Original Research Article

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A study on effectiveness of topical steroid therapy in boys with phimosis in the age group of 5 to 10 years

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ABSTRACT

Background: Phimosis defined as the inability to retract the prepuce over the glans of penis is a common condition affecting boys. Objective was to study the effectiveness of topical steroid therapy (0.05% clobetasol propionate cream) in boys with phimosis in the age group of 5 to 10 years.

Methods: This retrospective observational study was conducted at the Department of Pediatrics and Department of Surgery at Arunai Medical College and Hospital, Thiruvannamalai, Tamilnadu, India among 74 boys in the age group of 5 to 10 years with phimosis. The effect of twice daily application of 0.05% clobetasol propionate cream for six weeks on phimosis was studied.

Results: out of the 74 boys, 25 (33.78%) were in the age group of 5 to 6 years, 20 (27.02%) in the age group of 7 to 8 years and 29 (39.19%) in the age group of 9 to 10 years. As per Kikiros et al system of grading of retraction of foreskin, majority of the boys 30 (40.54%) were grade 4, followed by grade 2 (24 boys, 32.43%), grade 3 (14 boys, 18.93%) and grade 5 (6 boys, 8.1%). Out of the 74 boys with phimosis, 53 boys (71.62%) had associated complications. After 6 weeks of topical steroid therapy, 39 (52.71%) boys showed complete response, 24 (32.43%) boys showed partial response and 11 (14.86%) boys showed no response to the treatment regimen. There was no significant correlation between age of boys and grade of phimosis with treatment response. Significant correlation was noted between history of urinary tract infection and treatment response. None of the other complications showed significant correlation with treatment response. None of the boys had any side effects to topical steroid therapy.

Conclusions: Topical steroid application can be tried as an effective treatment modality in boys with phimosis in the age group of 5 to 10 years.

Keywords: Children phimosis, Topical steroid phimosis, Clobetasol propionate phimosis

INTRODUCTION

Phimosis is defined as the inability to retract the prepuce over the glans of penis. It is a common childhood condition affecting boys. Surgical treatment of phimosis by circumcision is being considered as the main stay of treatment in boys with phimosis. Kikiros et al in their study in 1993 proposed that local application of topical steroids can may obviate the need for circumcision. ¹ In our study, we aim to assess the effectiveness of topical steroid therapy in boys with phimosis in the age group of 5 to 10 years after a duration of 6 weeks of treatment.

Objectives

Objective was to study the effectiveness of topical steroid therapy (0.05% clobetasol propionate cream) in boys with phimosis in the age group of 5 to 10 years.

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METHODS

This retrospective observational study was conducted at the Department of Pediatrics and Department of Surgery at Arunai Medical College and Hospital, Thiruvannamalai, Tamilnadu, India among 74 boys in the age group of 5 to 10 years with phimosis. Data were collected retrospectively from hospital records. Boys with phimosis attending the outpatient clinic or admitted as inpatients in the department of Pediatrics and department of surgery from September, 2019 to September 2020 fulfilling the inclusion and exclusion criteria were included in the study.

Retraction of foreskin in boys were graded as per the grading proposed by Kikiros et al (Table 1).¹

Table 1: Retractability grading of phimosis by Kikiros et al.

Grade	Description
0	Full retraction, not tight behind glans, or easy retraction limited only by congenital adhesions to the glans
1	Full retraction of foreskin, tight behind the glans
2	Partial exposure of glans, prepuce (not congenital adhesions) limiting factor
3	Partial retraction, meatus just visible
4	Slight retraction, but some distance between tip and glans, i.e. neither meatus nor glans can be exposed
5	Absolutely no retraction

Inclusion criteria

The study were boys with Phimosis in the age group of 5 to 10 years with Kikiros et al grade 2, 3, 4 and 5 whose parents were willing to participate in the study.

Exclusion criteria

The study were boys with Kikiros et al grade 0 and 1, boys with buried penis, Balanitis xerotica obliterans and boys whose parents were not willing to participate in the study.

After obtaining informed consent from parents, demographic details and clinical data regarding grading of phimosis, clinical presentation, symptoms and details of treatment were collected retrospectively from hospital data. Boys were prescribed topical steroid (0.05% clobetasol propionate cream) and advised to apply it twice daily to slightly retracted foreskin and to massage gently while retracting the foreskin. The boys were evaluated after six consecutive weeks of topical steroid application. Treatment success was defined as full retraction (Kikiros et al grade 0 and 1). Those with Kikros et al grade 0 and 1 were defined as complete

response, those with improvement in grade of phimosis were defined as partial response and boys with no change in grade or worsening of grade of phimosis were defined as no response. Details regarding potential side effects of topical steroid therapy (striae, pigmentation changes and telangiectasia) were evaluated. Data collected were analyzed by suitable statistical methods using SSPS 25 software. Statistical significance was assessed at 5% level of significance (p<0.05).

RESULTS

A total of 118 boys fulfilled the inclusion and exclusion criteria over the study period, of which 20 children were excluded due to non-adherence to the treatment regimen, 18 were excluded as the boys could not be followed up and 6 of the boys were excluded as they underwent circumcision surgery before the completion of six weeks of topical steroid therapy. Total 74 boys were included in the study and statistical analysis done.

Out of the 74 boys, 25 (33.78%) were in the age group of 5 to 6 years, 20 (27.02%) in the age group of 7 to 8 years and 29 (39.19%) in the age group of 9 to 10 years.

Table 2: Demographic profile of the boys (based on age and socioeconomic status).

Demographic profile	N (%)			
Age group (in years)				
5 to 6 years	25 (33.79)			
7 to 8 years	20 (27.02)			
9 to 10 years	29 (39.19)			
Socioeconomic status				
Class I (upper)	7 (9.45)			
Class II (upper middle)	17 (22.97)			
Class III (middle)	21 (28.38)			
Class IV (upper lower)	15 (20.27)			
Class V (lower)	14 (18.93)			

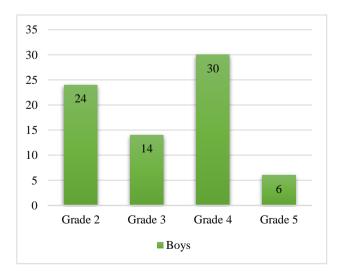


Figure 1: Distribution as per grading of phimosis.

As per modified Kuppusamy's socio economic status scale, 9.45% belonged to class I (upper), 22.97% were class II (upper middle), 28.38% were class III (middle), 20.27% belonged to class IV (upper lower) and 18.93% belonged to class V (lower). The demographic distribution as per the boy's age and socioeconomic status is shown in Table 2.

As shown in Figure 1, as per Kikiros et al system of grading of retraction of foreskin, majority of the boys 30 (40.54%) were grade 4, followed by grade 2 (24 boys, 32.43%), grade 3 (14 boys, 18.93%) and grade 5 (6 boys, 8.1%).

Out of the 74 boys with phimosis, 53 boys (71.62%) had associated complications. The number of boys with associated complications are shown in Table 3. Urinary tract infection was the most common complication observed in our study.

Table 3: Boys with associated complications.

Complications	Number of boys (%)		
Urinary tract infection	41 (55.40)		
Balanoposthitis	29 (39.19)		
Voiding difficulty	24 (32.43)		

After 6 weeks of topical steroid therapy, 39 (52.71%) boys showed complete response, 24 (32.43%) boys showed partial response and 11 (14.86%) boys showed no response to the treatment regimen as shown in (Figure 2). None of the boys who underwent topical steroid therapy experienced any side effects of topical steroid therapy.

The distribution of treatment response based on age of the boys is shown in (Table 4). No statistically significant correlation was found between age of the boys and treatment response (p>0.05).

The distribution of the treatment response in the boys based on the grade of phimosis is shown in (Table 5). 52.71 % of the total boys (n=74) showed complete response to topical steroid treatment with majority of the boys with grade 2 (91.67%) showing complete response. Only 18.92% of the boys with grade 4 phimosis showed complete response. None of the boys with grade 5 phimosis showed complete response was seen in 66.67% of the boys with grade 5 phimosis.

The treatment response to topical steroid therapy in boys with the complications of phimosis is shown in (Table 6). There was statistically significant correlation between treatment response and history of urinary tract infection (p value<0.05). No statistically significant correlation was found between treatment response and other complications.

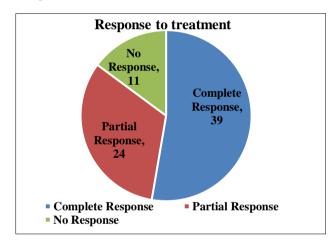


Figure 2: Response to topical steroid therapy.

Table 4: Distribution of treatment response based of age of the boys.

	Treatment response			
Age (in years)	Complete	Partial	No	Total
	N (%)	N (%)	N (%)	
5 to 6	12 (48.00)	9 (36.00)	4 (16.00)	25
7 to 8	12 (60.00)	6 (30.00)	2 (10.00)	20
9 to 10	15 (51.72)	9 (31.04)	5 (17.24)	29
Total	39	24	11	74

P value - 0.922456 (not significant).

Table 5: Distribution of treatment response based of grade of phimosis.

Grade of phimosis	Treatment respons	Treatment response				
	Complete	Partial	No	Total		
	N (%)	N (%)	N (%)			
2	22 (91.67)	0 (0)	2 (8.33)	24		
3	3 (21.43)	8 (57.14)	3 (21.43)	14		
4	14 (18.92)	14 (18.92)	2 (6.67)	30		
5	0 (0)	2 (33.33)	4 (66.67)	6		
Total	39 (52.71)	24 (32.43)	11 (14.86)	74		

Table 6: Distribution of treatment respon	nse in boys with complications.
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	Treatment response				
Complication	Complete	Partial	No	Total	P value
	N (%)	N (%)	N (%)		
Urinary tract infection	21 (51.22)	18 (43.9)	2 (4.88)	41	0.018032 (<0.05)
Balanoposthitis	14 (48.28)	5 (17.24)	10 (34.48)	29	0.244212
Voiding difficulty	11 (45.83)	6 (25.00)	7 (29.17)	24	0.672379

DISCUSSION

Circumcision is a surgical procedure being done in pediatric age group for several indications such as phimosis, paraphimosis, recurrent balanitis, religious reasons and social reasons. Phimosis remains the major indication of circumcision in pediatric age group. A prospective survey on indications and morbidity of circumcision in children by Griffiths et al observed that of the 140 children studied, 80% underwent circumcision for indication of phimosis.² In a study by Rickwood et al in England, it was observed that phimosis accounts for 87% of cases of circumcision in children under 15 years of age, of whom almost one-half are under 5 years of age.³

The incidence of pathological phimosis is 0.4 per 1000 boys per year or 0.6% of boys are affected by their 15th birthday.⁴ Several studies are being done to find effective medical treatment for phimosis as an alternative to circumcision. Topical steroid therapy and preputial dilatation and stretching are alternate treatment options being tried in phimosis. Prolonged antibiotic therapy, intralesional steroid injection, carbon dioxide laser therapy, and radial preputioplasty alone or with intralesional injection of steroid are all few experimental therapies for phimosis lacking in proper randomized trials.⁵

Kikiros et al from the Royal Children's Hospital, Australia studied the effectiveness of topical steroid application for 4 weeks in 63 children with phimosis and observed that 51 children showed improvement to normal or near normal state obviating the need for circumcision.¹

Two important mechanisms are proposed for the effect of topical steroids in phimosis. The first mechanism proposed is an anti-inflammatory and immuno suppressive effect regulated by glucocorticoid activity, stimulating the transcription of anti-inflammatory genes and decreasing the transcription of inflammatory genes. Humoral factors involved in the inflammatory response and leukocyte migration are inhibited. Glucocorticoids also interfere with the function of endothelial cells, granulocytes, and fibroblasts. ^{1,6}

The second mechanism of topical steroids is related to a skin thinning effect caused by the inhibition of collagen synthesis. Glucocorticoids inhibit the synthesis of hyaluronic acid, the main glycosaminoglycan produced by fibroblasts. Thus, the dermal extracellular matrix is reduced and collagen and elastin fibers become tightly packed and rearranged.⁶

In our study, 0.05% clobetasol propionate cream was applied twice daily for six consecutive weeks in boys with phimosis in the age group of 5 to 10 years and treatment response assessed after 6 weeks. Of the 74 boys studied, 39 (52.71%) boys showed complete response, 24 (32.43%) boys showed partial response and 11 (14.86%) boys showed no response to the treatment regimen. These results were similar to those observed by Kikiros et al. ¹

In a study by Ashfield et al among 228 boys with phimosis, six weeks of topical steroid therapy showed an overall efficacy of 87% at 3 months follow up.⁷ Orsola et al observed a good response of 90% among 137 boys with phimosis.⁸ Similar results were observed in several studies including those by Chu et al (95%), Makhija et al (81%), Wright et al (80%), Monsour et al (67%), Jørgensen et al (70%), Ng et al (84%) and Webster et al (82%).⁹⁻¹⁵

In a study of 88 patients with severe phimosis (Kikiros retractability grade of 4 or 5) complete response was seen in 68.2% of participants in the study by Lee et al.⁶ This is in contrast to our study in which complete response was observed in only 18.92% of the participants with Kikiros retractability grade 4 and none of the participants with Kikiros grade 5 showed complete response. Further studies are required to study the efficacy of topical steroids in boys with severe phimosis.

In our study, 51.22% of the boys with phimosis with history of urinary tract infection showed complete response and 43.9% showed partial response. 48.28% of the boys with coexisting Balanoposthitis showed complete response and 17.24% of the boys showed partial response. In the study by Ashfield et al, conservative treatment with topical steroid therapy was successful in 88% and 75% of patients coexisting balanitis and history of urinary tract infection, respectively. These results show that topical steroid therapy could be considered a conservative line of management in childhood phimosis with coexisting balanoposthitis and history of urinary tract infection.

No side effects were observed to topical steroid therapy in our study. This is similar to the results observed by several authors including Kikiros et al, Lee et al, Golubovic et al and Elmore. 1,2,16,17

Our study is limited by the lack of long term follow up to assess the risk of recurrence of phimosis and future need for circumcision in boys showing complete and partial treatment response. Data regarding risk of recurrence will help us understand if topical steroid therapy for phimosis can be an effective alternative for circumcision in boys with phimosis. Only 0.05% clobetasol propionate cream has been used as the topical steroid in our study. Comparison of the efficacy of various topical steroid formulations will help to make better treatment recommendation in boys with phimosis.

CONCLUSION

Our study shows that topical steroid therapy is an effective treatment for boys with phimosis and can be tried as a conservative mode of management before surgical interventions. Further studies with more sample size, different topical steroid formulations and long term follow up will help us learn more about the effectiveness of this treatment modality and help to make better recommendations regarding topical steroid therapy for phimosis in boys.

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Ethical approval: The study was approved by the

Institutional Ethics Committee

REFERENCES

- 1. Kikiros CS, Beasley SW, Woodward AA. The response of phimosis to local steroid application. Pediat Surg Int. 1993;8(4):329-32.
- 2. Griffiths DM, Atwell JD, Freeman NV. A prospective survey of the indications and morbidity of circumcision in children. Eur Urol. 1985;11(3):184-7.
- 3. Rickwood AM, Walker J. Is phimosis overdiagnosed in boys and are too many circumcisions performed in consequence?. Ann Roy Colle Surge Engl. 1989;71(5):275.
- 4. Shankar KR, Rickwood AM. The incidence of phimosis in boys. Brit J Urol Int. 1999;84(1):101-2.
- 5. Shahid SK. Phimosis in children. ISRN urol. 2012;2012.

- Lee CH, Lee SD. Effect of topical steroid (0.05% clobetasol propionate) treatment in children with severe phimosis. Korea J Urol. 2013;54(9):624-30.
- Ashfield JE, Nickel KR, Siemens DR, MacNEILY AE, Nickel JC. Treatment of phimosis with topical steroids in 194 children. J Urol. 2003;169(3):1106-8.
- 8. Orsola A, Caffaratti J, Garat JM. Conservative treatment of phimosis in children using a topical steroid. Urol. 2000;56(2):307-10.
- 9. CHU CC, Chen KC, DIAU GY. Topical steroid treatment of phimosis in boys. J Urol. 1999;162(3 Part 1):861-3.
- Makhija D, Shah H, Tiwari C, Dwiwedi P, Gandhi S. Outcome of topical steroid application in children with non-retractile prepuce. Dev Period Med. 2018;22(1):71-4.
- 11. Wright JE. The treatment of childhood phimosis with topical steroid. Australian and New Zealand. J Surg. 1994;64(5):327-8.
- 12. Monsour MA, Rabinovitch HH, Dean GE. Medical management of phimosis in children: our experience with topical steroids. J Urol. 1999;162(3):1162-4.
- 13. Jørgensen ET, Svensson A. The treatment of phimosis in boys, with a potent topical steroid (clobetasol propionate 0.05%) cream. Acta dermatovenereol. 1993;73(1):55-6.
- 14. Ng WT, Fan N, Wong CK, Leung SL, Yuen KS, Sze YS, et al. Treatment of childhood phimosis with a moderately potent topical steroid. ANZ J Surg. 2001;71(9):541-3.
- 15. Webster TM, Leonard MP. Topical steroid therapy for phimosis. Canad J Urol. 2002;9(2):1492.
- 16. Golubovic Z, Milanovic D, Vukadinovic V, Rakic I, Perovic S. The conservative treatment of phimosis in boys. Brit J Urol. 1996;78(5):786-8.
- 17. Elmore JM, Baker LA, Snodgrass WT. Topical steroid therapy as an alternative to circumcision for phimosis in boys younger than 3 years. J Urol. 2002;168(4):1746-7.

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