Clonidine for Dexmedetomidine Withdrawal in Pediatric Patients: A Single Center's Experience

J Pediatr Pharmacol Ther 2019;24(6):542–543

DOI: 10.5863/1551-6776-24.6.542

Recent evidence suggests that up to 80% of patients receiving dexmedetomidine (DEX) have withdrawal symptoms. Some have hypothesized that DEX withdrawal could be diminished by administration of clonidine, an oral medication with a similar mechanism of action.^{1–3} To date, there are 2 studies that have found no benefit of clonidine.^{2,3}

We retrospectively analyzed consecutive pediatric patients treated with DEX for ≥ 48 hours. This project was exempt from review by our institutional review board. Patients were excluded if they expired, were transferred to other facilities while on DEX, or if they had no documented height. DEX withdrawal was defined as 2 consecutive episodes of hypertension or tachycardia, or nursing documentation of agitation. Descriptive statistics were used, and statistical tests included either the χ^2 , Fisher exact, or Mann-Whitney U test.

One hundred fifteen patients were included, of which 27 received clonidine. Patient demographics and DEX treatment characteristics in patients treated with and without clonidine are depicted in the Table. The median

clonidine dose was 4.5 mcg/kg/day (range of 1.4–18.8 mcg/kg/day).

Patients given clonidine received longer DEX infusions, spent more time at the maximum DEX dose, and had a longer length of DEX taper. Withdrawal symptoms occurred in 71.6% and 63% of patients not receiving and receiving clonidine, respectively ($p = 0.394$). When further stratified by individual symptoms of withdrawal, there were no significant differences in tachycardia, hypertension, or agitation.

Our results suggest that clonidine may not diminish the symptoms of DEX withdrawal. There was more than a 13-fold variation in clonidine dosing between the smallest and largest doses used. This is consistent with investigators who reported > 6 -fold variation between smallest and largest doses of clonidine.^{2,3} This literature and our results suggest the optimal clonidine dose to diminish symptoms of DEX withdrawal has yet to be identified. Gagnon et al⁴ proposed that most adults can be transitioned off DEX within 24 to 48 hours of initiating clonidine (0.3 mg every 6 hours). This transition time is

Table. Patient Demographics and Dexmedetomidine Treatment Characteristics

	Clonidine (n = 27)	Without Clonidine (n = 88)	p value
Patient demographics			
Male sex, n (%)	11 (40.7)	48 (54.5)	0.209
Age (mo), median (IQR)	36.0 (8.0–180.0)	22.0 (7.0–96.0)	0.167
Weight (kg), median (IQR)	15.85 (8.43–47.25)	11.2 (6.53–25.55)	0.119
Height (m), median (IQR)	0.95 (0.64–1.52)	0.82 (0.62–1.21)	0.147
Dexmedetomidine treatment characteristics			
Duration of therapy (days), median (IQR)	13.5 (6.75–22.0)	5.0 (3.0–10.0)	< 0.001
Maximum dose (mcg/kg/hr), median (IQR)	0.90 (0.68–1.05)	0.80 (0.60–1.20)	0.588
Time at maximum dose (hr), median (IQR)	96.0 (36.0–171.0)	47.0 (24.0–76.0)	0.002
Length of taper (hr), median (IQR)	48.0 (36.0–72.0)	24.0 (12.0–48.0)	< 0.001
Other sedative taper, n (%)	7 (25.9)	29 (33)	0.491
PICU length of stay (days), median (IQR)	23.5 (14.75–36.25)	10.0 (8.0–20.0)	< 0.001
Dexmedetomidine withdrawal symptoms, n (%)			
Agitation	7 (25.9)	11 (12.5)	0.525
Hypertension	16 (59.3)	48 (54.5)	0.666
Tachycardia	5 (18.5)	28 (31.8)	0.561

IQR, interquartile range

similar to our study and suggests an optimal dose could be identified in pediatric patients. We encourage others who investigate clonidine use in intubated pediatric patients on DEX to focus on determining an effective dose versus simply investigating the frequency of withdrawal symptoms.

Erin R. Beitz, PharmD
Robert Seabury, PharmD, DABAT
Christopher D. Miller, PharmD
William Q. Darko, BSPHarm, PharmD
Luke A. Probst, PharmD
Kelly E. Steidl, PharmD

ARTICLE INFORMATION

Affiliations Pharmacy (ERB, RS, CDM, WQD, LAP, KES), SUNY Upstate University Hospital, Syracuse, NY

Correspondence Erin R. Beitz, PharmD; beitze@upstate.edu

Disclosure The authors declare no conflicts or financial interest in any product or service mentioned in the manuscript, including grants, equipment, medications, employment, gifts, and honoraria. The authors had full access to all the data and take responsibility for the integrity and accuracy of the data analysis.

Accepted August 19, 2019

Copyright Published by the Pediatric Pharmacy Association. All rights reserved.

For permissions, email: mhelms@pediatricpharmacy.org

REFERENCES

1. Banasch HL, Dersch-Mills DA, Boulter LL, et al. Dexmedetomidine use in a pediatric intensive care unit: a retrospective cohort study. *Ann Pharmacother*. 2018;52(2):133–139.
2. Lardieri AB, Fusco NM, Simone S, et al. Effects of clonidine on withdrawal from long-term dexmedetomidine in the pediatric patient. *J Pediatr Pharmacol Ther*. 2015;20(1):45–53.
3. Haenecour AS, Seto W, Urbain CM, et al. Prolonged dexmedetomidine infusion and drug withdrawal in critically children. *J Pediatr Pharmacol Ther*. 2017;22(6):453–460.
4. Gagnon DJ, Riker RR, Glisic EK, et al. Transition from dexmedetomidine to enteral clonidine for ICU sedation: an observational pilot study. *Pharmacotherapy*. 2015;35(3):251–259.