Perioperative Management of Children With Autism: A Pilot Study

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Conflict of Interest
BACKGROUND
Autism

• Clinical diagnosis
• Males > females
• Equal distribution race, ethnicity, and SES
• Increasing prevalence:
  – 2-5/10,000 to 1/88 school aged children
• DSM V grouped autistic disorder, Asperger’s disorder, and PDD under “Autism Spectrum Disorder”
Autism

• Deficits with regards to social communication
• Restricted repetitive patterns
  – Repetitive motor movement
  – Insistence on sameness
  – Highly restricted fixated interests
• Present in early childhood
• May or may not have intellectual disability or GDD
Why is an intervention needed?

- Increasing numbers of children with ASD presenting to the OR (?2-4 a month)
- Require repeated general anesthetics for routine procedures (dental, eye, lab work) due to lack of co-operation
- Distressing and dangerous to health care personnel, caregivers, and other patients
- Causes delays and cancellations specifically in PACU
Previous Studies

• Van Der Walt et al 1998 pilot study at Women’s and Children’s Hospital South Australia on 5 children followed by an audit of 59 children (2001) over 4 years
• Thompson et al at Children’s Medical Centre Dallas (43 patients over 6 months)
• Dr. Joanne Schwartz at Children’s Hospital in Winnipeg in process of publication (250 patients over 3 years)
• Lindberg et al Skaraborg Hospital (Sweden) 12 patients qualitative study
Bottom Line

- Lack of cooperation: 50% in 1997, 42% in 1998, 30% in 1999 and 17% in 2000
- Early recognition
- Quiet Room
- Pre-op sedation – consider ketamine even in mild cases – do not need IV midazolam at the end of the case - have not had problems (hard to assess, give it in cola (parents take too!))
- Discuss in advance possibility of restraint with parents - less uncommon as time has gone on
- Parents are satisfied even when restraint has been used, anesthetists and nurses are enthusiastic
- Have expanded this program for other high needs children
“A tutorial on pilot studies: the what, why and how”
Thabane, L. et al 2010

PILOT STUDY
Pilot Study

• “You never test the depth of the water with both feet”
• Main goal is to test *feasibility* prior to starting a larger study
• Very good for unchartered territory
• Suitable to generate data for sample size calculations – especially when there is no previous data
Sample Size

• Does not need to be powered but should be representative of the target population
• Same inclusion/exclusion criteria as the main study
• Large enough to provide useful information
Defining Success

• Need specific criteria for success based on feasibility

• Outcome:
  – Stop: not feasible
  – Continue: with modifications
  – Continue: without modification but monitor closely
  – Continue: without modifications
MANAGEMENT OF CHILDREN WITH AUTISM IN THE OR: PILOT STUDY
PICO

• Population: All patients between the ages of 3-17 with a diagnosis of Autism Spectrum Disorder scheduled for elective surgery in the OR at MUMC who have had a previous general anesthetic in the Operating Room
• Intervention: a specific care bundle designed for children with autism in the OR
• Comparison: previous experience as rated by caregiver
• Outcome: Feasibility
POPULATION
Inclusion

- All patients between the ages of 3-17 with a diagnosis of Autism Spectrum Disorder scheduled for elective surgery in the OR at MUMC who have had a previous general anesthetic in the Operating Room
Exclusion Criteria

• Caregiver declines to give consent
Sample Size

• 10 patients who are seen in the pre-operative clinic between January 2014-June 2014
• Hypothesize 2-4 patients/ month
• Will ensure feasibility and allow for early changes
• Need enough patients to justify need for intervention but not too many that it is overly disruptive
INTERVENTION
ASD child is identified and consent is obtained from caregiver

- Child life interviews caregivers, fills template and gives handout
- Pediatric anesthetist fills out pre-printed order form for day of sx
- Child is booked as “Special accommodations” by desk clerk on OR list
Getting your child ready for surgery:

Please arrive 1 hour before surgery.

If possible, bring 2 caregivers for your child.

Bring any calming toys/items for your child.

Bring along any communication devices that may be helpful.

Bring along a favorite clear fluid (examples: Coke, Dr. Pepper, Powerade, apple juice.) * Please DO NOT GIVE TO CHILD PRIOR TO SURGERY *

If possible, have your child in a tank top and pajama pants for easy access for sedation in case needed.

These are suggestions that may help make your child’s surgery experience a little easier, please let staff know if there are additional things we can do to facilitate a positive experience.
Perioperative Plan for children with Autism Spectrum Disorder (based on Winnipeg template) to be designed on HHS stationary (*italics to be filled by peds anesthesia*)

Include:
- *Planned procedure*
- *Date*
- *Scheduled time*
- *Surgeon*
- *Age*
- *Height*
- *Weight*
- *BMI*
- *Other diagnosis*
- *Autistic Severity Level (based on Thompson et al)*

<table>
<thead>
<tr>
<th>Level</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level 1</td>
<td>Responds to name is aware of another persons presence</td>
</tr>
<tr>
<td>Level 2</td>
<td>Interacts with toys beginning language repetition in play and tasks</td>
</tr>
<tr>
<td>Level 3</td>
<td>Interacts with others controls own behaviour</td>
</tr>
<tr>
<td>Level 4</td>
<td>Maintains control verbalizes feelings understands rules and regulations</td>
</tr>
</tbody>
</table>
1. Communication style:
   a. Verbal
   b. Non verbal
   c. Verbal learner
   d. Visual learner
   e. Assistant devices:

2. Motivators likes:
   a. Food/ Drink (favorite clear fluid drink)
   b. Activities
   c. Objects
   d. Environment

3. Sensory Challenge Dislikes
   a. Smell
   b. Noise
   c. Touch
   d. Crowds
   e. Sight
   f. Other

4. Patients response to Likes
5. Warning Signs of Stress Triggers
6. Ability to Transition to New Environment

7. *Past Perioperative Experience*:
   - *Pleasant*
   - *Acceptable*
   - *Difficult*
   - *Extremely distressing*
Day of Surgery Order Set

Booking
☒ Patient to be booked on OR list as "special accommodations patient"
☒ Patient to be booked as first case of the day

Instructions for day of surgery
☒ Arrive 1 hour prior to surgery

Upon arrival to SDS
☒ Please page child life (pager x__) once patient arrives
☒ Patient may remain in own clothing

Pre-medication
☒ Apply Ametop (tetracaine 4%) to dorsum of both hands in SDS. Allow 30-45 minutes for desired effect.

Sedation (see mixing instructions below)
☐ Oral midazolam (0.5 mg/kg)_____mg to be given on arrival to SDS
☐ Oral ketamine (5-8 mg/kg)_____mg to be given on arrival to SDS
☐ Oral midazolam (0.5 mg/kg)_____mg + oral ketamine (0.25/3.0 mg/kg)_____mg to be given on arrival to SDS
☐ IM ketamine (2-5 mg/kg)

☒ Mix above sedation with 10 mL of
  ☐ Dr. Pepper™
  ☐ Coke
  ☐ Tylenol
  ☐ other____

Vital signs
☒ Please do one set of vitals 20 min after administration of sedation

***Complete all areas in signature box. Orders will not be processed without a written signature and bradma on each page***

Signature: ___________________________ Pager #: _______ Date: _______ (YYYY/MM/DD) Time: _______
Signature/Printed Name/Designation

Co-Signature: ___________________________ Pager #: _______ Date: _______ (YYYY/MM/DD) Time: _______
Signature/Printed Name/Designation

Transcribed By: ___________________________ Date: _______ Time: _______ (YYYY/MM/DD)
Signature/Printed Name/Designation

Checked By: ___________________________ Date: _______ Time: _______ (YYYY/MM/DD)
Signature/Printed Name/Designation

Copy Made For Pharmacy
Patient admitted to pre-op

Same day

Waiting room outside OR

OR

PACU

Same day
Admit to same day (caregiver registers)

Direct to OR

PACU

Home
# Health care Providers

<table>
<thead>
<tr>
<th>Sedation Scale</th>
<th>1. barely arousable asleep needs shaking or shouting to arouse</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2. asleep eyes closed arouses with soft voice or light touch</td>
</tr>
<tr>
<td></td>
<td>3. sleepy: eyes open but less active and responsive</td>
</tr>
<tr>
<td></td>
<td>4. awake</td>
</tr>
<tr>
<td></td>
<td>5. agitated</td>
</tr>
<tr>
<td>Emotional State Scale</td>
<td>1. calm</td>
</tr>
<tr>
<td></td>
<td>2. apprehensive not smiling tentative behavior withdrawn</td>
</tr>
<tr>
<td></td>
<td>3. crying</td>
</tr>
<tr>
<td></td>
<td>4. thrashing crying with movement of arm and legs resistance</td>
</tr>
</tbody>
</table>
Health Care Providers

Did you find these interventions disruptive to your usual routine?
Yes
No
Unsure

Did you find these interventions beneficial to your usual routine?
Yes
No
Unsure

Would you continue this intervention?
No
Yes
Yes with the following modifications:
____________
Comments:
Caregivers:

Rate your OR experience (previous and current)
- pleasant
- acceptable
- difficult.
- extremely distressing.

1. Did you fill out a pre-op template with child life and anesthesia?
2. Did the staff make reference to having reviewed the information?
3. What did you find helpful?
4. What would have been more helpful?
5. Did your child have difficulties? What helped and what do you wish the staff did at that time?
OUTCOMES
Feasibility Outcomes

• Able to enroll 10 patients over a 6 month period
• Able to collect data
• Adherence to protocol
• 90% follow up with parents
Definitive Trial Outcomes

• Primary: comparison of anesthetic + intervention to previous anesthetic

• Secondary:
  – Descriptive statistics of this population (type of surgery, comorbidities, age and weight)
  – Time from admission to surgery and time from PACU to discharge
  – Pre-operative sedation “success rates”:
    • Sedation scale 1-3
    • Emotional state 1-2
  – Qualitative data- caregiver perception of staff knowledge of autism, feelings and experiences peri-op
References

- Bagshaw, M. Aneasthesia and the autistic child. *Journal of Perioperative Practice*; 21 (90) 313-317
- Feld, L.H., Negus J.B., White P.F. Oral midazolam preanesthetic medication in pediatric outpatients *Anesthesiology* 1990 73, 831-834

[https://www.mencap.org.uk/sites/default/files/documents/2008-03/treat_me_right.pdf](https://www.mencap.org.uk/sites/default/files/documents/2008-03/treat_me_right.pdf)
QUESTIONS?
AN AUDIT OF PERIOPERATIVE MANAGEMENT OF AUTISTIC CHILDREN

J. H. Van Der Walt and C. Moran
• 87 anesthetics to 59 children over 4 years
• Patient identified on PaedRAP a database with recurrent anesthetic issues- alerts Anesthesia department
• Conducted a telephone interview by an anesthetist- filled out a questionnaire
• Direct admission to day surgery 45 minutes prior to surgery
• Oral midazolam 0.5 mg/kg for mild and ketamine 7 mg/kg 30 minutes prior to procedure
  – IM ketamine 5 mg/kg when oral premedication refused
• Mixed in a favorite clear fluid as per list (lemonade, cola, or apple juice)
• IV or inhalational induction
• IV fluids and tropisetron used prophylactically
• Given oral (prior to surgery) or rectal tylenol
• Adequate analgesia
• Child is recorded as “cooperative or uncooperative” by anesthetist
• PONV episodes recorded
• Nursing notes examined
• Anesthetistic record filed in Autistic registry
Results

Analysis of procedures for which 87 anaesthetics were administered

<table>
<thead>
<tr>
<th>Procedure</th>
<th>n</th>
<th>Numbers admitted for overnight management</th>
<th>Emergency procedures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dental</td>
<td>31</td>
<td>–</td>
<td>1</td>
</tr>
<tr>
<td>Ear nose and throat surgery</td>
<td>19</td>
<td>9</td>
<td>1</td>
</tr>
<tr>
<td>General surgery</td>
<td>8</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Orthopaedic surgery</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Ophthalmology</td>
<td>3</td>
<td>1</td>
<td>–</td>
</tr>
<tr>
<td>Gastrointestinal endoscopies</td>
<td>4</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Cardiac catheter</td>
<td>2</td>
<td>2</td>
<td>–</td>
</tr>
<tr>
<td>Magnetic resonance imaging</td>
<td>6</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Computerized axial tomography</td>
<td>9</td>
<td>2</td>
<td>–</td>
</tr>
<tr>
<td>Brainstem evoked response</td>
<td>2</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Total</td>
<td>87</td>
<td>16</td>
<td>4</td>
</tr>
</tbody>
</table>
The group who received no sedative (Nil or Refused) had a significantly ($P < 0.05$) shorter stay in the recovery area compared with the midazolam and ketamine groups. There was no statistical difference in the discharge time for 71 day cases from hospital between all the groups. The ketamine/midazolam was not subjected to statistical analysis due the small number of patients.
Pilot study

• Grouped under:
  – Process: process key to the success of the main study
  – Resources: assessing time and resource issues that can arise in the main study
  – Management: personnel and data management
  – Scientific: treatment safety, dose levels and response