Evaluation of pain management for adult sickle cell patients in a emergency department

T. Préseau M.D.
For the CHUB/EDU team

Alone we can do so little, together we can do so much
Helen Keller

Haematology department: M.A. Azerad MD, C. Chan (Head Nurse), B. Dohet (Reference nurse for sickle cell), S. Depauw (Psychologist), A. Efira M.D.

Emergency department: T. Preseau MD, T.M.Q. Tran MD, S. Belhaj (Head Nurse), S. El Hamzaoui (Reference nurse for pain treatment).

Clinical research Unit: T. besse-Hammer MD, B. Dumoulin (statistics)
Speaker: Thierry Préseau M.D.  

Title: Evaluation of pain management for adult sickle cell patients in a emergency department

- Member of a scientific committee
- Speaking or writing in exchange for remuneration
- Travel expenses and/or registration to congresses or other events covered
- Leader of research of clinical study

Sickle cell patient in ED

- EDs:
  - Vaso-occlusive crisis is the most common emergency by these patients
  - Wait quite long (overcrowding: 65 000 pat/year):
    - First contact most important for trust.
    - Long waiting time first cause of complaints.
  - Under evaluation of the pain:
    - Chronic pain => not so demonstrative.
    - Evaluation of the pain often different between patient and nurses/doctors.
    - Low knowledge of the disease by the ED teams.
    - Inadequate treatment
Sickle cell patient in ED

- Brugmann: one of the biggest population of adult sickle cell patients in Belgium.
  - Public hospital
  - Close relationship with the « Queen Fabiola Children University Hospital »
  - Reference center
  - Lot of ED admission (min 2/week).

Goals

**Quality**

- Improve knowledge
- Introduction of a written protocol
- Evaluation of the protocol (quality evaluation by the patients, follow up of the treatment: of medication doses, population,...)
- How to improve?
• **Endpoints:**

  • Treatment evaluation
    – Analogic Visual Pain Scale (t0), 1h, 3h, 6h then every 6h until pain is gone.
    – Respect of the written protocol.
      • Systematic paracetamol + NSAID: done
      • Systematic hyperhydration: done
      • IV Morphine: 0.05 to 0.08 mg/kg/15 minutes for pain evaluation > 6/10.
    – Waiting time (organisation).
  • Patient satisfaction survey

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**Materiel en method**

• Recruitment?
  • Ethical committee
  • Adult patients > 18 y (informed consent)
  • In haematology consultation and in ED.

• Which team, which tools?
  • ED nurses, ED doctors
  • Visual Analogic Pain Scale,
  • written protocol for treatment (paracetamol, NSAID, Morphine 0.05 mg/kg/15 min)

• How do we evaluate?
  • Patient survey form: satisfaction from 1 (very bad) to 5 (very good).
Recruitment?

- Acceptation by the Ethic Commitee.

- **Inclusion criteria’s:**
  - All adult patient (> 18 years) who are known with Sickle Cell Disease (all forms), with acute pain crisis.
  - Able to understand and accept his participation to the study
    - No impaired mental status

- **Exclusion criteria’s:**
  - All other possible cause of pain
    - Trauma,....
  - Unable to sign the written informed consent.

- **Recruitment:**
  - A priori: on hematology consultation:
    - Receive a « Study Member Card » to show at the ED gate.
  - On ED: when patient is coming with a acute crisis.

Wich team, wich tools?

- Informed consent by haematologist or ED

- Nursing and medical team from the haematology and ED department.
  - Previous staff to explain the study and the protocol.

- Survey was given to the patient in ED or in the haematology department
  - Conception of the form by Mrs De Pauw (psychologist) et Mrs Dohet (reference nurse for sickle cell patients).
  - All item evaluated from 1 (very bad) to 5 (very good).

- Analyse of the data’s by the Clinical Reseach Department
  - Fully independance with the other departments.
"VIP Card"

CHU BRÜCKMANN
ULB

CLINIQUE D’HÉMATOLOGIE

URGENT CRISE DREPAANOCTAIRE PROBABLE

Dr. EFINA
Dr. AZEEMAD
Infirmière de références : 92/4277.98.77
How to evaluate the pain?

- Visual Analogic Pain Scale (VAPS)
  - at admission (t0),
  - 1h, 2h, 3h, 6h and after that every 6 hours
  - till the pain is gone.
- VAPS by patient, Numeric pain scale evaluation by the nurses
- Permanent evaluation until the patient is discharged from hospitalisation.
Results

- Starts on February 1st, 2013, stops January 31st, 2015: 2 years.
- 104 observations by 51 patients (6 unusable evaluations)

<table>
<thead>
<tr>
<th>Admissions in ED</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>11</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients</td>
<td>31</td>
<td>9</td>
<td>2</td>
<td>4</td>
<td>3</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

Men/Women: 60/44 (58%/42%)
Mean age M/W: 26.5/25.9

Population

<table>
<thead>
<tr>
<th>Age (years)</th>
<th>Weight (kg)</th>
<th>BMI</th>
<th>Stay (days)</th>
<th>Mn Dose (mg)</th>
<th>Wall (mm)</th>
<th>1st dose (mg)</th>
<th>Glob sat</th>
<th>Hgb sat</th>
<th>1PCT</th>
<th>PLT (10^3/l)</th>
<th>LDH (u/l)</th>
<th>CRP mg/l</th>
<th>D-dim (mg/l)</th>
<th>HBCO</th>
<th>Ery Bl %</th>
<th>APTT (sec)</th>
<th>INR ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>26.18</td>
<td>60.39</td>
<td>10.75</td>
<td>31.93</td>
<td>16.00</td>
<td>3.77</td>
<td>9.04</td>
<td>11.31</td>
<td>235.43</td>
<td>42.88</td>
<td>15.84</td>
<td>1.7850</td>
<td>0.06</td>
<td>5.48</td>
<td>40.63</td>
<td>1.10</td>
<td>0.29</td>
</tr>
<tr>
<td>St dev</td>
<td>7.18</td>
<td>17.23</td>
<td>3.35</td>
<td>11.40</td>
<td>30.74</td>
<td>1.06</td>
<td>2.00</td>
<td>6.07</td>
<td>132.74</td>
<td>41.04</td>
<td>21.31</td>
<td>1.65</td>
<td>0.22</td>
<td>6.90</td>
<td>3.08</td>
<td>0.34</td>
<td>0.19</td>
</tr>
<tr>
<td>Median</td>
<td>26.15</td>
<td>66.62</td>
<td>22.44</td>
<td>12.49</td>
<td>3.84</td>
<td>10.91</td>
<td>186.00</td>
<td>4.58</td>
<td>140.61</td>
<td>49.07</td>
<td>8.82</td>
<td>1424.47</td>
<td>1.91</td>
<td>6.50</td>
<td>31.97</td>
<td>1.03</td>
<td>0.30</td>
</tr>
<tr>
<td>St dev</td>
<td>7.15</td>
<td>10.07</td>
<td>2.04</td>
<td>12.21</td>
<td>22.88</td>
<td>0.81</td>
<td>2.78</td>
<td>4.05</td>
<td>160.03</td>
<td>178.78</td>
<td>11.50</td>
<td>575.38</td>
<td>1.23</td>
<td>5.47</td>
<td>1.33</td>
<td>0.07</td>
<td>0.07</td>
</tr>
</tbody>
</table>

- Severe disease: need for transfusion/plasmapheresis or hospital stay > 8d.
- Mild disease: No transfusion, hospital stay < 8d.
- Tot. population: all patients.

Remarks

No statistical difference for biological parameters.
Mean patient estimated waiting time for first contact: 18.6 min.

<table>
<thead>
<tr>
<th>Mean waiting time</th>
<th>Nbre</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-5 min</td>
<td>28</td>
<td>37.3</td>
</tr>
<tr>
<td>6-10 min</td>
<td>20</td>
<td>26.7</td>
</tr>
<tr>
<td>11-20 min</td>
<td>13</td>
<td>17.3</td>
</tr>
<tr>
<td>21-30 min</td>
<td>7</td>
<td>9.3</td>
</tr>
<tr>
<td>30-60 min</td>
<td>2</td>
<td>2.6</td>
</tr>
<tr>
<td>&gt; 60 min</td>
<td>5</td>
<td>6.6</td>
</tr>
</tbody>
</table>

Figure I
Comparatif EVA patient - EVA infirmier
## Morphine dose

<table>
<thead>
<tr>
<th></th>
<th>Women</th>
<th>Men</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>M+ in mg (mean)</td>
<td>14,5</td>
<td>11,6</td>
<td>&lt;0,001</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(Student t-test)</td>
</tr>
<tr>
<td>M+ in mg (SD)</td>
<td>13,17</td>
<td>11,48</td>
<td>-</td>
</tr>
<tr>
<td>Satisfaction (mean)</td>
<td>3,7</td>
<td>3,9</td>
<td>-</td>
</tr>
<tr>
<td>Satisfaction (SD)</td>
<td>0,98</td>
<td>0,97</td>
<td>-</td>
</tr>
</tbody>
</table>

## Mean morphine dose and satisfaction, / 3 months

<table>
<thead>
<tr>
<th></th>
<th>M+ (mg)</th>
<th>Waiting time (min)</th>
<th>Satisfaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st Quadri (feb 2013)</td>
<td>10,7</td>
<td>19</td>
<td>4,1</td>
</tr>
<tr>
<td>2ème Quadri (juin 2013)</td>
<td>15,3</td>
<td>26</td>
<td>4</td>
</tr>
<tr>
<td>3ème Quadri (oct. 2013)</td>
<td>12,3</td>
<td>10,8</td>
<td>3,6</td>
</tr>
<tr>
<td>1er Quadri (feb 2014)</td>
<td>13,4</td>
<td>13,4</td>
<td>3,7</td>
</tr>
<tr>
<td>2ème Quadri (juin 2014)</td>
<td>11,3</td>
<td>11,8</td>
<td>4,1</td>
</tr>
<tr>
<td>3ème Quadri (oct 2014)</td>
<td>14,7</td>
<td>42,7</td>
<td>3,2</td>
</tr>
<tr>
<td>(0-24 mois)</td>
<td>12,8</td>
<td>18,6</td>
<td>3,8</td>
</tr>
</tbody>
</table>
Correlations between Satisfaction, waiting time and given morphine dose.

<table>
<thead>
<tr>
<th>Satisfaction</th>
<th>Waiting time</th>
<th>M+ dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Satisfaction</td>
<td>1</td>
<td>-0.32</td>
</tr>
<tr>
<td>Waiting time</td>
<td>-0.32</td>
<td>1</td>
</tr>
<tr>
<td>M+ dose</td>
<td>-0.24</td>
<td>0.0</td>
</tr>
</tbody>
</table>

Mean satisfaction level: 3.8

Correlation BMI – Morphine dose: 0.17
Correlation weight - Morphine dose: 0.13
Correlation Global satisfaction- waiting time: -0.32
Discussion: Waiting time

• Mean waiting time 18.6 minutes (First contact).

• >65% of patient waits< 10min
  • < sensibilisation of the team.

• Shortened in the timeline (except when staff is changing)
  • Higher in October each year (new nurses and doctors).

• Much longer for first IV Morphine dose (55 min)
  • Difficult to place a catheter.
  • Trying of other drugs: tramadol, … even if VAPS > 6.

Discussion: Pain evaluation

• Why a difference between care givers and patients?

  • >60% of care givers think that patients are addict to morphine, 30% of them have a problem with systematic administration of morphine.¹

  • Real addiction : 0.2% et 2%²

  • Lack of comprehension and fear of addiction leads caregivers to minimise morphine use and dosis³⁴.

Discussion: Morphine dose

- Protocol: 0,05 à 0,08 mg/kg every 15 minutes if pain > 6/10.
- English guidelines: 0,10 à 0,15 mg/kg every 15 to 30 minutes\(^1\)\(^3\)
- In our study: lower doses than in the protocol.
- Women receive more Morphine than men
  - Less suspicion of addiction?
  - More demonstrative?
  - Other?


Limitations of our study

- Visual Analogic pain scale is subjective
- Simplified satisfaction scale (no validation)
- Selection bias?
  - Pre-enlisted patients
  - Known with disease.
  - No witness group.
Conclusions:

• Mean satisfaction quite good: 3,8/5
  • > sensibilisation over the specific needs of a sickle cell patient.
  • Recognition of the problem: « VIP » cards.
  • Pre-training
  • Despite unappropriated morphine dose.
    − 0,05 mg/kg / 15 min.

Conclusions:

• But:
  − Need for feedback and permanent sensibilisation/ formations
    − New team, ...
  − Deconstruct the ideas over morphine addiction
    − Staffs
  − Insist over the protocol’s morphine doses following patient weight:
    − 0,05 mg/kg / 15 min.
  − Minimise time to drug time
Newborn ideas?

• Shortening the inscription to drug interval?
  – Long time to IV:
    • Low venous capital patients
    • ED overcrowding.
  – Systematic Porth-a Cath:
    • Often refused < aesthetic barrier.
  – Other ways:
    • Oral morphine (Oxycodone)
    • Intranasal administration of Sufentanyl/ Morphine.

Take home messages

• Our study have lead to a de-demonization of the SCD patient in our ED, and have made of those patients VIP patients 😊

• Pain management is complex, but must only be based over the patient’s pain evaluation.
  • Take care of the false ideas about morphine use and addiction.

• Multi-disciplinary collaboration is needed to obtain results
  • With written protocols available on intranet.
  • With permanent evaluation.

• Continuous training and sensibilisation is requested.

• Other ways than IV must be evaluated and used.
Thank you

Questions?