



## Original Article

# Treatment of Periocular Infantile Capillary Haemangioma with Oral Propranolol, A Case Series of Eight Children

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**Purpose:** To study the efficacy of oral propranolol in the treatment of periocular infantile capillary haemangioma (PICH).

**Design:** Case series.

**Participants:** Eight children presenting with PICH having visual axis occlusion, proptosis, cosmetic blemish or worry of the parents.

**Methods:** All patients received oral propranolol at a dose of 2 mg/kg body weight/day in two divided doses. A complete systemic and ocular examination and serial photographs were taken before, during and after treatment.

**Results:** Two patients were lost to follow up, five resolved fully. One patient developed drug reaction and discontinued treatment after good initial response.

**Conclusion:** Oral propranolol seems to be an effective drug for treatment of PICH with a good safety

**Key Words:** Propranolol, Capillary haemangioma, Proptosis, Bradycardia



## Introduction:

Infantile Capillary Haemangioma is the most common tumor of eyelids in infancy<sup>1</sup> and is particularly more common in females<sup>2</sup>. It usually presents at birth but may be noticed later after few weeks when it starts to proliferate. It usually undergoes an initial phase of rapid progression, followed by slow phase of regression marked by apoptosis. 30% of the tumors regress completely by the age of 3 years and 70% by the age of 7 years<sup>3</sup>.

PICH may involve any part of the body including periorbital area, nose, face, airways, skin folds and anogenital regions. Posterior fossa tumours, Haemangiomas, Arterial anomalies, Cardiac anomalies, Eyes and Sternal malformations (PACES) syndrome have greater chances of amblyopia<sup>4</sup>. Several treatment modalities have been used to treat capillary hemangiomas. Intra lesional/perilesional injections of corticosteroids (Triamcinolone diacetate) have been the first line therapy for symptomatic capillary hemangiomas<sup>5</sup>. Other modalities include Interferon therapy<sup>6</sup>, vincristine<sup>7</sup>, laser therapies<sup>8</sup> or surgical excision<sup>9</sup>.

A recent serendipitous observation by Leaute-Lebrezeet all found that growth of PICH can be inhibited by propranolol<sup>10</sup>.

The present study shows the effect of oral propranolol treatment on eight case of PICH referred to a tertiary care ophthalmology department.

## Materials and Methods:

Charts of children with PICH treated with oral propranolol were reviewed retrospectively between June 2013 and Dec 2014. The treatment protocol consisted of oral propranolol 2mg/kg/day in two divided doses.

Study was carried out at Institute of Ophthalmology.

All patients underwent a thorough ocular examination with particular emphasis on visual acuity testing, presence or absence of axial or nonaxial proptosis, ptosis and if present amount of ptosis, exposure keratitis and skin ulceration. Examination under anaesthesia, dilated fundus examination and cycloplegic refraction were performed in every case.

Electrocardiography, Echocardiography, Blood Pressure, Pulse and Blood sugar were documented in every patient. Every patient was examined by a paediatric cardiologist, or Paediatrician to rule out any contraindication to oral propranolol therapy. Special requests were sent for thorough CVS and Respiratory system examination.

Parents (both father and mother where possible) were thoroughly discussed and counselled about possible side effects of propranolol. A written consent was taken from either parent.

B-Scan ultrasonography was done to document the size of the lesion where required.

Mother (both parents where possible) was taught how to measure heart rate of the child. Features of common side effects like Hypoglycaemia, Bradycardia, Allergic reactions were told to the parents. They were instructed to feed the child before every dose. They were advised to stop the medication and seek immediate medical advice in case of any untoward effect.

All the children were admitted in the hospital for first 24 hours to administer drug under supervision. Those coming from other cities remained admitted for more than a day depending upon their distance and convenience.

Serial photographs before treatment and at every followup visit were taken. VAS was used to document treatment response.

## INCLUSION CRITERIA

### PICH causing:

- Occlusion of visual axis
- Cosmetic Blemish
- Worry of the parents

### Exclusion Criteria:

Patients already treated or under treatment with other modalities, PHACES syndrome, Systemic contraindications to propranolol therapy.

Treatment was stopped at complete flattening of PICH or in case of adverse effects.

### Followup:

All children were examined at start of therapy, one week, one month and then every month till total regression. Minimum follow up was six months.

### Main Outcome Measures:

Regression of lesion on B-Scan Ultrasonography and VAS

### Secondary Outcome Measures:

Improvement in VA, Astigmatic error, amblyopia, and efficacy and safety of drug

### Results:

Total No. of Patients were 08. Out of which 02 were males while 06 were females. Age range at the time of presentation was from 01 month to 03 years. Out of 08 patients, 05 presented with complete ptosis and occlusion of visual axis, 02 presented with fullness of orbit with cosmetic blemish and 01 patient had hemangioma involving whole side of the face.

**Fig.1: Hemangioma involving whole of the face**



Oral propranolol 2mg/kg was started in every patient twice a day.

One patient was lost to the follow up while one female child developed skin allergy in whom further treatment was stopped.

Initial response in all patients was very promising showing 50% reduction in tumor size within 24 -72 hours. Then there was a slow recovery phase leading to complete removal of tumor size in 04 – 06 months.

Finally, at the end of 06 months there was complete resolution of tumor in all the cases.

**Fig. 2: Before treatment: Complete ptosis**



**Fig.3: Initial Response within 48 hours: Ptosis improving**



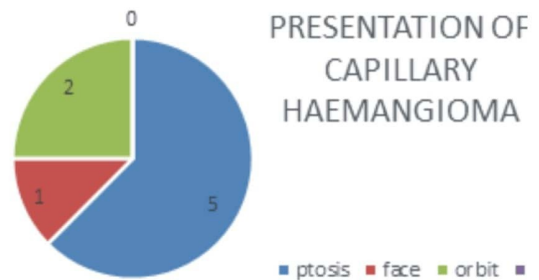
**Fig. 4: Two months after treatment: significant reduction of tumor**



**Fig. 5: After 04 months: complete alleviation of ptosis**



**Fig. 6: Presentation of Capillary Hemangioma**



**Table 1: Gender Distribution**

Gender	Number	Percentage
Male	02	25%
Female	06	75%

**Table 2: Response to Therapy**

Recovery	Number	Percentage
complete	06	100%
No recovery	00	0%





## DISCUSSION:

PICH are not so uncommon childhood tumors. They grow maximally during first year of life. Females are more affected than males. Tumors regress spontaneously and completely by four years of age in 32% to 60% and by upto 7 years in 72% to 76%. As period of regression may be very long keeping in view the growing and vulnerable period, the child can develop sensory deprivation amblyopia due to occlusion of visual axis. Astigmatism is also a possibility due to mass effect. Amblyopia can occur in 44 to 45% of cases.

Infantile capillary haemangiomas have an initial growth phase followed by regression phase. Basic fibroblast growth factor and vascular endothelial growth factor (VEGF) are two major angiogenic factors responsible for initial growth phase. Apoptosis has been shown to be responsible for involutinal phase.

Propranolol is a nonselective beta blocker. Potential mechanisms for the therapeutic role of this drug on capillary haemangioma include vasoconstriction, reduced expression of angiogenic factors and apoptosis of capillary endothelial cells.

Leatete-Lebrezeet all serendipitously observed regression of capillary haemangioma with propranolol in 2008. Many other studies have observed a dramatic initial response to oral propranolol in colour, size and volume of the tumour. We observed first response to oral propranolol within 24 to 72 hours.

This initial, rapid and sizeable response is very effective to control amblyopia as compared to corticosteroid therapy. Improvement in astigmatism to nonamblyogenic level with propranolol therapy was reported by Rola Al-Dhaby et al in upto 78% cases. In OUR STUDY

Propranolol may cause hypoglycaemia and bradycardia most commonly. Hypoglycaemia or masking of its symptoms due to propranolol therapy is serious in children. They can be diagnosed and managed easily with suitable precautions. Prematurity, infancy, wheezing, asthma and hyperkalaemia are some of the high risk factors leading to side effects.

In our case series of eight children, one child (female with hemifacial PICH), developed skin allergic reaction in the later stages of treatment. With consultation from the dermatologist, treatment was stopped. No other patient developed any side effects.

## Limitation of Study:

It is a small study. We could not get MRI of the patients due to various factors. Our selection criteria were very strict keeping in mind the potential side effects of propranolol.

Our study showed very good results and low risk profile as far as side effects are concerned. According to this

study propranolol can be considered an effective and safe first line therapy for PICH.

## Conclusion:

Oral propranolol was found to be an effective modality for treatment of PICH with good safety profile.

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