

EFFICACY OF INTRANASAL DEXMEDETOMIDINE IN COMBINATION WITH KETAMINE AS PREMEDICATION AND SEDATION IN PEDIATRIC PATIENTS: A SYSTEMATIC REVIEW AND META-ANALYSIS

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INTRODUCTION

Premedication in children is helpful for both separating the child from their parent and reducing the child's stress and anxiety. Dexmedetomidine's potential to attenuate the sympathetic response, provide sedation and decrease emergence agitation are properties that may be favorable in its combination with ketamine.

OBJECTIVES

To compare the efficacy and safety of the combination of dexmedetomidine and ketamine administered via the intranasal route on sedation of children aged 0 to 12 years old prior to elective surgery or procedural sedation as compared to intranasal dexmedetomidine.

METHODS

Six randomized controlled trials fulfilled eligibility criteria following literature search. Meta-analyses of mean differences were conducted to examine variances in sedation onset and recovery times. Meta-analyses of proportions were done to estimate incidence of sedation success, satisfactory sedation at parental separation and mask induction and adverse events.

RESULTS

The overall incidence of sedation success was higher among children premedicated with intranasal dexmedetomidine and ketamine (RR = 1.05; 95%CI = 0.97,1.13; P = 0.27, $I^2 = 20\%$) however, was not statistically significant.

	IN Dex-	-Ket	IN De	ex		Risk Ratio		Risk Ratio	Risk of B
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% CI	Year	M-H, Random, 95% CI	ABCDE
Bhat 2016	25	27	25	27	21.9%	1.00 [0.86, 1.16]	2016		97999
Mang Sun 2020	29	30	28	30	32.0%	1.04 [0.92, 1.16]	2020		
Aly 2020	25	29	23	29	10.3%	1.09 [0.86, 1.38]	2020		
Sado-Filho 2021	40	44	40	44	26.8%	1.00 [0.88, 1.14]	2021		
Lu 2022	27	29	21	30	9.0%	1.33 [1.03, 1.72]	2022		00000
Total (95% CI)		159		160	100.0%	1.05 [0.97, 1.13]		•	
Total events	146		137						
Heterogeneity: Tau ² : Test for overall effect	= 0.00; Ch			4 (P =	0.29); l ²	= 20%		0.5 0.7 1 1.5 2 Favours IN Dex Favours IN Dex-K	et
Heterogeneity: Tau ² :	= 0.00; Ch			4 (P =	0.29); l ² :	= 20%			H 2 let
Heterogeneity: Tau ² : Test for overall effect	= 0.00; Ch			4 (P =	0.29); l ² :	= 20%			H 2 let
Heterogeneity: Tau ² : Test for overall effect <u>Risk of bias legend</u>	= 0.00; Ch : Z = 1.11	(P = 0	.27)		0.29); I ² :	= 20%			H 2 let
Heterogeneity: Tau ² : Test for overall effect <u>Risk of bias legend</u> (A) Random sequence	= 0.00; Ch : Z = 1.11 e generatio	(P = 0	.27) ction bias		0.29); I ² :	= 20%			H 2 let
Heterogeneity: Tau ² : Test for overall effect <u>Risk of bias legend</u> (A) Random sequenc (B) Allocation conceal	= 0.00; Ch : Z = 1.11 e generation ment (selection	(P = 0 on (selection bi	.27) ction bias as)	;)		= 20%			H 2 let
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Children given intranasal dexmedetomidine and ketamine had faster sedation onset time (WMD = -7.17; 95%CI = -12.44, -1.89; P=0.008) with greater incidence of satisfactory sedation at mask induction (RR = 1.41; 95%CI = 1.06, 1.88]; P<0.02). There was no significant difference as to recovery time and incidence of adverse events among the groups.

CONCLUSION AND RECOMMENDATIONS

Premedication with intranasal dexmedetomidine - ketamine is as safe as but of better efficacy than intranasal dexmedetomidine without increasing clinically relevant adverse events. Further studies to standardize combination drug dosages is recommended.

