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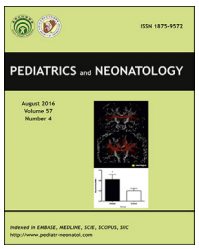

Original Article

Effect of oral propranolol on periocular Capillary Hemangiomas of Infancy☆

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Key Words
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Background: To assess the safety and efficacy of oral propranolol in the management of periocular Capillary Hemangiomas of Infancy (CHI).
Methods: Medical records of 21 infants diagnosed with periocular capillary hemangioma during a period of 5 years from 2009 to 2014 were retrospectively reviewed. The data collected included demographic details, clinical features and details of imaging studies and response to the therapy. All patients received oral propranolol under the supervision of a pediatrician. The initial dose was 0.2–1 mg/kg body weight, which was increased to 2 mg/kg body weight (3 divided doses) in 48 h if there was no adverse reaction to the initial dose. The response to the treatment was assessed clinically as well as by radiographic imaging. Photographic documentation was done periodically.
Results: Out of 21 patients, 18 were females and remaining three were males. The median age at the time of presentation was 4 months. The most common presenting feature was lid mass (n = 17, 80%) followed by proptosis (n = 7, 33%). Reddish discoloration of face was seen in 2 (1%) patients. All patients showed reduction in the size of the lesion. None of the patients included in this study had any adverse reaction to propranolol or recurrence following cessation of the therapy.
Conclusion: Oral propranolol is highly effective and safe in the treatment of periocular capillary hemangiomas in infants.

☆ Presentations: Part of this study has been presented in 1. Tamil Nadu Ophthalmic Association Annual Meeting, 2014, Coimbatore, India. 2. All India Ophthalmology Conference, 2015, New Delhi.

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1. Introduction

Capillary Hemangioma of Infancy (CHI) is the most common benign vascular tumor in children. Capillary hemangioma involutes spontaneously by 7 years of age in up to 70% of the patients.[1,2] Hence historically management consisted of close observation. However, CHI in the periocular region, especially involving the upper eyelid, can be potentially vision threatening specially in infants where it obscures the visual axis. These infants require early intervention to prevent stimulus deprivational amblyopia. Numerous approaches have been tried in such cases, such as oral or intra-lesional corticosteroids.[1,3] Oral propranolol, a non-selective beta-blocker, is a recent addition in the armamentarium against CHI.[4] Propranolol causes endothelial cell apoptosis, decreased blood flow along with inhibition of angiogenesis thus causing a rapid decrease in size of the lesion. Literature states a rapid onset of action as early as within 1 week from onset of treatment. This rapid onset along with low cost and side effect profile of the drug makes it highly suitable for treatment. Most of the studies on the efficacy of the drug include data from both periocular and systemic lesions. Data regarding use of propranolol for only periocular lesions are few and in the form of case reports or small case series with very few reports from India.[1,2,5–7]

We report a series of children with periocular capillary hemangiomas who were treated with oral propranolol. To the best of our knowledge, this is the largest series reported from India.

2. Materials and methods

Records of 21 infants diagnosed with CHI during a period of 5 years between 2009 and 2014 at a tertiary care hospital in India were retrospectively reviewed. Institutional review board and ethics committee approval was taken and the study followed the tenets of declaration of Helsinki.

Infants with periocular and orbital capillary hemangioma causing severe mechanical ptosis with obscuration of visual axis; progressive proptosis; significant anisometropia; or gross cosmetic deformity were considered as indications for treatment and were included in the study.

Demographic details including age, gender and gestational age at time of delivery were recorded for analysis. All the infants underwent a comprehensive ophthalmic evaluation including cycloplegic refraction and dilated fundus evaluation using indirect ophthalmoscopy. Location and size of the lesion were noted specially in reference to their impact on the visual axis. Radio imaging was done to establish the diagnosis if indicated. Most children underwent magnetic resonance imaging (MRI) as it helps to delineate the lesion better and decreases the risk of exposure to radiation which occurs with Computed Tomography (CT). Imaging was done in children under sedation with clinically evident proptosis with no external lesion or children with cutaneous lesions in whom an orbital component was suspected. MRI was the preferred modality of imaging. MRI was repeated, if, on follow up, no evidence of regression of the lesion was detected, or when some amount of residual lesion was suspected. The response to treatment was measured clinically. Follow up was advised after 1 week, 1 month, 3 months, 6 months and 1 year. Photographic documentation was done periodically at each follow up to assess decrease in the size of the lesion. For the purpose of this study, improvement was defined as either a decrease in the size of lesion based on serial photographs or on imaging findings when present. Change in the color or texture of the skin overlying the lesion was also documented.

All patients underwent a detailed systemic and cardiac evaluation prior to the therapy. The therapy was initiated under the supervision of a pediatrician. Inpatient younger than 6 months, the initial dose of propranolol was 0.2 mg/kg body weight in three divided doses. Blood glucose level and blood pressure were monitored for a period of at least 48 h. In the absence of any adverse reaction, the dose was increased to 2 mg/kg body weight/day. In patients older than 6 months; the initial dose of oral propranolol was 1 mg/kg body weight. It was increased to 2 mg/kg body weight after 48 h of monitoring provided there were no adverse events. Dose was adjusted as the infants gained weight during the follow up. Each patient was initially reviewed after 1 week and then at 1 month, 3 months, 6 months and 1 year, by both the ophthalmologist as well as the pediatrician. All children received oral propranolol throughout the duration of their proliferative phase. Children showing significant decrease or complete resolution of the lesion clinically or radiologically were advised to taper oral propranolol over a period of 2 weeks and then stop the medication.

All data were maintained using Microsoft Excel and analyzed using SPSS software 14.0. A p value of <0.05 was considered statistically significant.

3. Results

The median age at the time of presentation was 4 months (interquartile range: 7.50 months). Out of 21 patients, 18 (85%) were female. All infants, barring two were full term babies. The average duration of presenting symptoms was 4.11 months. The most common presenting features were lid mass ($n = 17$) followed by proptosis ($n = 7$). Reddish discoloration on the face was also seen in 2 patients. Six infants (28.57%) had lid swelling that obscured the visual axis (Fig. 1a & b). Magnetic Resonance Imaging (MRI) was done in 15 patients, Computed Tomography (CT) scan in two and ultrasonography (USG) in one patient. Based on the imaging, the lesions were found to involve the intra and extra-conal compartments in 4 patients, preseptal and extraconal spaces in 3 patients, purely extraconal in 4 patients and intraconal in 1 patient (Fig. 2a, b, c & d).

Two out of the 21 patients were lost to follow up. All the remaining patients showed improvement on clinical examination, as well as on imaging. Improvement was noticeable as early as within 1 week of initiating therapy in 6 patients. Nine patients showed significant improvement between 2 and 8 weeks and remaining 4 patients showed improvement by the 20th–24th week (Figs. 3 and 4). The average duration for first signs of clinical improvement was at around

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