Delirium - Does it Matter to Children

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• Within the last 12 months I have not had any type of financial arrangement or affiliation with commercial interests related to the content of this continuing education activity that requires disclosure
Delirium - a Pediatric Perspective

CHALLENGES IN PEDIATRICS

IS DELIRIUM IMPORTANT IN CHILDREN

WHAT DOES IT LOOK LIKE IN CHILDREN

WHAT DOES IT FEEL LIKE TO CHILDREN

Video Testimonials

#WDAD2018

I am Delirium Aware

14 March 2018

@DeliriumCare

Patient & Family Report: Memories from the ICU

Patient & Family Report: Life following critical illness

Delirium in the ICU
@ICU_delirium

THE FOLLOWING VIDEO HAS BEEN APPROVED FOR ALL HOSPITAL AUDIENCES

BY THE MOTION PICTURE ASSOCIATION OF AMERICA, INC.

THE VIDEO HAS BEEN RATED

D FOR DELIRIUM
SCENES OF DELIRIUM
ZOMBIES, SPIDERS, NIGHTMARES, VAMPIRES
Delirium in the PICU

Perceptions of Delirium in children:

- “we just don’t see it in kids”
- “Doesn’t affect infants and young children”
- “Not a big problem”
- “Doesn’t last very long”
- Not important

RN Report: “WAT-1 = 2, CAPD = 13”
- “Doesn’t affect infants and young children”

MD Impression: “patient is withdrawing”
- “Not a big problem”

Plan: “increase midazolam infusion”
- “Doesn’t affect infants and young children”
- Not important

Suspect withdrawal if

\[ WAT-1 \geq 3 \]

Suspect Delirium if

\[ CAPD \geq 9 \]

4 mth old male, bronchiolitis

PICU Liber8 study (unpublished)
Challenge 1: Knowledge Gap

- 93% comfortable with assessing Sedation & Withdrawal
- Uncomfortable with Delirium assessment
  - 60% don't know how
  - Regular PD screening in only 2% PICUs

- Lack of Knowledge
  - Only 30% aware there are different types of delirium
  - Lack of awareness of risk factors
  - Unclear which scoring tool to use

Choong et al, PICULiber8 study (NCT03573479); D Long, Australian Critical Care 2016; Kudchadkar S, CCM 2014
Nurses perceptions of PICU Delirium:

- 38% - benzodiazepines are beneficial for treatment
- 13% - a urinary catheter can reduce delirium
- 43% - delirium is short lived, lasts hours
- 62% - children don’t remember being delirious
Challenge 2: Culture of Sedation

• Conflicting attitudes - staff understand the need for reducing sedation, yet desire deeper sedation

• Perceived ↑workload, safety concerns with less sedation

Choong et al, PCCM 2014; PICULiber8 (NCT03573479)
Challenge 3: Lack of MD initiative

- Lack of investment of the MD –
  - 61% never or rarely discuss delirium during rounds
  - no urgency to address/treat

- MD’s more likely to address delirium when a known assessment tool is used on a regular basis

Choong et al, PCCM 2014; Long, Australian Critical Care 2016; Cooper Flaigle, J Ped Nursing 2016
Adult ICU Evidence: more than 50 studies, 5 RCTs and 5 SR’s in 5 years
Validated PICU Delirium tools; pCAM-ICU(2011), CAPD (2014)
Challenge 4: Diagnosis

Fig. 1 Overlap of behavioural cues in pain, sedation, withdrawal syndrome and delirium

© M. van Dijk, 2011
Pediatric Screening Tools

- **PAIN**: FLACC
  - Sensitivity: 95%
  - Specificity: 73%

- **WITHDRAWAL**: WAT-1
  - Sensitivity: 88%
  - Specificity: 87%

- **AROUSAL STATE**: RASS
  - $\kappa > 0.8$
  - $\rho = 0.81$

- **DELIRIUM**: CAPD
  - Sensitivity: 94%
  - Specificity: 79%
Challenge: Delirium vs Withdrawal?

- Iatrogenic Withdrawal: 37-77%
- Delirium: 20-35%

**Event rate, per 100 patient days**

**DELIRIUM**
18.4

**Withdrawal**
3.9

PICU Liber8 study, McMaster (unpublished data)

Duceppe M, J Clin Pharm Ther 2019; Traube C, PCCM 2017
IS DELIRIUM IMPORTANT IN CHILDREN?

PUTTING IT IN PERSPECTIVE
Delirium is just as big of a problem in KIDS as it is in ADULTS

- Prevalence: 25% (95% CI 23-27%)
- Median no. days of delirium: 2 (1-4)
- Time to delirium: 3 (2-6) days

Prevalence in ADULTS: 16-89%

Sedation and Delirium in the Intensive Care Unit

Michael C. Reade, M.B., B.S., D.Phil., and Simon Finfer, M.D.

Rood P, J Crit Care 2019; Krewulak K, CCM 2018
Delirium is **Common** in Critically ill Children

- Incidence *increases with time*
- Delirium can be **recurrent**: 21% (2-14 episodes)
- Delirium is very common in subgroups:
  - mechanically ventilated children (55%)
  - Cardiac ICU (57%)
  - Post-operative (66%)
  - ECMO patients (100%)

*Simone et al, PCCM 2017; Traube et al, CCM 2017*
“Delirium doesn’t affect infants and young children”

Key Risk Factors for PICU Delirium

1. **Young age**: 56% children with delirium are < 2 y, 46% < 12 months
2. **Developmental delay**: OR 3.4  
   ➢ 59% prevalence
3. **Depth of Sedation**
4. **Type of Sedation** - Benzodiazepines
Causal associations with DELIRIUM

• Benzodiazepines
  → Quadruples the risk of delirium vs. Opiates
  → Time and dose dependent effect

• Anticholinergics
  → Median anticholinergic drug score in children = 8 vs adults = 2

Madden, PCCM 2018; Mody K CCM, 2018
RBC transfusion increases the risk of Pediatric Delirium

- RBC transfusion increases risk of Delirium (OR 2.16)
- Anemia was not associated with delirium
- Dose response - for increasing **volume** and **No.** of RBC transfusions
- ↑ Risk by **27%** for each additional transfusion
Is Delirium important in Children

Patient Outcomes
Delirium: PICU Outcomes

- Longer PICU LOS (23%, p < 0.001)
- Longer mechanical ventilation (OR 4.1)
- Increased risk of Death (OR 4.4)
- Increased Cost by 85% ($19k vs $5k USD)
- Increased Nursing Workload
Outcomes prioritized by Patients and Families following critical illness:

- Increased Length of stay
- Poor Functional outcome
- Increased Parental Stress
- Functional outcome
- Quality of Life
- Psychological and social Support

Choong, AJRCC 2016; Merrit, PCCM 2016
<table>
<thead>
<tr>
<th>Outcome</th>
<th>Findings</th>
</tr>
</thead>
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| **Psychological Outcomes:**  | • 33% have persistent delusions, hallucinations  
• 35-62% PTSD symptoms       
• 20% at risk of general psychiatric disorder (depression, conduct disorder, hyperactivity) |
What does Delirium look like in Critically ill Children

Dream Collector series, Arthur Tress
Delirium Subtypes

**ADULTS**
- Hypoactive: 50%
- Hyperactive: 14%
- Mixed: 36%

**PEDIATRICS**
- Hypoactive: 47%
- Hyperactive: 45%
- Mixed: 8%
- Non hyper/hypo (RASS=0): 8%

**INFANTS/PRESCHOOLERS**
- Hypoactive: 70%
- Hyperactive: 22%

- Under-reported
- 75% of missed delirium
- Associated with worse outcomes

Delirium Subtypes

INFANTS/PRESCHOOLERS

- **Hypoactive** 70%
- **Hyperactive** 22%
- **Non hyper/hypo (RASS=0)** 8%

- WAT-1 = 2, CAPD = 13
- Impression: **DELIRIUM**

4 mth old male, bronchiolitis

Patient videos, with consent, courtesy of Dr. Deb Long
Delirium: What does it FEEL like to Children

- 63% children report factual memory of PICU
- 32% report *Delusional Memories*
- Higher Post-traumatic stress scores with delusional memories (OR 5)

*Colville G, AJRCCM 2008*
Delirium – perspectives from Adult Patients
“This is not my child...”
“I didn’t talk about it for like, a year”
16 yo boy, Burkitt’s Lymphoma; p/c Sepsis and Typhlitis
• “I was trying to defend myself.... from aggressive kids – they were trying to punch me while I was on the floor. Also, they steal the water. They used to take it away from the bottle, because in the hospital, you can’t get a refill of water”
• “They used to give me this stuff... give me drugs, but I didn’t want it”
• “They were scared of me because I was like super crazy for a few days, um, cause of the high qualities of pain killers that I had in my body....that changed me”
• “They were trying to send me to the Mental unit, on the mountain.... Is that actually true?”
"All you can see is kind of like they’re expressing it – he was “not there”… he seemed confused… he was awake for hours and hours… he barely slept… he regressed a lot… he didn’t recognize anybody “No one on his team mentioned Delirium… I felt a lot of guilt”
“I was hanging out of the window and someone dropped a van on my head. They put me in glass box and sealed it”  
(17y, girl)

“A cat bleeding on the ceiling...”  
(14 yo girl)

“Loads of massive spiders – we had to throw stones at them. Men were running after me – I had to run into the sunlight”  
(9 yo boy)
Delirium in Critically ill Children

- **COMMON**
  - Important to patient and family centered outcomes

- **HARMFUL**: Significant short and long-term effects

- **PREVENTABLE**: Significant area of ongoing research

https://piculiber8.com/
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