Chronic pain in the severely injured intensive care patient:

Lessons learnt from OUS trauma registry and the 22.July victims

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With a lot of help from:

- Knut Magne Kolstadbraaten
- Kristin Wisløff Aase
- Marianne Løvstad
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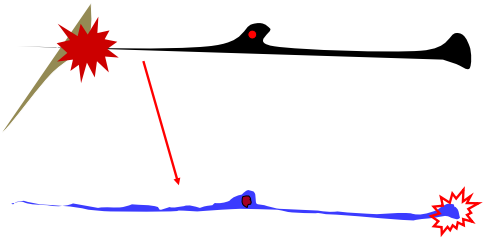
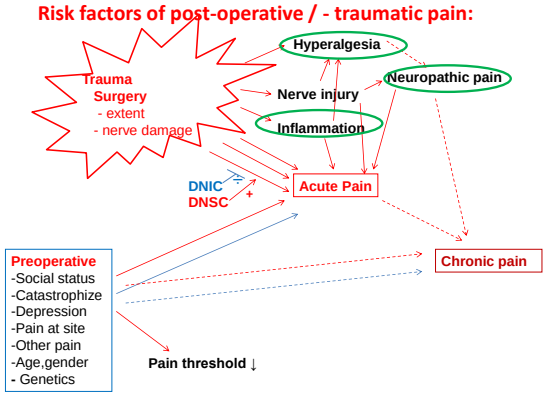
And others

OUS and Sunnaas Rehabilitation Hospital



→ *NEUROPATIC PAIN !!*

Risk factors of post-operative / - traumatic pain:



Chronic pain after major trauma: *Incidence and initial treatment*

(Kolstadbraaten KM, Spreng U,Wisløff-Aase K, Raeder J)

- All acute multi-traumatized patients during 2007, OUS-Ullevål
  - injury severity score (ISS) of more than 8
  - age 18-80 year

  were considered for inclusion in the study.
- Excluded:
  - patients intubated before or at admission,
  - patients with isolated and severe head-trauma
  - initial surgery less than 3 hours
  - discharge before 6 hr,
  - known drug abuse and psychiatric disorders were not included.
- Primary data:
  - demography, type of injury, initial analgesic therapy
- At 5-6 years after the trauma
  - written questionnaire, focus on initial pain and chronic pain

Chronic pain after major trauma: *Incidence and initial treatment*

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- 125 patient were considered for questionnaire after 5 years, of these 29 were excluded
  - 96 patients were finally included and received the questionnaire,
  - 68 (71%) answered.
- In this final data set:
  - 77% men
  - mean age 40 years
  - mean ISS = 18.
- The patients stayed a mean of 30 min in the acute reception area where 82% received fentanyl, 8% ketamine and 35% diazepam.
- No patients received any paracetamol, NSAIDs, nerve blocks or epidural analgesia during initial treatment in hospital.
- In 14 patients epidural analgesia was later instituted, in 13 within 48 hr.

Chronic pain after major trauma: *Incidence and initial treatment*

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- 68 respondents:
  - 46 (70%) had some sort of chronic pain at the site of injury at 5 years or more after the trauma
    - 21 % had daily pain
    - 16 % more than once per week
    - 18 % more than once per month
    - 15 % once or less per month
  - . The worst pain was described as:
    - 3.0 % very strong
    - 16 % strong
    - 39 % medium
    - 12 % weak

Chronic pain after major trauma: *Incidence – initial treatment*

(Kolstadbraaten KM, Spreng U,Wisløff-Aase K, Raeder J)

Thoracic trauma:

- 12 patients received epidural analgesia
- 23 did not receive epidural (non-medical reasons)

→Similar incidence of chronic pain:
83%(epi) versus 69% (non-epi) (ns)

Chronic pain after major trauma: *Incidence – initial treatment*

(Kolstadbraaten KM, Spreng U,Wisløff-Aase K, Raeder J)

→ More than 2 out of 3 severely multi-traumatized patients will develop chronic pain, evident at more than 5 years after the injury.

→ In 58 % the pain is medium or stronger, and in 49 % more frequent than once per week.

→ In 2007 our hospital had little focus on dedicated prophylaxis for chronic pain

AND.....

→ There may be a potential to reduce the incidence of chronic trauma with more aggressive and multimodal initial pain protocols.

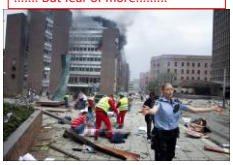
22. Juli 2011

- 8 people where killed in the governmental quarters, and 209 injured, whereof **10 required hospitalization**

Then.....

- There were 564 people on the Utøya island, whereof 69 were killed, and **37 transported to hospital**

Sudden, shortlasting → injury
..... But fear of more.....



Extreme, > 1 hr fear of death
+/- severe injury

Sample

- 47 persons were transported to a hospital
  - 21 directly Oslo University Hospital (OUH)
  - 23 to Vestre Viken Local Hospital (Ringerike)
    - 9 patients were redirected from VV to OUH
  - 4 to other local hospitals

- A total of **43 persons were identified as potential participants**, whereof 33 were injured at the Utøya island, and 10 in the governmental quarters in Oslo.

30 persons eventually agreed to participate (68% response rate)

- 7 from governmental quarters
- 19 women, 11 men
- Mean age 27 yrs (range 19-71, only 5 over 30)
- Patients assessed May 2014 – March 2015

Data and data collection

- **A:** Detailed acute medical data, anamnestic information and medical status by 22/7-2011
- **B:** Cognitive, psychosocial and pain data 3-3.5 years later
  - Comprehensive data set obtained by 2 day visit at Sunnaas Rehabilitation Hospital
  - All patients assessed by experienced anesthesiologist, rehabilitation physician and psychologist

Outcome measures

PostTraumaticStressDisorder: UCLA PTSD Reaction Index (Steinberg et al., 2004)

Emotional distress: Hopkins Symptom Checklist 8 (HSCL-8), pluss item on suicidal ideation (Winikur et al., 1984).

Fatigue: Fatigue Severity Scale (Krupp et al., 1989).

Sleep: Insomnia Severity Index (Bastien et al., 2001).

Resilience: Resilience Scale for Adults (Friborg et al., 2003).

Optimism: Life-Orientation Test-Revised (LOT-R) (Scheier, M. F., Carver, C. S., & Bridges, M. W., 1994).

Extroversion and Neuroticism: Norwegian version of the 15-item Big Five Inventory (Engvik & Føllesdal, 2005)

Social support: DUKE-UNC Functional Social Support Questionnaire (FSSQ) (Broadhead et al., 1988).

Submitted:

Individuals hospitalized with physical injuries caused by the terror attacks in Norway July 22nd 2011 - relationship between outcomes and medical and psychological factors.

Løvstad, M.[1, 2], Månum, G.[1, 3], Wisløff-Aase, K. [3, 4], Hafstad, G.[5], Ræder, J. [3, 5], Larsen, I.[1], Stanghelle, J. [1, 3], Schanke, A.-K. [1,2]

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[3] Institute of Clinical Medicine, Faculty of Medicine, University of Oslo
[4] Department of Anaesthesiology, Oslo University Hospital
[5] Norwegian Centre for Violence and Traumatic Stress Studies, NKVTS

Outcome measures - pain

Any pain related to the terror attack?
.....if positive→ pain protocol:

- Site of trauma was reported by drawing / ticking/ putting marks on an illustrated body; representing the anatomical areas.
- The painful areas were marked on another identical illustration.
- The participants rated the maximum, minimum and mean levels of pain the previous week and during the consultation on an 11-point numerical rating scale (NRS) from 0 – 10 with 0 = "no pain" and 10 = "The most intense pain imaginable".
- The participants reported whether or not the pain had consequences for daily life and quality of life. The validated questionnaires were used:
  - PCS – Pain Catastrophizing scale (Sullivan, Bishops & Pivik, 1995),
  - General self-efficacy scale
  - ISI – Insomnia Severity Index (Bastien et.al. 2001)
- DN4 –(i.e. Douleur Neuropathique 4, ref: Bouhassira et al 2005) were used to categorize a neuropathic component.
  - Sensory abnormalities were identified by comparing the body-area where the participant addressed pain at the drawings, with assessment at a reference contralateral mirror area.
  - The reference area and the indexed area were first examined by warm (40.0°C) and cold (20.0°C) metal rolls (SBMEDIC Electronics, Sweden), brush (SENSELab Brush 05, Somedic, Sweeden), cotton wad, and pinprick stimulation (256 mN vonFrey filament, VF7 Optihair, Marstock Nervtest, Germany).

  → Pain to be classified as "probable" neuropathic pain

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Results 1 – Injuries

Table 2. Injury characteristics

	Mean (SD)	Median (Q_1, Q_3)	Range
Mechanism of trauma (n)			
- explosion	6		
- gun fire	20		
- other	4		
New Injury Severity Scale (NISS)	23.27 (19.14)	24.5 (3.75-37.25)	0-59
- NISS >15 (n)	18		
Body areas (number injured)			
- head/neck	8		
- face	11		
- chest	13		
- abdomen/pelvis	10		
- extremities	20		
- external	14		
Days on respirator	4.03 (9)	0 (0-2.25)	0-41
Number of surgical procedures	4.7 (5.19)	3 (1-4.75)	0 - 22 0 = 3 1-5 = 17 >5 = 9
Minutes in surgery	746.11 (103.585)	449.5 (213.5-874.75)	0-4589
Days in intensive care	9.4 (12.97)	2.5 (0-15.25)	0-59 0 = 8 >5 = 14
Acute hospitalization time (days)	16.1 (17.51)	14.5 (1-27.25)	1-81
Transferred to (%)			
- home	10 (33.3)		
- somatic hospital	11 (36.7)		
- specialized rehabilitation	8 (26.7)		
- psychiatric hospital	1 (3.3)		

- 18/30 victims were severely injured (New Injury Severity Scale (NISS)>15).
- Wide variety in injury severity as indexed by NISS, days on respirator, surgical procedures, days in intensive care (ICU), and hospitalization time.
- E.g., 8 patients did not receive ICU treatment, while 14 spent more than 5 days in ICU.
- Four patients had no surgery, while 1/3 had more than 5 surgical procedures, with a maximum of 22.
- Acute hospitalization time varied from 1-81 days, with a mean of 16.
- One third were released to their homes, while 2/3 where transferred to local somatic hospitals (n=11), to specialized rehabilitation institutions (n=8), or to a psychiatric hospital (n=1).

Outcome – pain (n=30):

- Twenty-four patients (80%) reported injury related pain last week
  - median score of average pain of 3 on a 0-10 severity scale
- In 16 patients (67% of those with pain) the pain started at time of injury, whereas in four patients (17%) the pain started more than four weeks after the injury
- In 18 patients (75% of those with pain) the worst pain related to injury was above three, whereas 12 patients (50%) stated that pain was above three on average last week
- Only six persons indicated no injury-related pain, whereof one reported present pain that was not related to the injury.
- In 12 patients (50% of those with pain) clinical signs of neuropathic pain were evident as defined by a DN4 score of more than four.

Outcome – pain:

- Pain resulted in:
  - reduced sleep quality in ten patients (33% of total)
  - reduced daily activities or work abilities in 12 patients (40%)
  - reduced quality of life in 15 patients (50%) .

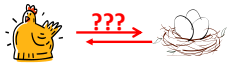
→ In a total 22 patients the pain was notified to have one or more consequences on daily life and functions

(ie: daily activities, social activities, work, sleep, psychological health, quality of life, abuse)

- 66% of the patients (n=20) were using pain killers, - including 17% (n=5) in need of opioids

Conclusions:

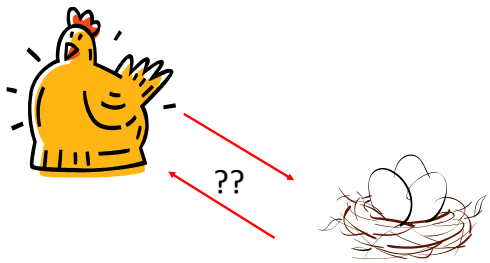
- The patients received dedicated pain treatment initially:
  → pain visits, neural blocks, neuropatic pain drugs
- 60% had clinically significant pain after more than 3 years
- Pain was not related to injury or pre-injury characteristics
  - (as we have recorded)
- Those with pain have significant more problems:
  - Sleep, Quality of life, Concentration, Memory, Depression



Kronisk smerte v/ mye el. langvarig postoperativ smerte:

1) Fordi traumet eg.var større: → mer tidlig smerte → senere smerte?

2) Fordi ubehandlet smerte i seg selv gir mer kronisk smerte?



Results 2 – Psychological outcomes

Table 3. Symptoms of post traumatic stress, emotional distress, fatigue and sleep disturbances

	Mean (SD)	Median (Q_2, Q_3)	Range
PTSD reactions			
PTSD-RI total score	19.6 (13.9)	15 [7.8-29]	1-51
PTSD-RI ≥38 (n)	4		
Full PTSD (n)	4		
Partial PTSD (n)	5		
Emotional distress			
HSCL-8 total mean	1.9 (.9)	1.56 [1.2-2.7]	1-3.9
HSCL-8 total mean ≥1.85 (n)	12		
HSCL-8 anxiety mean	1.9 (1)	1.63 [1-2.6]	1-4
HSCL-8 anxiety mean ≥1.85 (n)	14		
HSCL-8 depression mean	1.91 (.9)	1.5 [1-2.8]	1-4
HSCL-8 depression mean ≥1.85 (n)	11		
Suicidal ideation			
1 (not at all) (n)	27		
2 (somewhat) (n)	3		
Fatigue			
Fatigue Severity Scale (FSS) mean score	3.9 (1.7)	4.1 [1.9-5.2]	1-6.6
- No fatigue (FSS<4) (n)	15		
- Moderate fatigue (FSS 4-4.9) (n)	5		
- Severe fatigue (FSS ≥ 5) (n)	10		
Sleep			
ISI	8.9 (7.4)	7 [2.5-15]	0-26
- No sleep disturbance (ISI<8) (n)	16		
- Subthreshold insomnia (ISI 8-14) (n)	6		
- Moderate insomnia (ISI 15-21) (n)	7		
- Severe insomnia (ISI 22-28) (n)	1		

- Four (13%) reported **PTSD** symptoms above the recommended cut-off value (≥38). Median score 15. The same four met criteria for symptom clusters B, C and D, i.e. full PTSD. Another 5 participants met criteria for partial PTSD.
- Twelve scored at or above a mean **HSCL-8** total score of 1.85.
- Half displayed symptoms of **fatigue, with** five rating themselves with moderate fatigue (FSS 4-4.9), while 10 reported severe fatigue (≥5).
- 14 reported subthreshold (6), moderate (7) or severe (1) **sleep problems**. Fourteen were worried about their sleep problems, varying from a little bit (n=3), somewhat (n=4), a lot (n=5) to very much (n=3).
- Only six persons indicated no **injury-related pains**, whereof 1 indicated pain that was unrelated to the injury. Of the remaining 24, 12 indicated that pain affected their daily activities and work abilities, and 15 also indicated that pain affected their quality of life.

Results 3 – Association to injury severity?

- No differences in outcome among those with **mild versus severe injuries**, as the groups with NISS ± 15 did not differ significantly with regard to PTSD symptoms, emotional distress, fatigue, sleep disturbances, or mean pain over the previous week (all p-values >.34).
- When correlating the same outcome variables as continuous data with continuous NISS scores as well as other indicators of injury severity such as number of **acute hospitalization days, number of days in the intensive care unit, number of surgical procedures and total minutes in surgery**, no significant associations where found (all p-values >.34).