

Evaluating the Effects of Topical Timolol 0.5% (Ophthalmic Solution) Over the Scalp in Case of Infantile Hemangioma

Niraj¹, Amit Ranjan², Surabhi Shandilya¹

¹Assistant Professor, Department of Dermatology, Varun Arjun Medical College and Rohilkhand Hospital, Banthra,, Shahjahanpur, Uttar Pradesh, India, ²Assistant Professor, Department of Dermatology, Netaji Subhas Medical College and Hospital, Bihta, Patna, Bihar, India.

Abstract

Background: Infantile hemangioma (IH) is the most common tumour reported during infancy. These lesions are mostly proliferate during the first year of life after that involutions naturally happen within 7 years of age. We studied 15 patients out of whom seven completed all follow ups who were treated for IH on the scalp with topical application of 0.5% timolol maleate ophthalmic solution. The aims & objectives is to evaluate the effects and adverse effects of 0.5% topical timolol maleate solution in infantile hemangioma on the scalp. **Subjects and Methods:** Up to six month old children were included and treated with the drops of 0.5% timolol maleate ophthalmic solution twice daily on the lesions for 6 months. At the end of the study, patients were assessed about the acceptable outcome like, cosmetically acceptance, functional improvement, adverse reactions, especially alopecia. **Results:** Out of fifteen, seven children treated and followed up with timolol topical application. After six months treatment with 0.5% timolol maleate ophthalmic solution, the ratio of lesions which had complete improvement was 28.57% (2/7), substantial change in 14.28% (1/7), moderate change in 14.28% (1/7), fair change in 14.28% (1/7), minimal change in 14.28% (1/7), and only 1/7 cases (14.28%) did not change and the lesion increased in size. There were no adverse effects observed. **Conclusion:** Timolol maleate 0.5% ophthalmic solution has showed promising and safe results for the treatment of infantile hemangioma of scalp after 6 months of treatment without any significant side effect.

Keywords: Infantile Hemangioma, Timolol, Infantile Scalp Tumor.

Corresponding Author: Niraj, Assistant Professor, Department of Dermatology, Varun Arjun Medical College and Rohilkhand Hospital, Banthra,, Shahjahanpur, Uttar Pradesh, India.
E-mail: drmiraj1985@gmail.com

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Introduction

Hemangioma is Localised proliferative process of angioblastic mesenchyme, represents clonal expression of endothelial cells. It is the most common tumour in infants and proliferate during early life and involutes naturally between 2-7 years of age. Its etiopathogenesis has not yet been completely, angiogenic factors, mast cell, endogenous steroid hormones, placental injury during prenatal chorionic villus sampling have all been suggested as factors.^[1,2] Hemangiomas of infancy are usually solitary, soft, well defined, round, dome shaped, scarlet red swelling with a smooth or lobulated surface; occasionally may be multiple. Rapid increase in size occurs in majority of hemangiomas in the first 6-9 month, and most lesions attain their maximum size by 1 year however,^[3-5] there are reports of continued growth even beyond puberty.^[6] Almost all hemangiomas regress spontaneously, beginning at an average time of 10 month.^[7-9] The cause of this spontaneous involution

is unknown, although the role of mast cells and estrogen have been under study.^[10] Thirty percent of hemangiomas involute by the age of 4 years, 50% (5 th year) and 75% (7th year).^[8] Treatment modalities are Immunosuppressive drugs, the flashlamp pulse dye laser (FPDL) is now used, as there is minimal pigmentation and almost no scarring,^[11] systemic non-selective beta-blockers. Use of topical treatment with timolol has been reported Timolol eye drop. It is a non-selective beta-adrenergic receptor blocking agent which acts via Vasoconstriction, reduction in pro-angiogenic signals, and induction of apoptosis.

Aims & Objectives

To evaluate the effects of 0.5% topical timolol maleate ophthalmic solution in infantile hemangioma on the scalp.

Subjects and Methods

Study was conducted at Department of Dermatology, Varun Arjun Medical College and Rohilkhand Hospital, Shahjahanpur Uttar Pradesh after taking institutional ethical approval. Parents of children were subjected to detailed history taking in a prescribed format (onset, duration and evolution of lesions and drug history, family history, present and past medical history). Study was conducted for one-year period, and total number of patients interviewed in outpatient were twenty in which fifteen were included based on inclusion criteria and only seven patients reported in follow ups.

Inclusion Criteria:

1. Age Below 6 month
2. Previously not treated
3. Superficial hemangioma,
4. Thickness <3mm

Exclusion Criteria:

1. No Active Infections
2. Not associated with other disorder / Syndrome
3. Hemangioma present on site other than Scalp
4. No history of Asthma and CHF
5. Thickness >3mm

Investigations: Complete blood count, Blood sugar, ESR, Routine examination of urine, Renal function test, Liver function test, ECG, Echocardiography, Ultrasonography, MRI

- Therapeutic effects was assessed by an investigator's global assessment.
- Vitals (blood pressure, heart rate) with height and weight of the patients were also measured at first and every 4 week intervals and digital photographs were preserved.
- At the end of the study, a comparative assessment was done with special focus over the basic morphological changes, functional improvement, adverse reaction. As per the inclusion criteria infant were treated with 2 drops/cm² lesion of hemangioma over scalp with 0.5% timolol maleate(5mg/ml) ophthalmic solution twice daily for 6 months.

Results

After six months of treatment with 0.5% timolol maleate ophthalmic solution, the percentage of lesions which showed complete improvement was 28.57% (n=2), substantial change in 14.28% (n=1), moderate change in 14.28% (n=1), fair change in 14.28% (n=1), minimal change in 14.28% (n=1), and only 14.28% cases (n=1) did not change and the lesion increased in size.

No significant adverse effects were observed, such as loss of hair in or around the hemangioma.

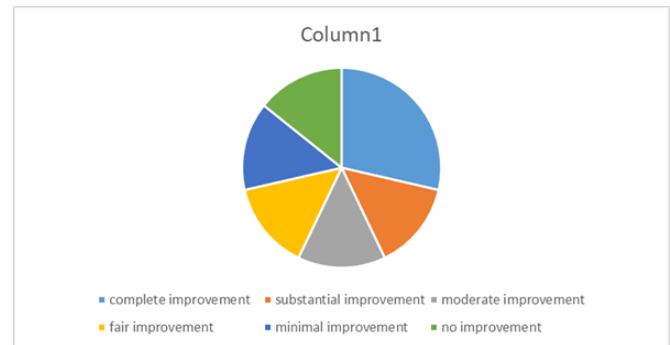


Figure 1: Pie chart showing relative proportion of outcome after timolol application



Figure 2: ?

Discussion

The first successful outcomes following the use of timolol solution in the treatment of a 4-month-old infant with superficial capillary hemangioma of the eyelid reported by Linjun Yu.^[12] However there are relatively few studies on timolol treatment for IH, and the majority of these are case reports. Timolol is a topical β -adrenergic antagonist (non-selective) that has been used in ophthalmology for many years. Its predominant adverse effects include hypotension, hypoglycemia, bronchospasm and local pruritus. A study conducted by Syed Ali Raza Rizvi et al (2012) has demonstrated the effect of topical 0.5% timolol maleate solution in producing significant reduction of large cutaneous capillary.^[13] In the present

Table 1: ?

Serial	Age in	Sex	Diameter in centimetre(cm)		Surface area in cm ²	
			At first visit	At last visit, Six months	At first visit	At last visit, six months
1.	4	M	2.5	2	6.62	4.14
2.	5	F	1	0	1.26	0
3.	2	F	2.6	1	5.53	0.85
4.	3	M	3	2	7.68	3.12
5.	3	M	0.5	0	0.32	0
6.	3	M	1.3	1.6	1.42	2.16
7.	5	F	2.5	2.3	9.63	8.69

Table 2: ?

Serial number	Improvement	Percentage (%)
1.	complete	28.57
2.	substantial	14.28
3.	moderate	14.28
4.	fair	14.28
5.	minimal	14.28
6.	no	14.28

study, the drug was applied topically to the scalp and, therefore, there was minimal absorption of the drug into the bloodstream. There were no systemic adverse reactions observed during the treatment period of the study. These findings were also replicated by study done by Syed Ali Raza Rizvi.^[13] Furthermore, no adverse effects have been also reported in previous studies, with the exception of mild pruritus over the lesion following four weeks of treatment in a study by Torey Lau et al where timolol application was used to treat an 18-month-old female with ulcerated hemangiomas associated with PHACE syndrome.^[14] Topical timolol treatment in superficial IH has many advantages, and appears very useful as an effective, safe and relatively convenient treatment for this subtype of IH in patients up to 6 months of age.

Conclusion

Timolol maleate 0.5% ophthalmic solution is effective and safe for the treatment of infantile hemangiomas located on the scalp. There were no significant adverse effects observed. Larger sample size studies needed for better statistical analysis and validation of study.

Limitation of Study

Small sample size is the major limitation of study.

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