

**UNIVERSITY OF MEDICINE AND PHARMACY TG.MURES
SCHOOL OF DOCTORAL STUDIES**

Early and late structural and functional aspects in retinopathy of prematurity

PhD Thesis

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Abstract

Retinopathy of prematurity (ROP) is a vascular disease of the retina, due to altered vasculogenesis, which affects premature infants with low birth weight. Severity can range from mild forms which don't interfere with visual function, to serious forms which can lead to the development of retinal detachment and even blindness.

Present paper is structured in two parts: the first part is theoretical and the second part consists of personal research.

The theoretical part of this thesis presents data from the literature regarding the retinopathy of prematurity and modern methods of diagnosis and treatment of this disorder.

The personal research includes two studies, both prospective interventional. The first study is about the screening and the treatment of retinopathy of prematurity in Tg-Mures Ophthalmological Clinic and Neonatal Unit I.

In this study we aimed at analyzing the effectiveness of screening and treatment methods in our center and to record epidemiological aspects related to ROP disease.

The second study aims at evaluating the structural and functional changes in premature infants at risk for retinopathy of prematurity, who were followed for a period of 3 years.

The first study is a prospective interventional type, and is mainly aimed at assessing the incidence of ROP, stages of disease, and severe forms which requires treatment in a group of premature infants considered at risk for retinopathy of prematurity, born or transferred to the Neonatal Unit I of Tg.Mures. Secondary objectives were: evaluation of maternal and fetal risk factors for retinopathy of prematurity, laser treatment outcomes, respectively structural eye changes in the preterm group.

Material and Method: The study sample consisted of 537 preterm babies with gestational age (GA) ≤ 34 weeks, birth weight (BW) ≤ 2000 grams, which attended all requested ophthalmological exams.

Study methods: Premature babies included in the study underwent ophthalmological examination which consisted of anterior pole ocular examination and fundus examination by indirect ophthalmoscopy. Laser treatment was applied to all premature infants with threshold ROP stage, within 72 hours after diagnosis.

Method of data collection:

Our data were transversely gathered, first examination being performed at 4-7 weeks after birth, subsequent examinations were in a range between 2-3 days and one month, depending on the eye fundus appearance.

Results: Our results have shown the effectiveness of screening and treatment of ROP in Tg.Mures, being comparable to those reported from countries with a high level of neonatal care.

Conclusions: Although in our study only a single premature who received laser treatment had a birth weight over 1500 grams, this justifies criteria screening adopted by us,

performed in all premature infants with less than 34 weeks GA and less than 2000 grams BW.

The second study, also prospective interventional type had as main objective assessment of refractive status, of strabismus and structural changes in premature infants at risk for retinopathy of prematurity, and the secondary endpoints regarded certain correlations between retinopathy of prematurity and structural and functional eye aspects.

Material and Method: We studied a group of 106 premature infants, who were part of the 537 preterm evaluated in our first study, and who were present at the ophthalmological exams at the age of 1 year, respectively 3 years.

Study methods: Strabismus evaluation was performed by using cover test and by measuring the angle of deviation at sinoptofor. Refractive status evaluation was performed by retinoscopy (skiascopie) and autokeratorefractometrie, and structural changes were evaluated by slit lamp examination of the anterior pole and through indirect ophthalmoscopy.

Method of data collection:

Our data were transversely recorded; children examination was performed at scheduled intervals from 6 to 6 months, and at 1 year respectively at 3 years of age we assessed the refractive status, structural changes and ocular motility disorders.

Our **results** were largely consistent with those reported by other research from Romania and abroad. Retinopathy of prematurity was particularly involved in the development of strabismus, while laser treatment was frequently correlated with the appearance of myopia and astigmatism in these children.

Conclusions:

Since retinopathy of prematurity is a condition that can interfere with visual function, long term follow-up for at least 3 years is mandatory for preterm babies predisposed to this disease.

Keywords: ocular structural changes, retinopathy of prematurity, ROP screening, refractive status, strabismus