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Case Report

Neonatal Dhatura like poisoning - A premedication error in neonatal anesthesia

Nirupama Tyagi[1,*], S S Bisht[2], Anil Saini[2], Amita Tyagi[2], Anand Agarwal[2], Lalit Gupta[3]

[1]*Dept. of Pediatrics, Perfect Tyagi Hospital and Indian Red Cross Hospital, Dilshad Garden, Delhi, India*
[2]*Dept. of Pediatrics, Swami Dayanand Hospital, Dilshad Garden, Delhi, India*
[3]*Dept. of Anesthesiology, Maulana Azad Medical College(MAMC), Delhi, Delhi*

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ABSTRACT

Overdosing of drugs sometimes produce fatal consequences. We report such a case of premedication dosing error in neonates with Glycopyrrolate leading to central anticholinergic syndrome (CAS) as in Dhatura poisoning. Accidental overdosing with glycopyrrolate resulted in symptoms like tachycardia, tachypnea, shock, hyperpyrexia, irritability and excessive crying. These symptoms resolved with symptomatic treatment.

Errors can occur at any step of the path from drug prescription to administration. Medication errors are common and it should be immediately suspected in neonates with abnormal symptoms after injecting some drug, so that early diagnosis and treatment can be started timely. Identifying such medication errors is a challenge in neonatal care and should be a priority among caregivers in order to prevent future incidents and for patients' safety.

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1. Case Report

25 days old, 3.75 Kg male baby underwent lid surgery (adhesiolysis for symblepharon). He was given Ketamine 4.0mg and glycopyrrolate 0.1 mg (recommended dose: 4-8 mcg/kg) as pre-anaesthetic medication for antisialogogic action. Baby immediately had a tonic clonic convulsion, which responded on giving Inj. Midazolam(0.1mg/kg, IV). Heart rate was more than 200/min. Pulses were feeble, thready, and skin was mottled. Blood pressure was not recordable by non invasive BP monitor. Pupils were dilated and baby was crying excessively, irritable and febrile (temp 39^0C). Bladder was palpable till umbilicus. Surgery was deferred in view of above condition.

Baby was immediately given normal saline boluses, followed by Dobutamine infusion. HR increased to 250/min. ECG showed sinus tachycardia. After giving digoxin and hydrotherapy, HR decreased to 200/min. Dobutamine was tapered and stopped in 1 hour and neonate shifted to Neonatal ICU for observation. Feeds were gradually restarted. Tachycardia resolved over next three days. Patient was discharged after 4 days of hospital stay.

2. Introduction

Medication errors are common but under recognized, in primary care settings where neonatal surgeries are not commonly performed.

2.1. Neonatal anesthesia

Sometime ago, few scientists and healthcare providers believed that infants and young children were unable to localize and/or perceive painful stimuli. Today we know

* *Corresponding author*.
E-mail address: drnirupamatyagi@gmail.com (N. Tyagi).

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Table 1:

Medication	Dosage	Onset of Action	Duration of Action	Common Adverse Effects [1]
Atropine	10-20 mcg/kg	1-2 min	30-120 min	Tachycardia, dry hot skin
Glycopyrrolate	5 mcg/kg	1-10 min	360 min	Tachycardia, arrhythmias, Bronchospasm

well that newborn can localize and perceive pain from 26-28 weeks of gestation. Now infants routinely receive analgesia and sedation for surgical procedures in the operating room, but the extent to which infants routinely receive medication for other painful procedures varies. In 2016, the American Academy of Pediatrics (AAP) recommended that premedication be used for all intubations in neonates, except in the case of emergent intubation during resuscitation.[2] The goal of premedication is to eliminate pain, discomfort, traumatic injury to the airway, and physiologic instability (e.g., bradycardia, hypotension/hypertension, decreased oxygen saturation) associated with endotracheal intubation procedure. Vagolytic agents help prevent reflex bradycardia during intubation because of an exaggerated vagal response and decrease oral and bronchial secretions. Atropine and glycopyrrolate are the most commonly administered vagolytic agents.[3]

2.2. Glycopyrrolate: Indications and usage

Glycopyrrolate is indicated for use as a preoperative antimuscarinic to reduce salivary, tracheobronchial, and pharyngeal secretions; to reduce the volume and free acidity of gastric secretions; and to block cardiac vagal inhibitory reflexes during induction of anesthesia and intubation. It may be used intraoperatively to counteract surgically or drug-induced or vagal reflexes associated arrhythmias.

2.3. Dosage and administration

Glycopyrrolate Injection may be administered intramuscularly, or intravenously.

Pediatric dose is 0.004 mg/kg intravenously, maximum 0.1 mg in a single dose which may be repeated, at intervals of 2 to 3 minutes. The another safe alternative is atropine in children.[1] (Table 1)

2.4. Overdosage

1. CNS symptoms - excitement, restlessness, psychosis, ataxia, hallucinations, convulsion, coma
2. Neuromuscular blockade leading to muscular weakness and possible paralysis. Respiratory muscle paralysis can also occur.
3. Dryness of the skin and mouth, dermal flushing,
4. Fever, abdominal distention,
5. Urinary retention, feeding intolerance,
6. Tachycardia with normal blood pressure, arrhythmia, hypotension

2.5. Management of toxicity

1. Mainly symptomatic.
2. Specific antidote is Physostigmine.[4]
3. Physostigmine infusion with a dose of 0.02 mg/kg (maximum of 0.5mg/dose) over 3 minutes is recommended in infants/children (before infusion, conduction abnormalities e.g., PR, QRS, or QTc interval prolongation should be checked).

3. Conclusion

1. Neonatal Dhatura (atropine–like) poisoning needs to be suspected in babies who show postoperative or per operative deterioration in case premedication with atropine or glycopyrrolate is done. The possibility of central anticholinergic syndrome (CAS) should be considered with post-operative flushing, mydriasis, dry skin and mucous membranes, altered mental status or fever.
2. The American Academy of Pediatrics (AAP) suggests that when choosing premedication, medications with rapid onset and a short duration of action are preferred. Thus, the AAP-preferred vagolytic agent is atropine because of the rapid onset and shorter duration of action compared to glycopyrrolate.
3. Physostigmine, a tertiary amine, should be available in the operating room for treatment of central anticholinergic syndrome (CAS).

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5. Conflict of Interest

The author declares no conflict of interest.

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Author biography

Nirupama Tyagi, Consultant Pediatrics

S S Bisht, Head Neonatology Division

Anil Saini, Consultant Pediatrician

Amita Tyagi, HOD

Anand Agarwal, Consultant Pediatrician

Lalit Gupta, Associate Professor

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