

Reduction of ileocolic intussusception under sedation or anesthesia: a systematic review of complications



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Background

Despite the increased use of sedation, ileocolic intussusception (RII) is usually performed on awake children in children undergoing stressful procedures, reduction of RII without any form of sedation.

Objective

To evaluate the incidence of severe complications of RII under sedation or anaesthesia.

Methods

Design A systematic review including English language original articles of any date.

Patients Children undergoing RII (pneumatic or hydrostatic) under sedation or anaesthesia.

Data sources Ovid Embase, Scopus, PubMed, the Cochrane Database of Systematic Reviews and the internet search engine Google Scholar.

Data extraction Three authors independently reviewed each article for eligibility. The Newcastle-Ottawa Scale was used to assess the quality of included studies.

Main outcome measures

The primary outcome was the incidence of intestinal perforation during RII.

The secondary outcomes were the incidence of sentinel adverse events defined as death, cardiopulmonary resuscitation, permanent neurological deficit and pulmonary aspiration syndrome.

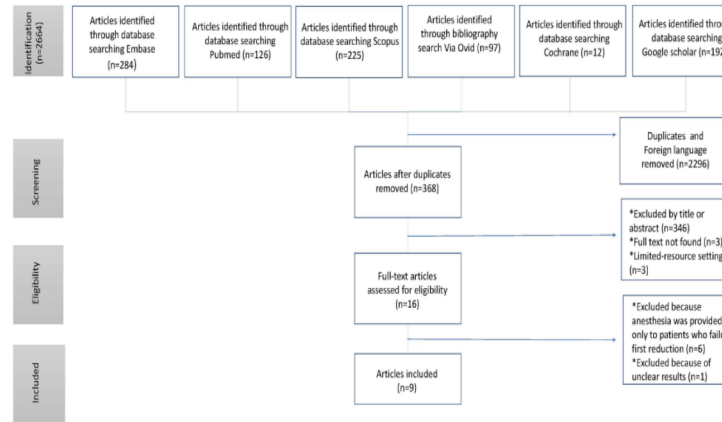


Figure 1 Preferred Reporting Items for Systematic Reviews and Meta-Analyses flow diagram.

Results

The search yielded 368 articles. Nine studies with 1391 cases were included in the analysis.

Of the nine studies, six had a score of ≤ 6 stars in the Newcastle-Ottawa Scale assessment, indicating low-to-moderate quality.

Propofol-based sedation was used in 849 (59.2%) cases; 5 (0.6%) had intestinal perforation. Intestinal perforation was not reported in patients who were sedated with other sedatives.

One patient had pulmonary aspiration syndrome.

Conclusions

Although caution remains warranted, current data suggest that the incidence of severe complications due to RII under sedation or anaesthesia is low. Due to the lack of prospective data, it is difficult to ascertain the exact incidence of severe complication.

Table 1 Characteristics and results of included studies

Study	Country	Setting	Number of cases	Age (months)	Reduction procedure	Medications	Rate of successful reduction (%)	95% CI (%)	Intestinal perforation cases reported	Sentinel adverse events*
Roth et al ¹	Poland	Radiology Department	27	Mean=21 SD not reported	Hydrostatic	Chloral hydrate 50mg/kg (per rectum)	23/27 (85.1)	67.5 to 94.1	None	
Ilivzli et al ²	Israel	Radiology Department	131	Not reported	Pneumatic	Propofol 1 mg/kg	121/131 (92.4)	86.5 to 95.8	2	One case of pulmonary aspiration, 3-month-old infant who received midazolam, with no deleterious consequences
Purenne et al ³	France	Operating room	337	Median=15 (Q1 not reported)	Pneumatic	Intravenous fentanyl or midazolam + atropine	285/337 (84.6)	80.3 to 88.0	None	
		Operating room	172	Median=17 (Q1 not reported)	Pneumatic	Induction: propofol 4-6 mg/kg + succinylcholine 1.5-2 mg/kg, tracheal intubation maintenance with propofol doses or sevoflurane 0.5-1 MAC	155/172 (90)	84.7 to 93.7	None	
Esposito et al ⁴	Italy	Radiology Department	144	Mean=14 SD not reported	Hydrostatic	Midazolam 0.5 mg/kg (maximum 15 mg oral or intranasal) + nitroglycerin and betamethasone	122/144 (85)	78.0 to 89.7	None	
van de Bunt et al ⁵	The Netherlands	Radiology Department	20	Mean=16 SD not reported	Hydrostatic	Ketamine 0.5-1 mg/kg + atropine 0.01 mg/kg	18/20 (90)	69.9 to 97.2	None	
Feldman et al ⁶	Israel	Radiology Department	124	Mean=14.7 SD=10.2	Pneumatic	Propofol loading bolus dose of 1 mg/kg or in combination with ketamine 1 mg/kg, midazolam 0.1-0.2 mg/kg or fentanyl 1-1.5 µg/kg, followed by propofol boluses of 0.5 mg/kg every 1-2 min	117/124 (94.4)	88.8 to 97.2	3	
Shavit et al ⁷	Israel	Radiology Department	14	Median=11 (Q1=4-20)	Pneumatic	Ketamine 1 mg/kg + propofol 1 mg/kg (9 patients); ketamine 2 mg/kg (5 patients); midazolam 0.1 mg/kg + ketamine 1 mg/kg (1 patient)	14/14 (100)	-	None	
Yeoh et al ⁸	Australia	Radiology Department	8	Not reported	Pneumatic	Midazolam intranasal/buccal 0.3-0.6 mg/kg or propofol 2-2.3 mg/kg or ketamine intravenous 2 mg/kg or nitrous oxide 70%	8/8 (100)	-	None	
Sadis et al ⁹	Israel	Operating room	414	Median=8 (Q1=5-12)	Hydrostatic	Propofol 2 mg/kg	356/414 (86.2)	82.3 to 89.0	None	

*Sentinel adverse events were defined as death, cardiopulmonary resuscitation, permanent neurological deficit and pulmonary aspiration syndrome.