Posted on Authorea 16 May 2021 — The copyright holder is the author/funder. All rights reserved. No reuse without permission. — https://doi.org/10.22541/au.162113107.72098189/v1 — This a preprint and has not been peer reviewed. Data may be preliminary.

Effects of nebulized epinephrine in association with hypertonic saline for infants with acute bronchiolitis: a systematic review and meta-analysis

Renan Pereira[1], Versiéri Almeida[1], Mariana Zambrano[1], Linjie Zhang[2], and Sérgio Amantéa[1]

[1]Universidade Federal de Ciências da Saúde de Porto Alegre
[2]Universidade Federal do Rio Grande

May 16, 2021

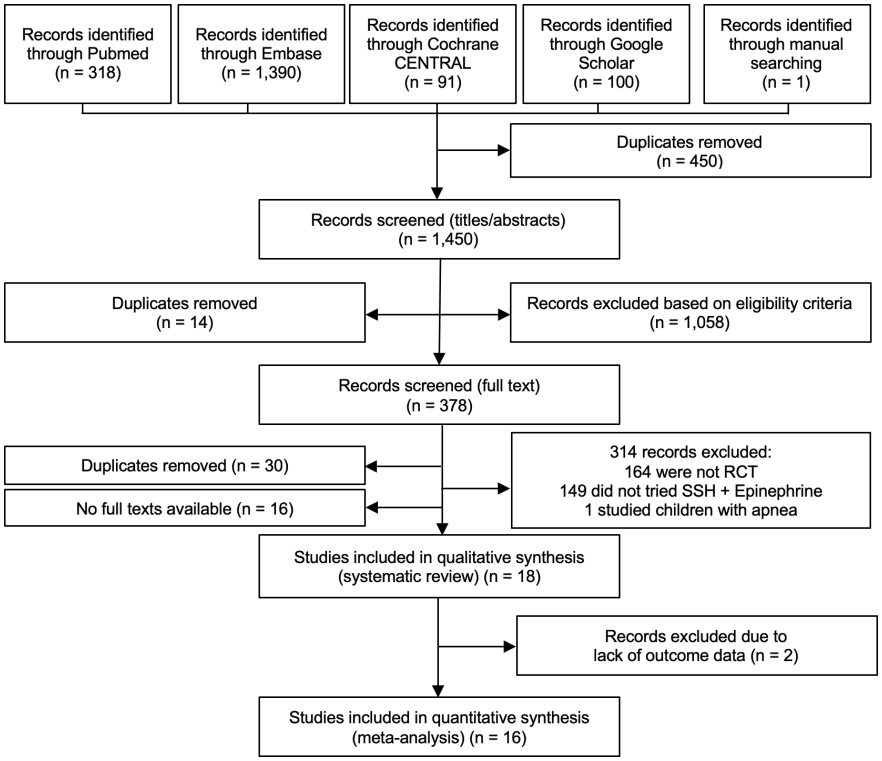
Abstract

Management of acute bronchiolitis remains controversial due to lack of strong evidence-based data. Nebulized epinephrine and hypertonic saline have been studied in infants with bronchiolitis, with conflicting results. This systematic review and meta-analysis aimed to evaluate the efficacy on length of stay (LOS), clinical severity scores (CSS), oxygen saturation (SaO2) and safety profile of nebulized epinephrine plus hypertonic saline (HS) in infants with acute bronchiolitis. Outcomes were represented by mean differences (MD) or standard mean differences (SMD) and 95% confidence intervals (CIs) were utilized. 18 trials were systematically selected and 16 of them contributed for the meta-analysis (1,756 patients). Overall, a modest but significant positive impact was observed of the combination therapy on LOS (MD of – 0.35 days, 95% CI -0.62 to -0.08, p = 0.01, I2 = 91%). Stratification by time of CSS assessment unveiled positive results in favor of the combination therapy in CSS assessed 48 hours and 72 hours after the admission (SMD of -0.35, 95% CI -0.62 to -0.09, p = 0.008, I2 = 41% and SMD of -0.27, 95% CI -0.50 to -0.04, p = 0.02, I2 = 0%, respectively). No difference in SaO2 was observed. Additional data showed a consistent safety profile, with a low rate of adverse events (1%), most of them mild and transient. In conclusion, nebulized epinephrine plus HS may be considered as a safe, cheap and efficient alternative for decreasing LOS and CSS in infants with acute bronchiolitis, especially on those who require more than 48 hours of hospitalization.

Hosted file

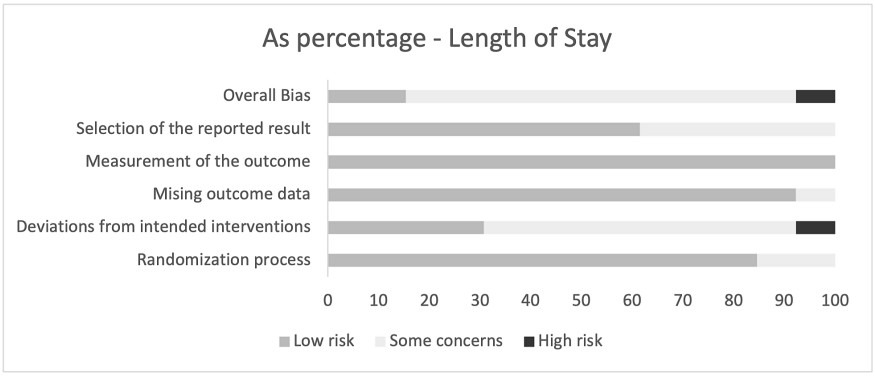
Effects of nebulized epinephrine in association with hypertonic saline for infants with acute bronchioli
available at https://authorea.com/users/414005/articles/522155-effects-of-nebulized-epinephrine-in-association-with-hypertonic-saline-for-infants-with-acute-bronchiolitis-a-systematic-review-and-meta-analysis

Posted on Authorea 16 May 2021 — The copyright holder is the author/funder. All rights reserved. No reuse without permission. — https://doi.org/10.22541/au.162113107.72098189/v1 — This a preprint and has not been peer reviewed. Data may be preliminary.

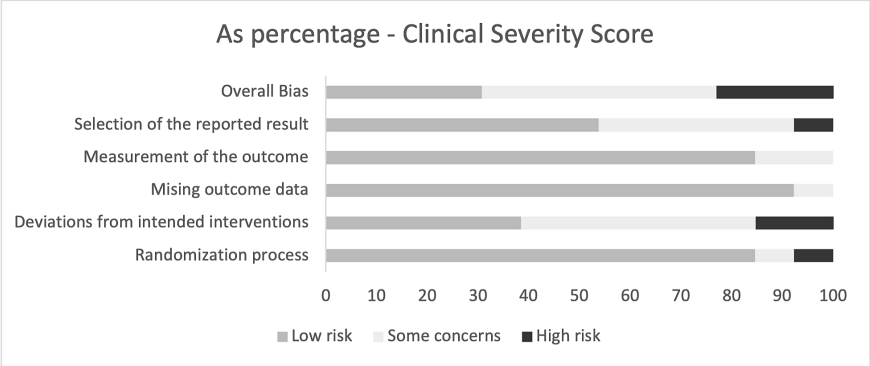


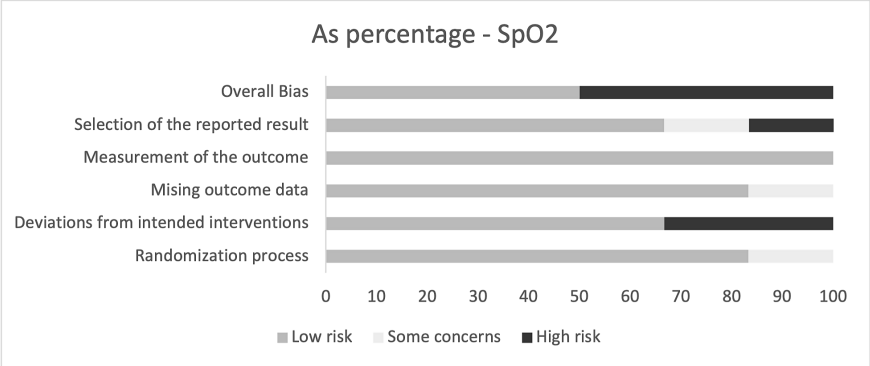
Hosted file

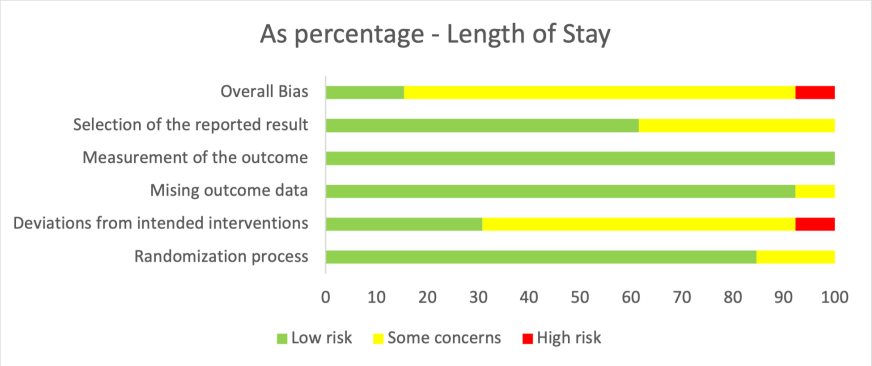
TABLE 1 Characteristics of included studies.pdf available at https://authorea.com/users/414005/articles/522155-effects-of-nebulized-epinephrine-in-association-with-hypertonic-saline-for-infants-with-acute-bronchiolitis-a-systematic-review-and-meta-analysis



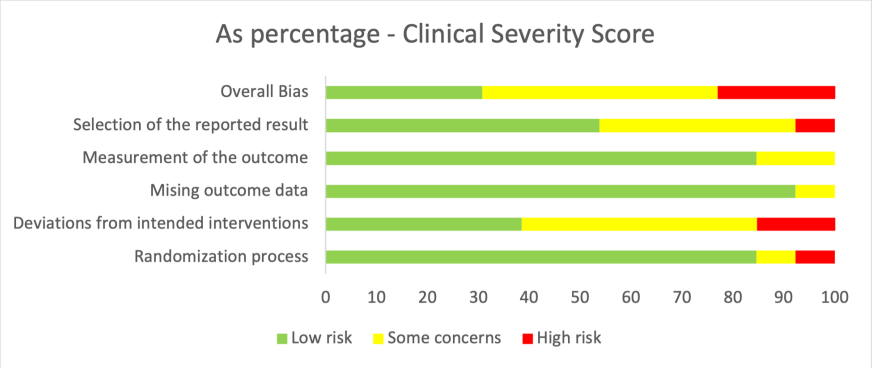
Posted on Authorea 16 May 2021 — The copyright holder is the author/funder. All rights reserved. No reuse without permission. — https://doi.org/10.22541/au.162113107.72098189/v1 — This a preprint and has not been peer reviewed. Data may be preliminary.

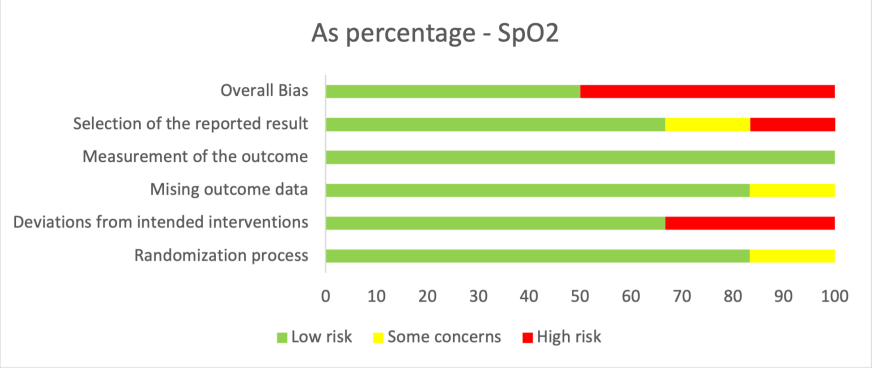


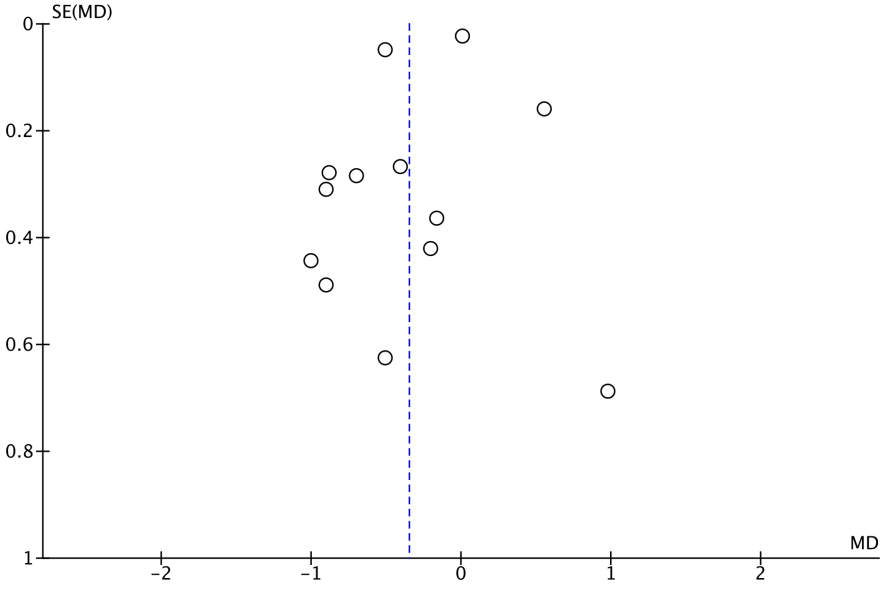




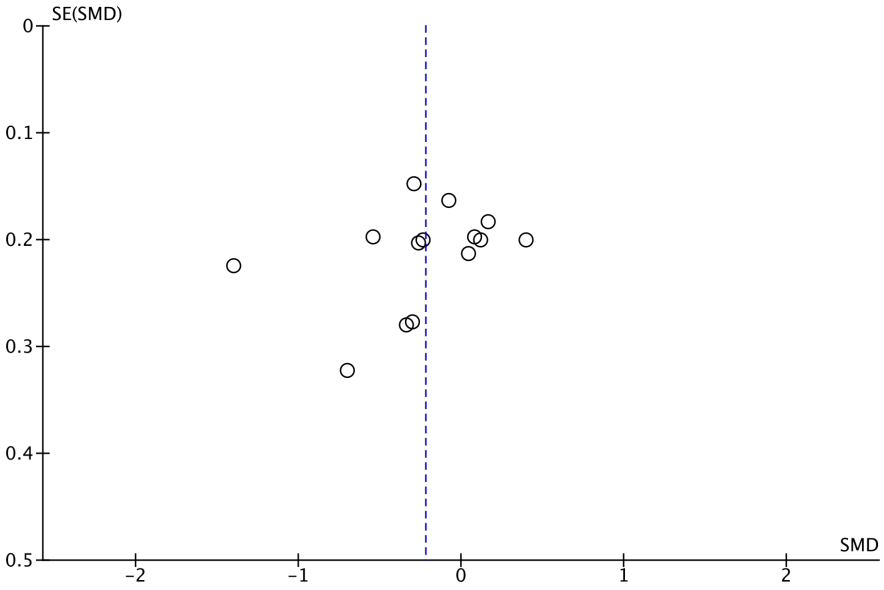
Posted on Authorea 16 May 2021 — The copyright holder is the author/funder. All rights reserved. No reuse without permission. — https://doi.org/10.22541/au.162113107.72098189/v1 — This a preprint and has not been peer reviewed. Data may be preliminary.





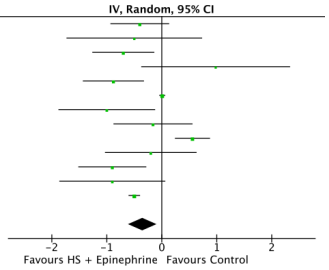


Posted on Authorea 16 May 2021 — The copyright holder is the author/funder. All rights reserved. No reuse without permission. — https://doi.org/10.22541/au.162113107.72098189/v1 — This a preprint and has not been peer reviewed. Data may be preliminary.



Study or Subgroup	SSH + Epinephrine Mean	SD	Total	Control Mean	SD	Total	Weight	Mean Difference IV, Random, 95% CI
Al-Ansari, 2010	1.48	1.39	115	1.88	1.76	56	8.7%	−0.40 [−0.93, 0.13]
Campaña, 2014	4.5	2.22	42	5	2.96	32	3.5%	−0.50 [−1.73, 0.73]
Del Giudice, 2012	4.9	1.3	54	5.6	1.6	52	8.4%	−0.70 [−1.26, −0.14]
Faten, 2014	4.48	3.81	36	3.5	1.973	57	3.0%	0.98 [−0.37, 2.33]
Flores-Gonzales, 2015	3.94	1.37	94	4.82	2.3	91	8.5%	−0.88 [−1.43, −0.33]
Jacobs, 2014	0.17	0.0037	52	0.162	0.166	49	13.1%	0.01 [−0.04, 0.05]
Mandelberg, 2003	3	1.2	27	4	1.9	25	5.5%	−1.00 [−1.87, −0.13]
Pandit, 2013	3.92	1.72	51	4.08	1.9	49	6.8%	−0.16 [−0.87, 0.55]
Reisi, 2018	1.841	0.604	90	1.283	0.796	30	11.2%	0.56 [0.25, 0.87]
Sharma, 2020	3.858	2.029	49	4.058	2.138	49	5.8%	−0.20 [−1.03, 0.63]
Sreenivasa, 2015	2.5	1.4	50	3.4	1.7	50	7.8%	−0.90 [−1.51, −0.29]
Tal, 2006	2.6	1.4	21	3.5	1.7	20	4.9%	−0.90 [−1.86, 0.06]
Uysalol, 2017	0.166	0.246	75	0.666	0.617	231	12.9%	−0.50 [−0.60, −0.40]
Total (95% CI)			**756**			**791**	**100.0%**	**−0.35 [−0.62, −0.08]**

Heterogeneity: $Tau^2 = 0.14$; $Chi^2 = 132.83$, df = 12 ($P < 0.00001$); $I^2 = 91\%$
Test for overall effect: Z = 2.56 (P = 0.01)



Hosted file

TABLE 2 LOS subgroup analysis.pdf available at https://authorea.com/users/414005/articles/522155-effects-of-nebulized-epinephrine-in-association-with-hypertonic-saline-for-infants-with-acute-bronchiolitis-a-systematic-review-and-meta-analysis

Posted on Authorea 16 May 2021 — The copyright holder is the author/funder. All rights reserved. No reuse without permission. — https://doi.org/10.22541/au.162113107.72098189/v1 — This a preprint and has not been peer reviewed. Data may be preliminary.