahma G.[2], Erimescu A.G.[2], Bernad E.S.[2], Silaghi C.-I.[2], Craina M.L.[2]

[1]"Victor Babeş" University of Medicine and Pharmacy Timişoara, Romania
[2]Department of Obstetrics and Gynecology, "Victor Babeş" University of Medicine and Pharmacy Timişoara, Romania)

Correspondence to:
Name: Radu Ionuț Neamțu
Address: Department of Obstetrics and Gynecology "Victor Babeş" University of Medicine and Pharmacy, 2 Eftimie Murgu Square, 300041 Timişoara, Romania
Phone: +40 729 098 886
E-mail address: neamturaduionut@gmail.com

Abstract

Premature retinopathy (ROP) is a vasoproliferative disease secondary to inadequate vascularization of the immature retina of premature infants, which can lead to blindness or severe visual sequelae. It is one of the leading causes of preventable child blindness, with about 2/3 of the 50,000 blind children worldwide living in Latin America. The proportion of blindness caused by ROP is greatly influenced by the level of neonatal care (availability, human resources, equipment, access and quality of care), as well as the existence of screening and treatment programs. Therefore, there is great variability in the occurrence of the disease in developed and developing countries [1-3]

Keywords: prematurity retinopathy, premature infants, intraventricular hemorrhage

INTRODUCTION

The International ROP Classification defined the disease according to its severity (stages 1-5), location (zones I-II-III) and duration in hours (1-12 hours), with or without "plus" disease (arteriolar dilation and venous tortuosity). This classification would be an indicator of disease activity. Furthermore, an update to this assessment was recently published.

(ICROP-revisited), being recognized as a more severe form that is affecting the posterior pole (zone I and II), known as threshold disease (4-6 (D)).

ICROP defined threshold disease by the presence of stage 3 ROP, located in areas I or II with an extension of at least 5 continuous hours or 8 hours interspersed and with the identification of arteriolar and venous dilatation known as "plus" disease.

The clinical significance of the threshold disease is that if the premature baby is not treated in time he will have the chance to develop complications and anatomical and functional results in 50% of cases.

The treatment of threshold disease is associated with a 41% reduction in the occurrence of traction retinal folds or retinal detachment and a 19% to 24% reduction in the incidence of blindness when assessed over the next five to 15 years. [7-9] However, despite the availability of treatment and its undeniable benefit, more than 40% of children remain with visual acuity (AV) <20/200 in the treated eye.

Neonatal units for intensive care of premature infants have recognized the need for a specialized ophthalmologist to screen high-risk children. We must keep in mind that not every ophthalmologist has experience in examining or treating premature infants. Even among ophthalmologists, ROP is a very specific domain and few gain enough knowledge and experience for effective eye assessment, treatment indication and disease follow-up. As a general rule, intensive care units must be prepared to provide them with adequate conditions, coordination, training and correct treatment or timely transfer.

1. When is the first eye examination performed on the premature newborn? Which are are the criteria for indicating subsequent examinations?

In general terms, the objective of ocular evaluation of the premature newborn adequately detects the largest possible number of cases with indications for treatment, and simultaneously minimizes the number of unnecessary tests. [11,12]

Developing of the evaluation scheme and treatment of prematurity retinopathy:

- the younger the gestational age (GA), the more likely it is that the ophthalmoscopic signs of ROP will appear;
- Ophthalmological signs of the acute stages of the disease usually begin between week 32 and 44; the disease occurs very rarely before week 31, and stage 3 usually occurs between the 34th and 42nd week;
- when the retinal signs start after the 36th week, they rarely evolve towards severe ROP [13,14, 15-18]

Considering gestational age, children born earlier develop the disease earlier than those born closer to term [13,14 12].

In any case, in countries with a high rate of development, the characteristics of premature babies who develop severe forms of ROP differ from those affected in less developed countries, indicating the interaction of neonatal care, survival rate and variations in forms of assessment and ophthalmological follow-up. [2]

Taking into account GA and chronological age (IC), it is recommended that the first examination to be performed between the 31st and 33rd week of GA or between the 4th and 6th week of life [10,19,20].

Subsequent scheduled examinations should be determined by the results of the first examination. If the vascularization is already complete (mature retina), follow-up should be

after six months for the assessment of functional visual development, strabismus, nystagmus or ametropia; Premature babies have a 46% chance of developing some of these eye changes [21].

When vascularization is incomplete (immature retina) or shows any signs of pre-threshold ROP, the evaluation should be every two weeks until complete regression of the signs.

In the immature retina with ophthalmoscopical signs covering area I, examinations should be weekly.

Aim and objectives

The aim of this study was to assess how many premature newborns had ophtalmological (premature retinopathy) and neurological complications (intraventricular hemorrhage) and what was our therapeutic conduct regarding these complications.

MATERIAL AND METHODS

This study is a retrospective study carried out between 2016-2018 and includes 74 newborn patients. From this 74 newborns, only 24 benefited from an ophthalmological consultation. (Figure 1)

Also, from those 24 patients who benefited from the consultation, 10 were diagnosed with ROP. (Figure 2)

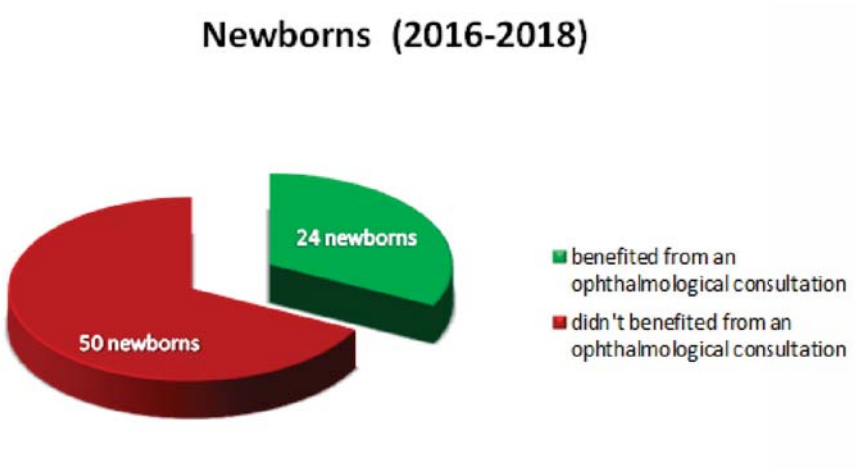


Figure 1. Premature newborns between 2016-2018

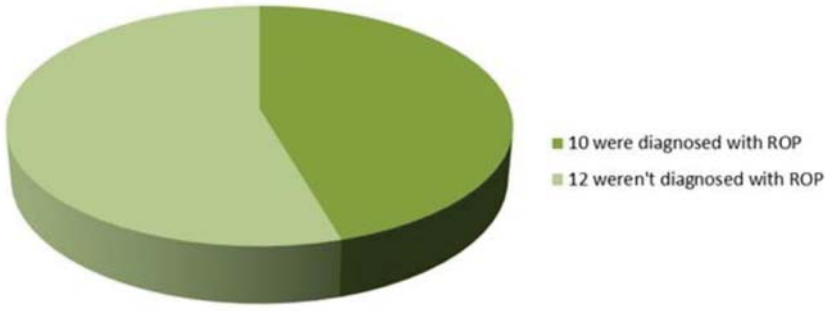


Figure 2. Premature newborns diagnosed with ROP after ophtalmological consultation

RESULTS

From the 74 newborns, this time 73 benefited from a transfontanellar ultrasound. (Figure 3)

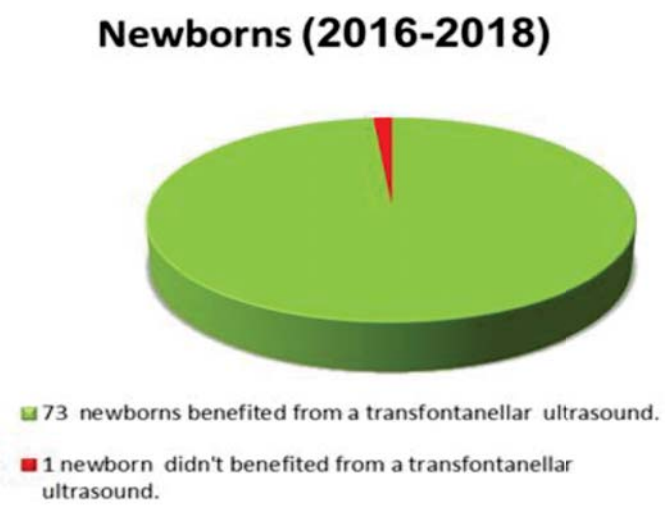


Figure 3. Premature newborns that benefited from a transfontanellar ultrasound

From the 73 newborns who received transfontanellar ultrasound, 65 were diagnosed with intraventricular hemorrhage. (Figure 4.)

From this 65 newborns with intraventricular hemorrhage, 29 were diagnosed with grade I intraventricular hemorrhage, 18 with grade II intraventricular hemorrhage, 7 with grade III intraventricular hemorrhage, 4 with grade IV intraventricular hemorrhage and 7 with subependymal hemorrhage. (Figure 5.)

Also, from the 73 newborns who received transfontanellar ultrasound,56 were diagnosed with EHIP (Figure 6.) as follows : 3 were diagnosed with EHIP mild form, 28 with EHIP moderate form and 25 with EHIP severe form. (Figure 7.)

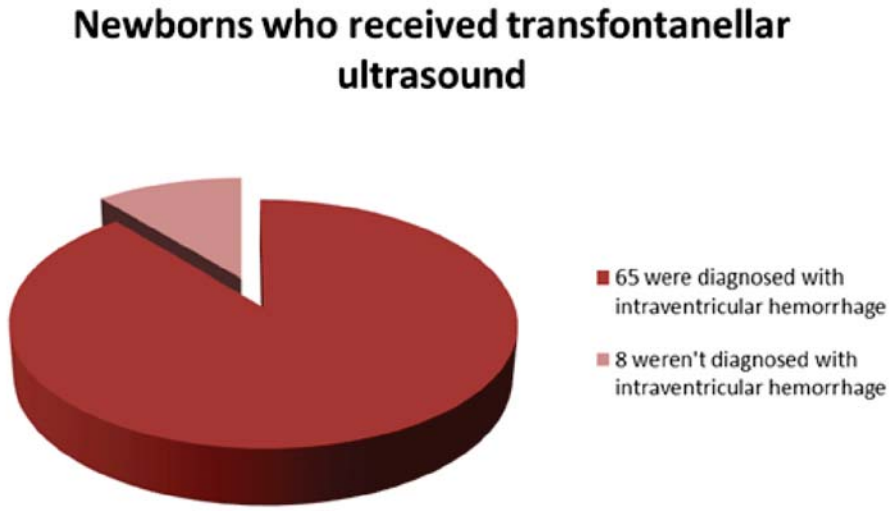


Figure 4. Premature newborn diagnosed with intraventricular hemorrhage

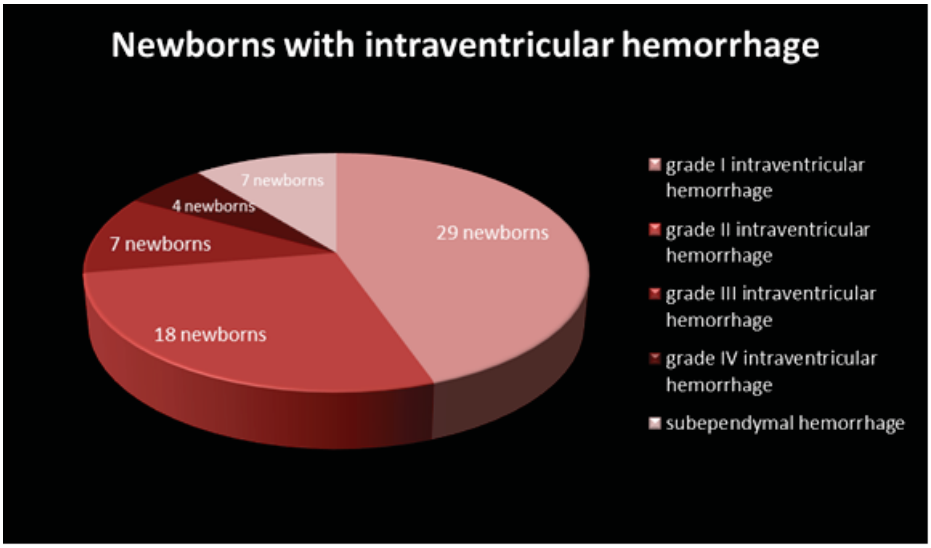


Figure 5. Grades of intraventricular hemorrhage diagnosed in premature newborns

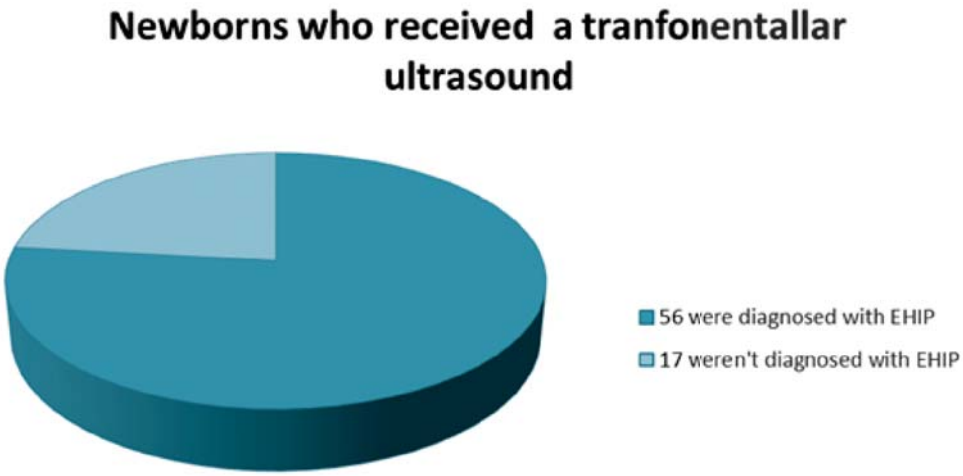


Figure 6. Premature newborns diagnosed with hypoxic-ischemic encephalopathy

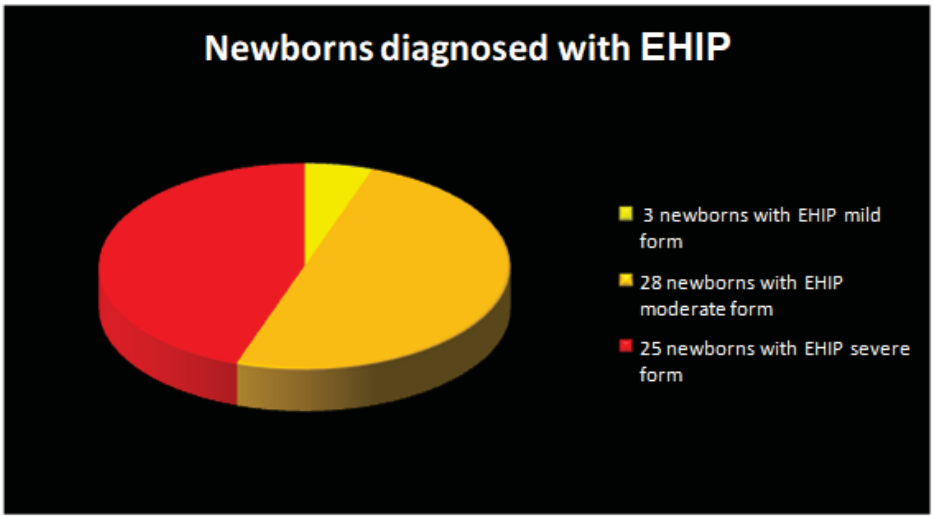


Figure 7. Premature newborns diagnosed with hypoxic-ischemic encephalopathy

Also from the 74 newborns initially studied, 4 were diagnosed with hydrocephalus. (Figure 8)

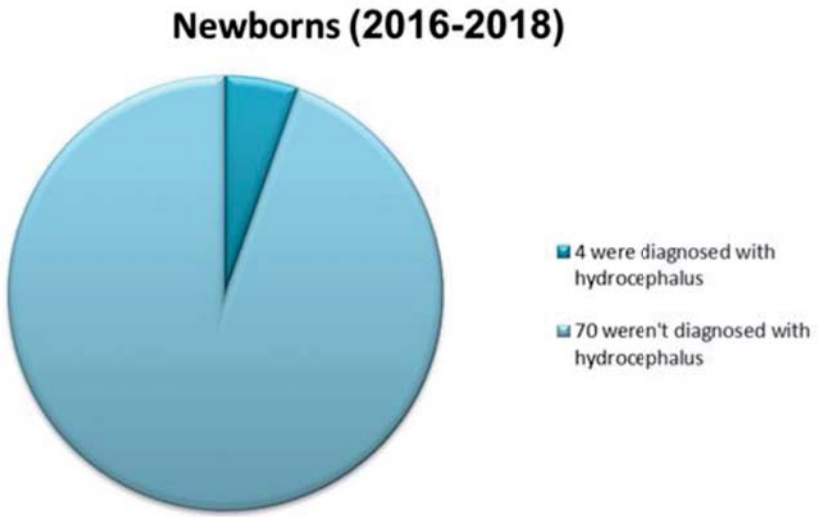


Figure 8. Premature newborns diagnosed with hydrocephalus

DISCUSSIONS

There are many complications when it comes to premature newborns, but the most important ones, that we studied are premature retinopathy, intraventricular hemorrhage and hypoxic-ischemic encephalopathy. As our study show, these complications are relatively frequent and require special attention. The most important thing that a neonatologist has to do in order to diagnose these complications is to perform screening investigations such as transfontanellar ultrasound and ophtalmological investigations. Another important aspect is that after diagnosing the complication, the neonatologist has to perform further investigations in order to follow up the progression of the complications mentioned above. As shown in our study, most of the preterm newborns were diagnosed with intravetricular hemorrhage and hypoxic-ischemic encephalopathy. Few of them were diagnosed with premature retinopathy.

CONCLUSIONS

The initial eye examination should be performed between the 31st and 33rd week of gestational age or between the 4th and 6th week of life. Indication of subsequent examinations should be established depending on the findings of the first examination.

Perinatal hypoxia continues to be a concern for perinatologists and priests and an occupation for too many lawyers, given its possible role in the occurrence of cerebral palsy.

ASPHIXIA is the most frequent acute aggression in the perinatal period, simultaneously with the antecedent of hypoxemia-ischemia, with the characteristic that, in addition to their biochemical changes, HYPERCAPNIA is added, with adequate circulatory effects.

REFERENCES

1. Gilbert C, Rahi J, Eckstein M, O'Sullivan J, Foster A. Retinopathy of prematurity in middle-income countries. Lancet 1997; 350:12-4.

2. Gilbert C, Fielder A, Gordillo L, Quinn G, Semiglia R, Visintin P, et al. Characteristics of infants with severe retinopathy of prematurity in countries with low, moderate, and high levels of development: implications for screening programs. Pediatrics 2005; 115:518-25.
3. Darlow BA, Hutchinson JL, Simpson JM, Henderson-Smart DJ, Donoghue DA, Evans NJ. Variation in rates of severe retinopathy of prematurity among neonatal intensive care units in the Australian and New Zealand Neonatal Network. Br J Ophthalmol 2005;89: 1592-6.
4. An international classification of retinopathy of prematurity. Prepared by and International Committee. Br J Ophthalmol 1984; 68:690-7.
5. An international classification of retinopathy of prematurity. II. The classification of retinal detachment. The International Committee for the Classification of the Late Stages of Retinopathy of Prematurity. Arch Ophthalmol 1987; 105:906-12.
6. The International Classification of Retinopathy of Prematurity revisited. International Committee for the Classification of Retinopathy of Prematurity. Arch Ophthalmol 2005; 123:991-9.
7. Multicenter trial of cryotherapy for retinopathy of prematurity. 3 1/2-year outcome - structure and function. Cryotherapy for Retinopathy of Prematurity Cooperative Group. Arch Ophthalmol 1993; 111:339-44.7.
8. Multicenter trial of cryotherapy for retinopathy of prematurity. Snellen visual acuity and structural outcome at 5 1/2 years after randomization. Cryotherapy for Retinopathy of Prematurity Cooperative Group. Arch Ophthalmol 1996; 114:417-24.
9. Palmer EA, Hardy RJ, Dobson V, Phelps DL, Quinn GE, Summers CG, et al. Cryotherapy for Retinopathy of Prematurity Cooperative Group. 15-year outcomes following threshold retinopathy of prematurity: final results from the multicenter trial of cryotherapy for retinopathy of prematurity. Arch Ophthalmol 2005; 123:311-8.
10. Multicenter trial of cryotherapy for retinopathy of prematurity. Preliminary results. Cryotherapy for Retinopathy of Prematurity Cooperative Group. Arch Ophthalmol 1988; 106:471-9.
11. Hutchinson AK, Saunders RA, O'Neil JW, Lovering A, Wilson ME. Timing of initial screening examinations for retinopathy of prematurity. Arch Ophthalmol 1998; 116:608-12.
12. Chen HJ, Teng RJ, Tsou Yau KI, Yang CM. Optimal timing of retina examinations for premature infants. J Formos Med Assoc 1998; 97:552-6
13. Holmström G, el Azazi M, Jacobson L, Lennerstrand G. A population based, prospective study of the development of ROP in prematurely born children in the Stockholm area of Sweden. Br J Ophthalmol 1993; 77:417-23.
14. Fielder AR, Shaw DE, Robinson J, Ng YK. Natural history of retinopathy of prematurity: a prospective study. Eye (Lond). 1992; 6:233-42.
15. Section on Ophthalmology American Academy of Pediatrics; American Academy of Ophthalmology; American Association for Pediatric Ophthalmology and Strabismus. Screening examination of premature infants for retinopathy of prematurity. Pediatrics 2006; 117: 572-6.
16. Retinopathy of prematurity: guidelines for screening and treatment. The report of a Joint Working Party of The Royal College of Ophthalmologists and the British Association of Perinatal Medicine. Early Hum Dev 1996; 46:239-58.
17. Guidelines for screening examinations for retinopathy of prematurity. Canadian Association of Pediatric Ophthalmologists Ad Hoc Committee on Standards of Screening Examination for Retinopathy of Prematurity. Can J Ophthalmol 2000; 35:251-2.
18. Grupo Retinopatia da Prematuridade Brasil. Relatório do I Workshop Retinopatia da Prematuridade. Arq Bras Oftalmol 2007; 70:875-83
19. Quinn GE, Johnson L, Abbasi S. Onset of retinopathy of prematurity as related to postnatal and postconceptional age. Br J Ophthalmol 1992; 76:284-8.
20. Reynolds JD, Dobson V, Quinn GE, Fielder AR, Palmer EA, Saunders RA, et al. Evidence-based screening criteria for retinopathy of prematurity: natural history data from the CRYO-ROP and LIGHT-ROP studies. Arch Ophthalmol 2002; 120:1470-6.
21. Schalij-Delfos NE, de Graaf ME, Treffers WF, Engel J, Cats BP. Long term follow up of premature infants: detection of strabismus, amblyopia, and refractive errors. Br J Ophthalmol 2000;84: 963-7