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Outcomes of diode laser photocoagulation for aggressive posterior retinopathy of prematurity

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Summary

Aim: Agressive posterior retinopathy of prematurity is a special subtype of retinopathy of prematurity. Accurate and timely diagnosis and treatment could prevent further ocular and visual morbidity. In this study, we aimed to evalute the outcomes of agressive posterior retinopathy of prematurity treated with diode laser photocoagulation.

Material and Method: Records of preterm infants who were diagnosed as agressive posterior retinopathy of prematurity and treated with diode laser photocoagulation were reviewed. Associated perinatal findings and treatments were also evaluated. Anatomic and structural success (regression of ROP and attached macula) were evaluated. Progression of retinopathy or need of surgery in spite of treatment was described as failure.

Results: Twenty six (46%) male and 30 (54%) female infants were included in the study. The mean birth weight was 1214.26 gr (590-2250) and the mean gestational age was 28.76 weeks (25-34). Seventeen (30%), 31 (51%), 30 (54%), 18 (32%) and 41 (72%) infants had blood transfusion, jaundice, septicemia, anemia and respirator distress, respectively, 41 (72%) patients had oxygen supplementation, 86 (86.73%) of 98 eyes had favorable outcomes, 76 (77.55%) eyes showed complete regression and 9 (9.18) eyes had partial regression. Poor outcome was observed in 13 (13.27%) eyes and these progressed into stage 4B and 5.

Conclusions: Agressive posterior retinopathy of prematurity can be treated with diode laser photocoagulation with a high success rate. Observation of agressive posterior retinopathy of prematurity in premature newborns with a higher birth weight and advanced gestational age in our country can be evaluated as a signal to consider perinatal care more precisely in Turkey. *(Turk Arch Ped 2012; 47: 254-256)*

Key words: Aggressive posterior retinopathy of prematurity, diode laser, prematurity, retinopathy

Introduction

Retinopathy of prematurity (ROP) is a vasoproliferative disease of the retina which occurs in newborns. Although many cases regress spontaneously, some forms progress to retinal detachment rapidly and lead to blindness. Aggressive posterior retinopaty of prematurity (international terminology: AP-ROP) is one of the severe forms of this disease. If it is not treated, it rapidly progresses to stage 5 ROP (complete retinal detachment). The characteristics of this disease include posterior localization, prominent plus disease and unclear borders of retinopathy (1). Although data about aggressive posterior ROP are limited, there are many studies showing that diode laser photocoagulation (DLP) is an efficient treatment method (2,3,4,5). In this study, we presented the outcomes of diode laser photocoagulation in our patients with aggressive posterior ROP.

Material and Method

The data files of 98 eyes belonging to 56 newborns registered in Cerrahpaşa Medical Faculty, Department of Ophtalmology Retina Division who underwent DLP between June 2007 and December 2010 according to The International Classification of Retinopathy of Prematurity (ICROP) criteria (1) which were rearranged in 2005 and The Early Treatment for Retinopathy of Prematurity Study (ETROP) criteria (6) were examined retrospectively. Gestational age, birth weights,

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time of the first examination, presence of prenatal and postnatal problems and prenatal and postnatal treatments, time of laser treatment, follow-up times and anatomic success after DLP reported in the file records were examined.

Diagnosis and treatment

Premature infants were examined by two specialists of retina (SBA, SA) experienced in ROP under the guidance of an anesthesiologist by dilating the pupils with 0.25% cyclopentolate, 2.5% phenylephrine HCL and 0.5% tropicamide and using an indirect ophtalmoscope and 20 or 28 D lenses with the help of ecarteur and chrochet. The patients were staged by making a classification according to ICROP criteria following examination. The first vizits were performed between the 28th and 40th days after delivery in Cerrahpaşa Medical Faculty Ophtalmology Clinic Retina Division or in the neonatal intensive care unit, if necessary. The diagnosis of aggressive posterior ROP was made based on ICROP classification. DLP was performed by two experienced specialists of retina on the day of diagnosis or in 48 hours after obtaining informed consent from the parents. Diode laser photocoagulation was completed by placing combined laser spots on the avascularized retina. This procedure was performed under the supervision of an anesthesiologist under local anesthesia.

Response to treatment

The patients were examined in the first week after DLP was performed and were reevaluated in the 1, 3 ,6, 12th months after treatment response occured. The main expectation here was obtaining anatomic success. Treatment response was defined as good outcome (regression) or poor outcome (progression). In addition, good response was divided into two groups as complete regression and satisfactory response (partial regression). Complete regression was described as absence of vitroretinal shrinkage with a clinically normal macula and absence of enlargement of vessels or absence of neovascularization. Satisfactory response was defined as settled macula and partial retinal detachment accompanied by shrinkage which did not involve the macula (stage 4a). Poor outcome was defined as conditions which progress to stage 4b (partial retinal detachment involving the macula) or stage 5 (complete retinal detachment).

Results

26 of the patients (46%) were female and 30 (54%) were male. The mean gestational age at birth was found to be 28.76 weeks (25-34 weeks) and the mean birth weight was found to be 1214.26 g (590-2250 g). 17 of the patients (30%) had a history of blood transfusion, 31 (55%) had a history of jaundice, 30 (54%) had a history of sepsis, 18 (32%) had a history of anemia, 41 (72%) had a history of respiratory distress syndrome and 41 (72%) had undergone oxygen treatment. Good anatomic outcome was obtained in 86 (86.73%) of 98 eyes after diode laser photocoagulation. 76 of these (77.55%) had complete regression and 9 (9.18%) had partial regression. Poor outcome was obtained in 13 eyes (13.27%) and these eyes progressed to stage 4b and 5 ROP.

Discussion

Aggressive posterior ROP occurs in high risk infants who have a birth weight of less than 1000 g and a gestational week younger than 28 week at birth. Successful outcomes have been reported with DLP in such cases (2,3,4,5). In a study performed by Drenser et al. (4) in USA, an anatomic success rate of 81.8% with DLP was reported in patients with aggressive posterior ROP. Jajali et al. (5) reported a success rate of 87.5% in the study they performed in India. In our study, the success rate was found to be 86.73%. We believe that this success rate compatible with the literature arised from the fact that we performed a treatment method based on rearranged ICROP criteria and ETROP criteria. In addition, performance of DLP on the day of diagnosis or in 48 hours prevented rapid progression of the disease and this increased our success rate.

In developed countries, aggressive posterior ROP is observed in infants with very low birth weight or with a gestational age of younger than 26 weeks at birth with a higher rate (6,7). Shah et al. (8) observed aggressive posterior ROP in infants with a heavier birth weight and more advanced gestational age at birth in a study they performed in India. Shah et al. (8) stated that this could be related to inappropriate oxygen treatment during the perinatal period. In our study, both the birth weight and gestational age were higher compared to CRYO-ROP and ETROP studies. Like Shah et al. (8), we also concluded that this could be related to oxygen treatment during the perinatal period.

Conclusively, the high success rate in patients with ROP in our clinic may be explained by appropriata performance of up-to-date diagnostic and therapeutic protocols. Again, our study showed that DLP is an efficient treatment method in patients with aggressive posterior ROP. However, occurence of aggressive posterior ROP in infants with heavier birth weights and more advanced gestational age at birth indicated that these infants should be reevaluated in terms of perinatal care.

Conflict of interest: None declared.

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