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Interactive Distraction Techniques Versus Midazolam in Anxiolysis In Pediatric Patients: A Systematic Review and Meta-Analysis

Uzay Cagatay
Rowan University

Jon Elias
Rowan University

Alexander King
Rowan University

Virtua Health College of Medicine & Life Sciences of Rowan University

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Uzay Cagatay OMS-I, Jonathan Elias OMS-I, Alexander King D.O
Rowan-Virtua School of Osteopathic Medicine, Stratford, NJ

Objectives

- To compare the anxiolytic effects of Midazolam to using interactive distraction techniques in pediatric patients undergoing surgery.
- To determine whether the utilization of non-pharmacological methods of sedation are non-inferior to one of the currently most often used sedatives for pediatric surgery.

Methods

- A systematic review and meta-analysis were conducted following the 2020 PRISMA guidelines.
- Five online databases (Cochrane, Embase, PubMed, Web Of Science, Scopus) were screened.
- Included studies were those that measured the anxiety of pediatric patients utilizing the modified yale preoperative anxiety scale (mYPAS).
- 2 randomized controlled trials (RCT) fit our inclusion criteria and were included in the final analysis, yielding 217 distinct patient evaluations.

Results

- According to our analysis, the usage of Midazolam was more favorable. The Midazolam had a difference in effect size of Cohen's d = 0.21 in reducing preoperative anxiety in pediatric surgeries, compared to the utilization of interactive distraction techniques.

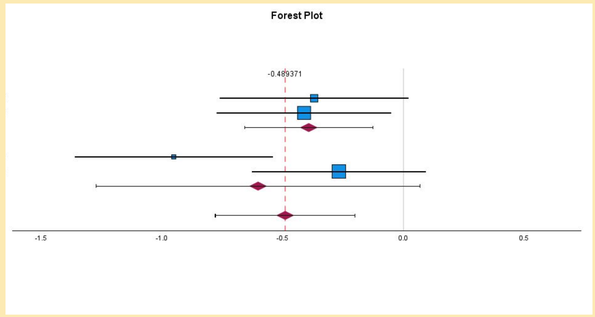

Figure 1. Forest plot portraying the effect size of comparing Midazolam to the Interactive Distraction.

Effect size of each study
Estimated overall effect size
No-effect value
Confidence interval of effect size
Overall effect size value
Estimated overall confidence interval

Group	ID	Cohen's d	Std. Error	Lower	Upper	p-value	Weight	Weight (%)
Active Distraction	Stewart et al.	-0.37	0.20	-0.76	0.02	0.06	11.22	24.36
	Merechal et al.	-0.41	0.18	-0.77	-0.05	0.03	12.01	26.07
	Subgroup Overall	-0.39	0.14	-0.66	-0.13	0.00		
0.3mg/kg Midazolam	Stewart et al.	-0.95	0.21	-1.36	-0.54	0.00	10.76	23.37
	Marechal et al.	-0.27	0.18	-0.63	0.09	0.14	12.06	26.20
	Subgroup Overall	-0.60	0.34	-1.27	0.07	0.08		
Overall		-0.49	0.15	-0.78	-0.20	0.00		

Model: Random-effects model
Heterogeneity: Tau-squared = 0.05, H-squared = 2.31, I-squared = 0.57
Homogeneity: Q = 6.86, df = 3, p-value = 0.08
Test of overall effect size: z = -3.32, p-value = 0.00
Test of between-subgroup homogeneity: Q = 0.33, df = 1, p-value = 0.57

Figure 2. The data obtained from the forest plot analysis.

Discussion

- The interactive distraction techniques achieved clinically non-inferior anxiolysis in pediatric patients compared to the 0.3 mg/kg midazolam.
- The omission of Midazolam from the preoperative anesthetic cocktail could have a variety of beneficial effects. Although it used very commonly in the preoperative setting, Midazolam has a variety of side effects such as nausea and emergence delirium.

Conclusion

- There was no statistically significant difference in anxiolysis between Midazolam and interactive distraction.
- Our review had a low clinical difference in effect size. The difference in Cohen's d = 0.21 suggests that the Midazolam had a positive effect on pediatric preoperative mYPAS scores.

Study Limitations

- A limitation of our study is the relatively small sample size of 217 pediatric patients.
- Future randomized control trials with more modern interactive distraction techniques may be beneficial in reassessing the anxiolytic role that such techniques may have.

Search String

("Active Distraction" OR "Interactive Distraction" OR "tablet-based interactive distraction") AND ("Midazolam")

References

Marechal C, Berthiller J, Tosetti S, et al. Children and parental anxiolysis in paediatric ambulatory surgery: a randomized controlled study comparing 0.3 mg kg-1 midazolam to tablet computer based interactive distraction. *Br J Anaesth*. 2017;118(2):247-253. doi:10.1093/bja/aew436

Stewart B, Cazzell MA, Pearcy T. Single-Blinded Randomized Controlled Study on Use of Interactive Distraction Versus Oral Midazolam to Reduce Pediatric Preoperative Anxiety, Emergence Delirium, and Postanesthesia Length of Stay. *J Perianesth Nurs*. 2019;34(3):567-575. doi:10.1016/j.jopan.2018.08.004