

Effects of the screening program on ROP in Cali, Colombia

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ROP is the first cause of childhood blindness in Cali, and in spite of sufficient scientific and technical information on how to evaluate these infants, there are no government programs to address this problem.

Objective: To show how important it is to increase screening coverage and treatment for ROP with appropriate systems and good strategies aimed at decreasing the rates of this disease and reducing childhood blindness in Cali, Colombia.

Methodology: Medical charts from the service of pediatric ophthalmology in the University of Valle were reviewed. The focus was on newborns weighing under 1500 g and / or younger than 32 weeks of gestational age, born between January 1, 2001 until December 31, 2005, and hospitalized at the CIRENA unit. The intervention program works with all staff members, medical and paramedical, teaching them awareness of the ROP problem: to personalize children, for instance, telling them by mother's first name of those that are now studying at the school for the blind. Other important messages include being alert to perform screenings and provide treatment if necessary.

Results: 78 patients out of 266 (29.3%) were screened in 2001 with a rate of treatment of 18%; in 2002, 45.6% (140/307) were screened with a treatment rate of 15.7%, and in 2003 the screening rate was 89.7% (297/331) with 7.4% of treatment rate. In 2004, the screening rate was 86.51% (295/340) with 5.4% of treatment, and in 2005 the screening rate was 98.9% (364/386) and treatment 4.9%.

Discussion: The rate of screened newborns shows a growth tendency, from 29.3% to 98.9%, in the last five years. Simultaneously, the rate of children requiring treatment decreased from 18% to 4.9%. This is the result of the implementation of early screening practices plus education and sensitization in the care of newborns by the paramedical staff.

Conclusions: The treatment of ROP has better results with education activities and awareness promotion for all staff members who deal with newborns and medical care indicators for screening.

Key words: ROP, children blindness, public health, intervention program

INTRODUCTION

Research shows that retinopathy of prematurity is on the rise in Latin America and will soon become a public health problem (1, 2). A study reports that in Colombia, blindness due to retinopathy of prematurity accounted for 10.6% of all blindness in 1996 (3), and a more recent study published in 2005 sets this figure at 23.90% (4). In Cali, capital of the Valle del Cauca department, retinopathy of prematurity is the first cause of childhood blindness, accounting for 33.8% of all the cases (5), and the situation is identical in Argentina, Brazil, Costa Rica, Perú and Cuba (4, 6, 7), which shows that the rising trend is clearly documented in Latin America.

In industrialized countries like U. S. A, Canada and Europe, two epidemics of blindness caused by retinopathy of prematurity have occurred; the first presented itself in newborns whose weight was between 1000

and 1500 g between the years 1941 and 1953, leaving 12,000 blind children (8). The second epidemic is happening right now in newborn weighing under 900 g; everything seems to suggest that this trend will present itself with premature babies in developing countries, of varied weights and gestational ages (4).

ROP is a bilateral vasoproliferative disorder that affects premature babies. In its most strong forms, this disease results in severe visual limitations or blindness with the subsequent financial costs on the community and the individual. Such impairment not only affects visual development, but also has implications in conceptual, motor and language development and in the normal socialization process of children within their community; all of these become worst (or more manifest) when formal education begins (9).

At the moment, there are no governmental programs in Colombia that make the routine of eye fundus exami-

nation with dilated pupil mandatory for all newborns at risk of developing this disease. Currently, protocols are being developed in neonatal and ophthalmologic scientific societies in an attempt to increase awareness about the need of screening and increased coverage, which would result in an improvement of the diagnosis and of the treatment itself of retinopathy of prematurity.

Objective

To show the importance of increased coverage of screening programs in the treatment of retinopathy of prematurity in Cali, Colombia, and extrapolate this experience to other regions in the country. The programs implement adequate systems of remission strategies that aim at reducing the rate of occurrence of this disease and with it, one of the main causes of avoidable blindness in Cali.

METHODS

This is a descriptive study in which we reviewed the medical charts of newborns at the Pediatric Ophthalmic Service in the CIRENA Unit at the University Hospital between January 2001 and December 31, 2005.

The inclusion criteria for this study were that the patient had been hospitalized at the CIRENA unit in the *Hospital Universitario del Valle* (University Hospital, HUV), with a weight under 1500 g and/or gestational age under 32 weeks, born between January 1, 2001 and December 31, 2005 (January 1, 2006). These data were confronted with the numbers on weight distribution and gestational age provided in the CIRENA neonatal bulletin to calculate the ROP rate in the different years (2001, 2002, 2003, 2004 and 2005) so that they may be compared afterwards with the information from the different neonatal intensive care units (NICUs) in other regions of the country.

Until end of 2001 we only review patients sent by neonatologists for consultation and to whom a medical chart with two copies was established, one for the hospital records and the second one for the service of pediatric ophthalmology of the University of Valle with additional data like date of birth, sex, birth weight, gestational age, date of first eye examination, stage of ROP, treatment given (cryo, laser, VR surgery).

In 2002, the staff at the CIRENA Unit in the University Hospital (nurses, nurses' aids, respiratory therapists, medical students and neonatologists) began receiving lectures in which they were introduced to the pathogenesis, etiology, classification and treatment of ROP. Each talk lasted 20 minutes, with final 10 minutes in which they were shown how the children who had been at that same unit were they work were being rehabilitated at the *Instituto de niños ciegos y sordos del Valle del Cauca* (Institute for Blind and Deaf Children of the Valle del Cauca). The staff was given the infant mother's name so they could realize which children now required special education at an institution for the visually impaired and prove them that this was not only statistics but the reality of our region and our unit. The talks ended with

a video which presented how rehabilitation is carried out at the *Instituto*, including images of the children, happy and singing.

In 2002 we instituted a flowchart (see p. 178) with all tasks to be done.

Starting March 2003, the talks also included a study (10) where the fraction of inspired oxygen FiO_2 range is established at 20–50% and the pressure of oxygen saturation, SpO_2 at 86–93 for infants under 1000 g and 86–95 for those under 1500 g. These talks took place every 6 months with nurses, nurses' aids, respiratory therapists, medical students and neonatologists present.

RESULTS

In 2001, 78 patients out of the 266 total who checked out alive of the unit were examined. These corresponded to those with weights under 1500 g and / or 32 weeks of gestational age. Fourteen patients were taken to cryo with a treatment rate for retinopathy of prematurity of 17.95% and a screening rate of 29.32%. In 2002, 104 of the 307 eligible were examined with a treatment rate of 15.7% (22 were given treatment) and a screening rate of 45.6%. In 2003, 297 of the 331 live newborns were examined, with a treatment rate of 7.4% (22 were given treatment) and a screening rate of 89.7%. In 2004, 295 of the 240 patients were examined, with a rate of treatment of 5.4% (16 were given treatment). In 2005, 364 of the 368 patients were examined, with a resulting treatment rate of 4.94% (18 operations were performed) and a screening rate of 98.9%.

Treatment rate (cryo, laser, VR surgery)

$$\frac{\text{Number of treated children with severe ROP}}{\text{Number of children with fundus examination}} \times 100$$

Screening rate

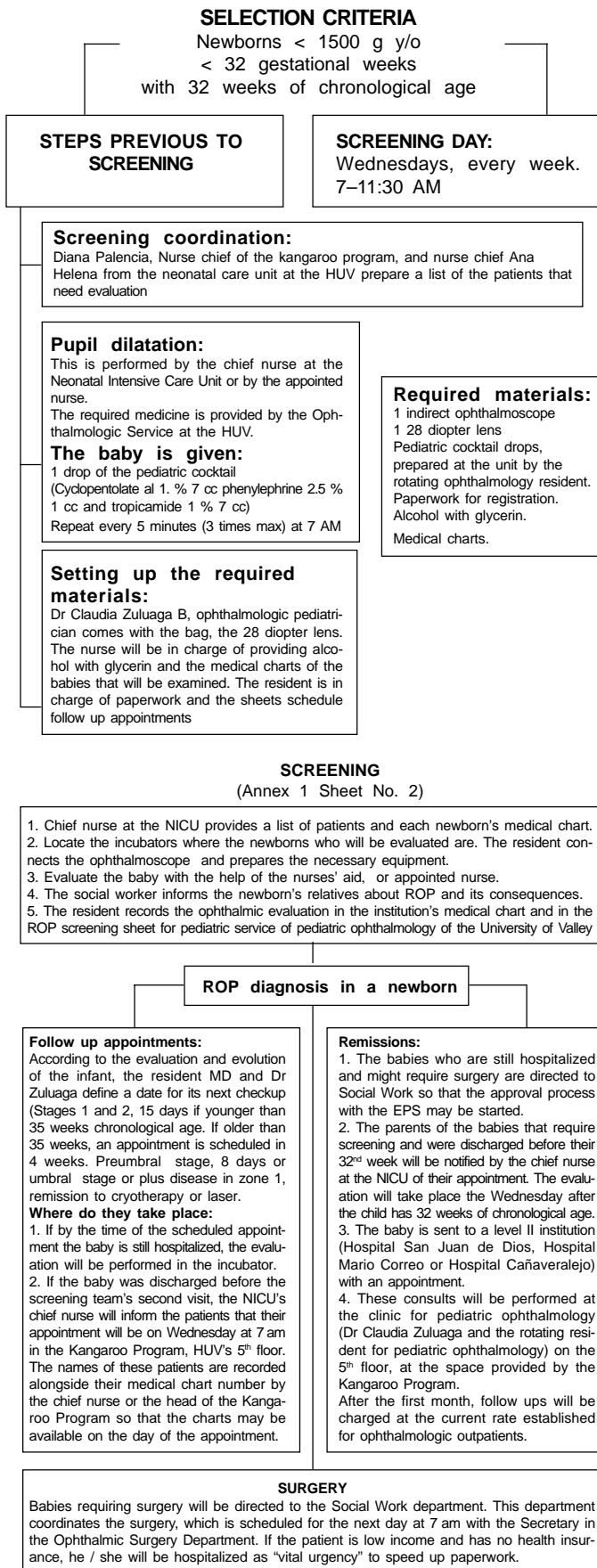
$$\frac{\text{Number of children with fundus examination}}{\text{All children at risk}} \times 100$$

DISCUSSION

Greater commitment to ROP prevention from the personnel working at the neonatal intensive care unit is facilitated when they are provided with the names of the children who were born in the unit they work in and are now studying in institutions for low vision children and also when they are shown the statistics, as severe as these might seem. Knowledge of the disease as one of the ways of providing quality neonatal care makes the staff reflect on how well they are performing their duties and gives scientific bases with which to improve their performance.

CONCLUSIONS

When the program becomes stable, the coverage increases and the need for treatment is reduced.



The staff at the NICU responds more positively to special childcare when exposed to educational and awareness promoting activities.

Establishing protocols that indicate which patients are at risk and how often they should be monitored helps in increasing the rate of screened infants and decreasing the rate of patients with severe retinopathy of prematurity that merit treatment.

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Flowchart. Ophthalmologic evaluation protocol for the HUV (Hospital Universitario del Valle)