

Neonatal seizures treatment protocol in a tertiary hospital: real-world use of lidocaine after protocol implementation

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Background and importance

Neonatal seizures are a frequent and challenging condition in neonatal intensive care units (NICUs), due to their diverse etiologies and variable response to pharmacological treatment. Phenobarbital and levetiracetam are standard first- and second-line treatments. Recent evidence supports lidocaine as an effective third-line option for refractory seizures. Based on these findings, lidocaine was incorporated into our hospital's protocol in June 2022. Despite its therapeutic potential, clinical experience with lidocaine remains limited and underreported.

Aim and objectives

To describe the pharmacological management of neonatal seizures in our NICU and assess the effectiveness and safety of lidocaine after its inclusion in the treatment protocol.

Material and methods

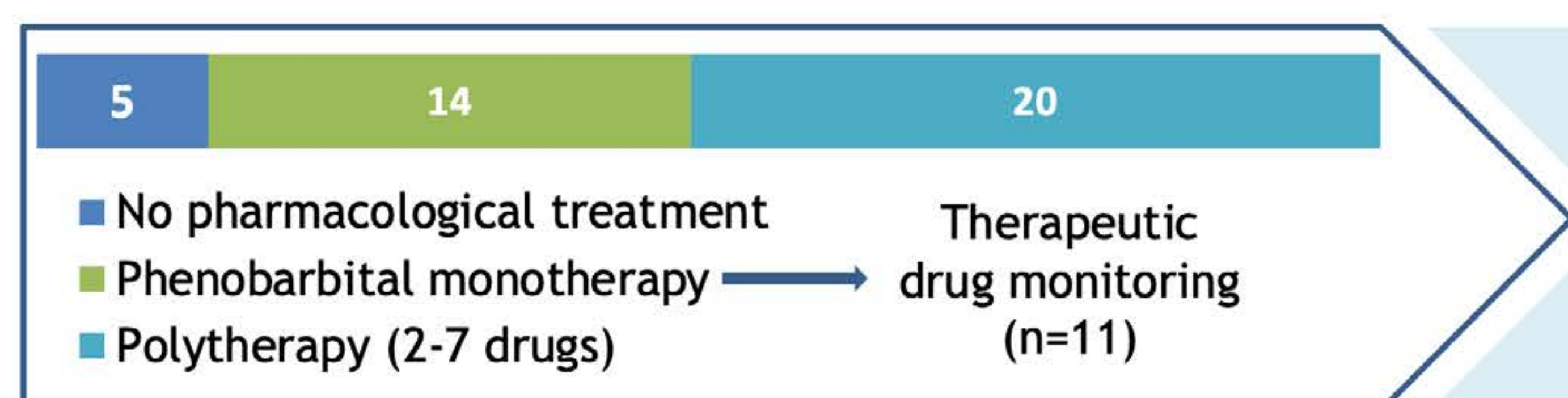
A retrospective study was conducted in a tertiary hospital from December 2019 to November 2024. All neonates admitted to the NICU with a diagnosis or suspicion of seizures were included. Data collected included demographics, seizure etiology, pharmacological treatments, therapeutic drug monitoring (TDM), therapeutic hypothermia, treatment at discharge and outcomes.

Results

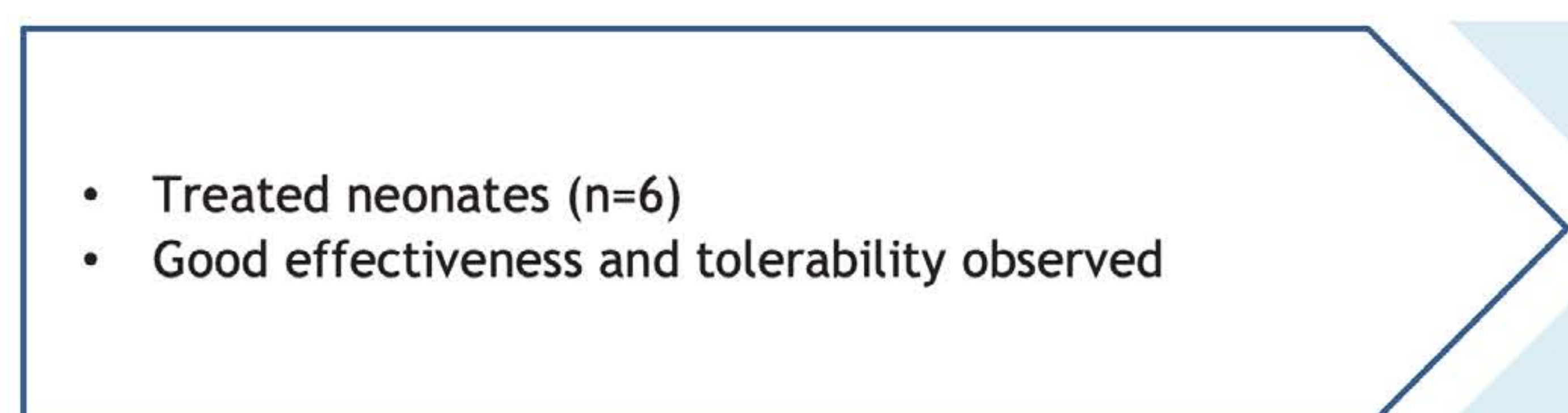
Study population

- ♦ 39 neonates included
 - 19 pre-protocol / 20 post-protocol
- ♦ Birth weight (\bar{x}): 3.1 ± 0.56 kg
- ♦ Gestational age (\bar{x}): 39 ± 2 weeks
- ♦ Female: 24 (62%)
- ♦ Therapeutic hypothermia: 11 cases

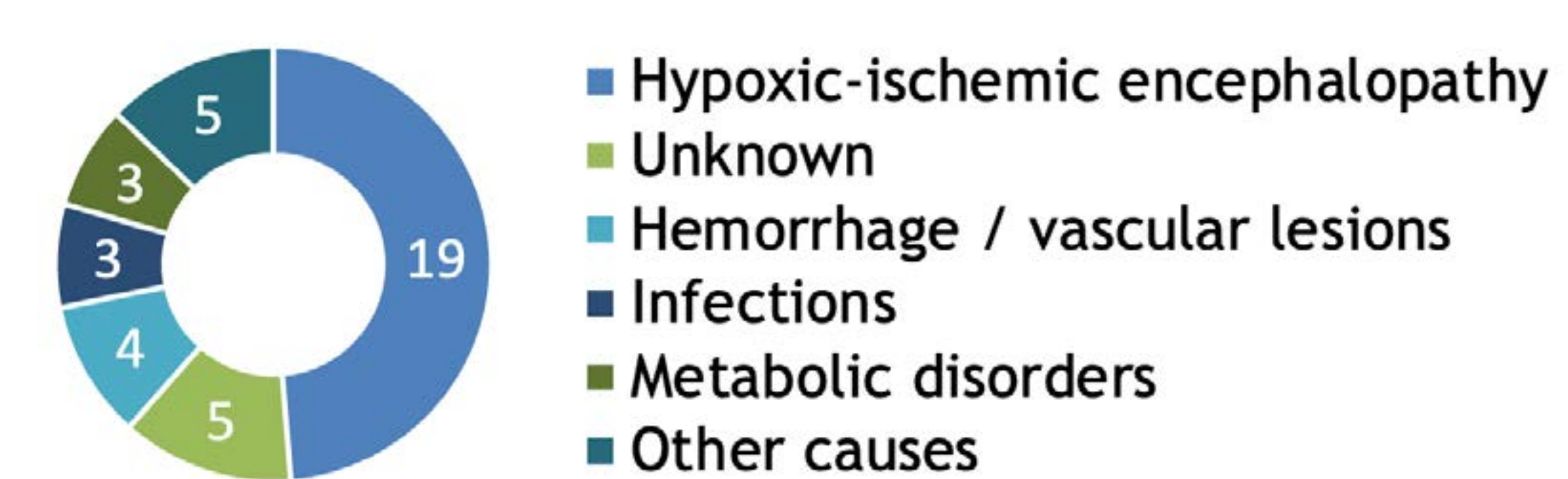
Antiseizure treatment



Lidocaine use (post-protocol)



Etiology



Status at discharge

Medication-free (n=15)
 Monotherapy (n=10)
 Dual therapy (lacosamide + oxcarbazepine) (n=1)
 Transferred to other centers (n=4)
Deaths (n=4)

Outcomes

Discharged on lacosamide/oxcarbazepine → **Seizure-free, treatment stopped (n=2)**
 Stepped down from dual therapy to valproate monotherapy (n=1)
 Transferred (n=1)
Deaths (n=2)

Conclusion and relevance

- ♦ Phenobarbital remains the first-line therapy in our NICU, followed by levetiracetam. Lidocaine has proven to be an effective and safe third-line therapy for refractory neonatal seizures.

