Refraction in Premature Babies: A Prospective Study

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Myopia is a frequent finding in premature babies. As it appeared from our series, 42-45 percent of the eyes were in the myopic range of refraction shortly after birth. One-half year after birth there was a change of refraction towards emmetropia in most of the children. The purpose of this paper is to report further changes in refraction in children born prematurely.

MATERIAL AND METHODS

Sixty-seven children (134 eyes) born in the years 1969-1970 were examined at birth and followed for seven years. The examination included general ophthalmic examination and refraction. Cycloplegia was achieved by dripping ethylpicolamide (mydriaticum) three times with a break of ten minutes every time. The examination was carried out one-half hour after the last drop was administered. All the children were examined and followed-up by the same examiner. The family history for myopia was carefully taken.

RESULTS

Fig. 1 shows the distribution of refraction. For simplification, the refraction is shown at birth, at the age of one-half year, and at the age of seven years. There is a continuous tendency in changing the refraction towards emmetropia especially among the myopic children.

Fig. 2 illustrates the changes in refraction; the children can be divided into three groups according to refraction at birth. In most of the children there is a change of refraction towards emmetropia.

Fig. 3 shows the distribution of refraction at the age of seven years in the different groups according to birth weight.

DISCUSSION

The refraction pattern in premature babies has been investigated in a number of studies. It is generally agreed that "myopia of prematurity" is connected with retrolental fibroplasia. The presence as well as the degree of the myopia were correlated to the severity of the early retinal changes during the active RLF. Only four percent of the children who had not shown retinal changes neonatally were myo-

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Fig. 1. Distribution of refraction on examination at birth (I), at the age of one-half year (II), and at the age of seven years (III).
As we have shown, 42-45 percent of the eyes were myopic at birth. We could not find any evidence of RLF. On the follow-up during seven years there was a continuous tendency in changes of refraction towards emmetropia.

As shown in Fig. 2, the children can be divided into three groups according to the refraction at birth. Children, hypermetropic at birth, follow the full-term babies’ pattern in changing the refraction. The children, emmetropic at birth, remain mostly emmetropic at the age of seven years.

In the largest group of myopic eyes 46 percent became emmetropic at the age of seven years, 54 percent remain myopic. All the myopic eyes showed a lower degree of myopia than at birth. Careful fundus examination did not show any abortive signs of RLF. There was no relationship between the degree of myopia and birth weight and no relationship between

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Fig. 2. Changes in refraction.

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Fig. 3. Distribution of refraction at the age of seven years in different groups according to birth weight.
birth weight and the changes of refraction during the years. There was no difference of refraction either at birth nor at the age of seven years between the children of myopic and nonmyopic parents.

Myopia of prematurity is mostly lenticular in origin. Biometric study revealed greater thickness of the lens in premature children at the age of ten than in mature children. The refractive power of the lens changes during the years which explains the decrease of myopia.

Further follow-up of the myopic group will answer the question of how many children will remain myopic and in how many of these children will myopia increase in the pre-adolescent period.

SUMMARY

Refraction in 67 premature babies was examined and followed during seven years. There was continuous changing of refraction towards emmetropia in all refraction groups. Fifty-four percent of myopic eyes remained myopic at the age of seven years but in all the eyes myopia was of lower degree than at birth. In our series there was no relationship between myopia and RLF.

REFERENCES