

Buprenorphine for the Treatment of Neonatal Abstinence Syndrome

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Background

Opioid use is on the rise, leading to increased rates of neonatal abstinence syndrome (NAS).¹

A survey from the Better Outcomes through Research for Newborns (BORN) network hospitals revealed that while most institutions have a protocol for the treatment of NAS, the protocols vary across the country.²

A recent study from Thomas Jefferson University compared sublingual buprenorphine to morphine for NAS treatment, and concluded that buprenorphine decreased both duration of pharmacologic therapy and length of stay for NAS, with a similar adverse effect profile.³ When compared to methadone, retrospective studies also suggest that buprenorphine is superior.⁴

A key issue with buprenorphine is that it is compounded as a 30% ethanol solution. Pharmacokinetic studies of alcohol in neonates declared that until more data is available, we should minimize the use of alcohol-containing medications and evaluate the risk-benefit before use.⁵

There is no consensus with regard to a preferred pharmacologic treatment for NAS.

Objectives

The objective of this study is to determine first line treatments for neonatal abstinence syndrome within neonatal intensive care units.

Secondary objectives are to determine the usage of buprenorphine for NAS and barriers for use of this agent.

Methods

This is a prospective survey of convenience.

A 16-item online survey was created to identify an institution's neonatal intensive care unit (NICU) demographics, their protocol for the treatment of NAS, usage of buprenorphine in NAS patients, and concerns with using buprenorphine in neonates.

Pharmacists were identified through the Pediatric Pharmacy Advocacy Group listserv. Pharmacists registered for only the neonatology special interest group or neonatology plus one additional special interest group received the survey via email.

Results were collected through SurveyMonkey© and analyzed for trends.

Results

Table 1. Demographics

Variable	Responses	N (%)
Type of Hospital	Stand Alone	8 (33.3)
	Children's Hospital in Academic Medical Center	10 (41.7)
	Children's Hospital within Community Hospital	6 (25)
Location of Hospital by Region	Northeast	3 (12.5)
	Southeast	13 (54.1)
	Midwest	6 (25)
	Southwest	1 (4.2)
	West	1 (4.2)
Number of NICU Beds	14-40	6 (25)
	41-60	10 (41.7)
	61-80	5 (20.8)
	81-100	0 (0)
	> 100	3 (12.5)
NICU Level of Care	Level I	0 (0)
	Level II	1 (4.2)
	Level III	9 (37.5)
	Level IV	14 (58.3)
NICU Admissions per Month	< 10	0 (0)
	10-49	12 (50)
	50-89	7 (29.2)
	> 90	5 (20.8)
	NAS Admissions per Month	0
1-2		9 (37.5)
3-5		10 (41.2)
6-10		3 (12.5)
> 10		2 (8.3)

- 24 complete responses received from distinct institutions (19.8% response rate).
- Morphine is the most common first line of therapy for NAS, reported by 83% of respondents.
- Finnegan Neonatal Abstinence Scoring Tool is most commonly used for monitoring treatment, reported by 96% of respondents.
- Only two respondents reported having used buprenorphine to treat NAS at their institution; one institution implemented buprenorphine as first line in January 2018.

Conclusion

Our results indicate that morphine (or diluted morphine) is still the most frequently used treatment for NAS. Only one responding institution has implemented buprenorphine as first line pharmacotherapy at this time. In order for buprenorphine's place in therapy to move up, more data and an alcohol-free product are needed.

References

1. Brown JD, Doshi PA, Pauly NJ, Talbert JC. Rates of Neonatal Abstinence Syndrome Amid Efforts to Combat the Opioid Abuse Epidemic. *Journal of the American Medical Association Pediatrics*. 2016; 170:1110-1112.
2. Bogen DL, Whalen BL, Kair LR, Vining M, King BA. Wide Variation Found in Care of Opioid-Exposed Newborns. *Elsevier*. 2017; 17:374-380.
3. Kraft WK, Adeniyi-Jones SC, Chervoneva I, Greenspan JS, Abatemarco D, Kaltenbach K, Ehrlich, ME. Buprenorphine for the Treatment of the Neonatal Abstinence Syndrome. *The New England Journal of Medicine*. 2017; 337:996-998.
4. McPherson C. Pharmacotherapy for Neonatal Abstinence Syndrome: Choosing the Right Opioid or No Opioid at All. *Neonatal Network*. 2016; 35:314-320.
5. Marek E, Kraft WK. Ethanol Pharmacokinetics in Neonates and Infants. *Elsevier*. 2014; 76:90-97.

Disclosures:
Authors have nothing to report.

Figure 1. First Line Pharmacotherapy for Neonatal Abstinence Syndrome

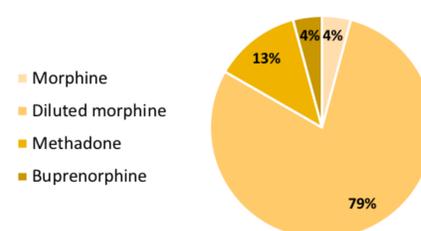


Figure 2. Barriers to Buprenorphine Use

