

Visual Acuity in Patients with Retinopathy of Prematurity Treated With Photocoagulation

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DOI: [10.36347/sjams.2019.v07i09.006](https://doi.org/10.36347/sjams.2019.v07i09.006)

| Received: 04.09.2019 | Accepted: 11.09.2019 | Published: 18.09.2019

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Abstract

Original Research Article

To evaluate visual acuities of the patients with retinopathy of prematurity (ROP) who received retinal photocoagulation therapy. **Methods:** Enrolled subjects were 56 eyes of 30 patients who had undergone retinal photocoagulation for ROP. Visual acuity was measured by standard Landolt ring with a distance of 5 m. The patients were divided into two groups dependent on the extent of the treated retina; i.e., 360° group (treatment over the whole circumference of the retina; n=37) and 180° group (treatment over half of the retina; n=19). **Results:** Best-corrected visual acuity (BCVA) of 1.0 \leq , 0.8 to 0.9, and 0.5 to 0.7 were obtained in 36 eyes (64.3%), 11 eyes (19.6%), and 9 eyes (16.1%), respectively. In 360° group, BCVA of 1.0 \leq , 0.8 to 0.9, and 0.5 to 0.7 were obtained in 21 eyes, 7 eyes, and 9 eyes, respectively. In 180° group, BCVA of 1.0 \leq , 0.8 to 0.9, and 0.5 to 0.7 were obtained in 15 eyes, 4 eyes, and 0 eyes, respectively. There were no statistically significant differences in visual acuities between the two groups. **Conclusion:** Visual acuities after retinal photocoagulation for ROP were generally good regardless of the extent of treated retina.

Keywords: Retinopathy of prematurity, Photocoagulation, Visual acuity.

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INTRODUCTION

Evaluation of visual function in retinopathy of prematurity (ROP) treated with photocoagulation treatment is often difficult to compare with the same criteria because of individual case variability such as age at examination and psychomotor development. In this report, we evaluated visual acuities in patients with ROP who received retinal photocoagulation therapy.

SUBJECTS AND METHODS

Enrolled subjects were 56 eyes of 30 patients who had undergone retinal photocoagulation for ROP between 2004 and 2014 at Jichi Medical University Hospital. The mean birth weight of the patients was 822 \pm 302 g (range: 420- 1552 g) and gestational age was 26.7 \pm 2.5 weeks (range: 23- 32 weeks). All cases were systematically managed in our neonatal intensive care unit, and photocoagulation was performed under sedation by intravenous anesthesia. The age of photocoagulation was 35.1 \pm 2.8 weeks (range: 31- 42 weeks). The patients were divided into two groups dependent on the extent of the treated retina; i.e., 360° group (treatment over the whole circumference of the

retina; n=37) and 180° group (treatment over half of the retina; n=19) (Table-1).

Table-1: Two groups dependent on the extent of the treated retina

	birth weight mean \pm SD (range)	gestational age mean \pm SD (range)
360° group	789 \pm 264 g (420~1356 g)	26.5 \pm 2.4 weeks (23~32 weeks)
180° group	841 \pm 341 g (560~1552 g)	26.8 \pm 2.6 weeks (23~31 weeks)

Visual acuity was measured by standard Landolt ring with a distance of 5 m. The age at which best-corrected visual acuity (BCVA) was obtained was 7.7 \pm 2.1 years (range: 5- 12 years).

RESULTS

In all subjects, BCVA of 1.0 \leq , 0.8 to 0.9, and 0.5 to 0.7 were obtained in 36 eyes (64.3%), 11 eyes (19.6%), and 9 eyes (16.1%), respectively.

In 360° group, BCVA of 1.0 \leq , 0.8 to 0.9, and 0.5 to 0.7 were obtained in 21 eyes (56.8%), 7 eyes

(18.9%), and 9 eyes (24.3%), respectively. In 180° group, BCVA of $1.0 \leq$, 0.8 to 0.9, and 0.5 to 0.7 were obtained in 15 eyes (78.9%), 4 eyes (21.1%), and 0 eyes, respectively. There were no statistically significant differences in visual acuities between the two groups ($P = 0.065$).

In patients with zone I ROP ($n=10$), BCVA of $1.0 \leq$, 0.8 to 0.9, and 0.5 to 0.7 were obtained in 4 eyes (40%), 2 eyes (20%), and 4 eyes (40%), respectively. In patients with zone II ROP ($n=33$), BCVA of $1.0 \leq$, 0.8 to 0.9, and 0.5 to 0.7 were obtained in 20 eyes (60.6%), 8 eyes (24.2%), and 5 eyes (15.2%), respectively. In patients with zone III ROP ($n=13$), BCVA of $1.0 \leq$, 0.8 to 0.9, and 0.5 to 0.7 were obtained in 12 eyes (92.3%), 1 eyes (7.7%), and 0 eyes, respectively.

DISCUSSION

The highlight of this study is the measurement method of visual acuity; i.e. standard Landolt ring with a distance of 5 m. Although the measurement method and measurement age are different, Maeda *et al.*, [1] evaluated 166 patients with ROP at the age of 3 years. According to their report, BCVA of $0.6 \leq$, 0.3 to 0.5, and ≤ 0.2 were obtained in 90 eyes (54.2%), 55 eyes (33.1%), and 21 eyes (12.7%), respectively. Tachikawa *et al.*, [2] evaluated 84 patients with ROP, BCVA of $1.0 \leq$ was obtained in 33 eyes (39.3%) at the age of 6 years. In addition, BCVA of $1.0 \leq$ was obtained in 13 eyes (21.7%) of 60 eyes in 360° group. In contrast, BCVA of $1.0 \leq$ was obtained in 20 eyes (83.3%) of 24 eyes in 180° group.

Yagi *et al.*, [3] reported that the average logarithm of the minimum angle of resolution (log MAR) was 0.39 ± 0.33 in 360° group, and 0.34 ± 0.36 in 180° group. In our present study, log MAR was 0.025 ± 0.14 in 360° group, and -0.039 ± 0.07 in 180° group. Thus, visual acuities were relatively good.

Measurement of refractive components [4] and long-term follow-up [5] are necessary to further evaluate the visual function in patients with ROP.

CONCLUSION

We emphasized that visual acuities after retinal photocoagulation for ROP were generally good regardless of the extent of treated retina. We believe that the results will be useful information when explaining to families.

Disclosure: The authors declare no conflicts of interest.

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