Treatment of Pediatric Epistaxis: A Systematic Review and Meta-Analysis



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Introduction

Pediatric epistaxis is most commonly caused by dry nasal mucosa and digital trauma to the anterior septum (Kiesselbach's Plexus) and accounts for up to 1 in every 200 emergency department visits.¹

Current literature approximates the prevalence of recurrent pediatric epistaxis of 9%.²

Methods and Materials

PubMed, **Embase**, and **Web of Science** databases were queried and this review was conducted in accordance with the **2020 PRISMA guidelines**.

- The primary outcome measured was resolution of epistaxis at primary follow up.
- A meta-analysis of pooled success rate with an inverse variance statistical method and fixed effects analysis model was performed.

Results

Of the 579 abstracts initially screened, 17 full-text articles were included in this review consisting of 1,315 patients.

In the included studies which reported ages and gender, the average age in the pediatric population was 9.7 years old; 61% of the patients were male while 39% were female.

The average MINORS score of included studies was moderate at 12.9.

While interventions for recurrent epistaxis in adults and epistaxis caused by inherited disorders (i.e. HHT) are well documented, there is a paucity of literature focused on idiopathic pediatric epistaxis.

 This review includes evidence on commonly used interventions including observation, topical emollients, silver nitrate cautery, and a combination of these agents. The methodological index for non-randomized studies (MINORS) criteria was used to assess quality of studies.



- Silver nitrate cautery was the most reported treatment modality analyzed in 42.8% of included studies while topical emollients were the second most reported treatment modality analyzed in 29% of included studies.
- The meta-analysis demonstrated the following pooled rates of complete resolution of epistaxis:
 - Observation <u>42</u>% (3 studies, 95% CI 0.31-0.53);
 - Topical treatments (emollients, antiseptic creams) <u>65</u>% (4 studies, 95% CI 0.58-0.72)
 - Silver nitrate cautery <u>79</u>% (6 studies, 95% CI 0.74-0.84
 - Silver nitrate cautery with topical treatments- <u>69</u>% (2 studies, 95% CI 0.65-0.73)
 - Propranolol <u>86</u>% (2 studies, 95% CI 0.77-0.95)
 - Microwave ablation <u>93</u>% (2 studies, 95% CI 0.88-0.98)

Highlights

Figure 3: Endoscopic view of

Kiesselbach's Plexus in Anterior

Septum

> Of the **579 abstracts** initially screened, **17 full-text articles** were included in this review. (Figure 2)

	Identification of studies via databases and registers								
	Records identified from*:	Records removed before screening:							
	Databases (n = 597)	Duplicate records removed (n = 18)							
		Records marked as ineligible by automation tools (n =							

- 14 of 17 studies were included in the meta-analysis of pooled rates of complete resolution of epistaxis.
 (Figure 1)
- Silver nitrate cautery and topical treatments, either in conjunction or individually, are effective treatments for recurrent pediatric epistaxis.
- > Oral propranolol and in-clinic microwave ablation are promising treatments that warrant further study.
- > **Observation alone** is **unlikely** to provide resolution of recurrent pediatric epistaxis.

		Pooled Success Rate			Pooled Success Rate			
Study or Subgroup	Pooled Success Rate	Rate SE Weight IV, Fixe		IV, Fixed, 95% CI		IV, Fixed, 95% CI		
Microwave Ablation (2 studies)	0.93	0.025	23.0%	0.93 [0.88, 0.98]			-	
Observation (3 studies)	0.42	0.054	4.9%	0.42 [0.31, 0.53]				
Propanolol (2 studies)	0.86	0.046	6.8%	0.86 [0.77, 0.95]				
Silver Nitrate Cautery (6 studies)	0.79	0.025	23.0%	0.79 [0.74, 0.84]				
Topical + Cautery (2 studies)	0.69	0.022	29.7%	0.69 [0.65, 0.73]			•	
Topical Treatments (4 studies)	0.65	0.034	12.5%	0.65 [0.58, 0.72]				
Total (95% CI)			100.0%	0.76 [0.74, 0.79]			•	
Heterogeneity: $Chi^2 = 112.62$, df Test for overall effect: $Z = 63.47$			-1	-0.5	0 0.5 1			
	•						Pooled Success Rate	

Figure 1: Forest Plot of Meta-Analysis of Success Rates of Pediatric Epistaxis Management. Diamond, overall effect estimate; square, point estimate of the study; black line, 95% CI



Figure 2: PRISMA Flow Diagram for Systematic Review of Treatment of Pediatric



Contact

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