Postersession I

Abstract A

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Medforfattere	Ann Møller, Kim Wildgaard
Titel	Preoperative femoral nerve block for hip fracture - A systematic review

Background

The incidence of hip fractures is rising, and the patients with hip fractures have more complex diseases with multiple drug prescriptions. Safe and good pain treatment is needed, as conventional pain treatment is challenged by comorbidities of the patients. Our aim was to investigate evidence for the efficacy of femoral nerve block (FNB) for pre-operative pain treatment in hip fracture patients.

Methods

We performed an exhaustive search in three databases (Medline, EMBASE, CENTRAL) from their inception until 4th of January 2018, as well as the WHO trial registrar and clinicaltrial.gov. Selection criteria were: RCT study, single shot FNB for pain treatment pre-operatively after acute hip fracture, pain score assed pre-operatively after minimum 30 minutes and compared to any pain treatment regime.
Data was collected for: Technic of needle placement, local analgesic type, local analgesic dose, standard pain treatment given, conventional pain treatment, rescue medicine, significant reduction in pain, cognitive impairment.
No restriction for language or publication years were imposed.

Results

Five randomized, controlled studies including 513 participants were eligible for inclusion. No study used placebo as comparison.
All five studies showed significant decrease in pain score at least once for the intervention group compared to the control group (table 1). Three studies found decreased use of rescue medication.
No adverse effects related to the nerve block was reported in the five studies.
All five studies were high in risk of bias.

Discussion

Other reviews agree with our primary outcome as well, but they tend to group all types of femoral nerve block together. Cognitive impairment has stirred less reviews, as studies tend to exclude patients with cognitive impairment.
A subgroup analysis between ultra sound assisted FNB and nerve stimulation assisted FNB was planned but could not be conducted, as no study used ultra sound.
Limitations of the review reflect the general limitations of study design, and the design of the included studies sadly results in high risk of bias.
The strengths for this review lies in the wide search, no restrictions regarding language or year of publication and the strict adherence to guidelines from PRISMA.

Conclusions

Femoral nerve block seems to be an effective method for treating the pain after an acute hip fracture, but more research is needed to find the optimal dose, drug and method. Our primary endpoint showed a decrease in pain for the intervention group with femoral nerve block compared to other types of pain treatment, although the significant decrease was found at different timepoints. Our secondary endpoint, cognitive impairment, was only addressed in one study and hinders conclusion.

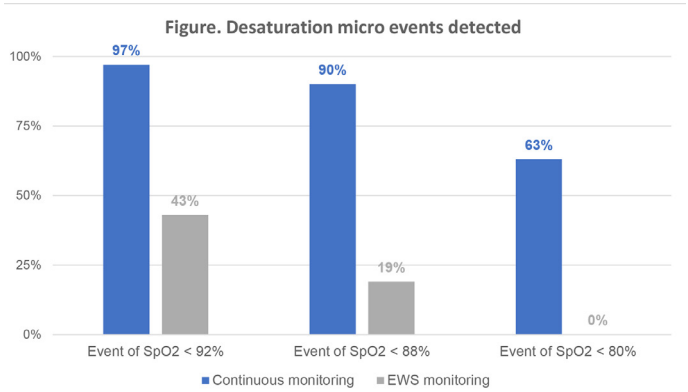

Table: Cardiopulmonary micro events during admission for Acute Exacerbation of COPD

	Continuous monitoring, n=30	EWS monitoring, n=30	p-value
Desaturation micro events			
SpO_2 <92%			
Number of patients (SpO_2 <92%)	29 (97%)	13 (43%)	<0.0001
Duration, minutes (SpO_2 <92%)	996 [99-3119]	0 [0-2066]	<0.0001
Number of patients with event (SpO_2 <92%) lasting more than 60 minutes	24 (80%)	13 (43%)	0.01
SpO_2 <88%			
Number of patients (SpO_2 <88%)	27 (90%)	4 (13%)	<0.0001
Duration, minutes (SpO_2 <88%)	156 [0-1237]	0 [0-165]	<0.0001
Number of patients with event (SpO_2 <88%) lasting more than 60 minutes	11 (37%)	2 (7%)	0.01
SpO_2 <80%			
Number of patients (SpO_2 <80%)	19 (63%)	0	<0.0001
Duration, minutes (SpO_2 <80%)	3 [0-79]	0	<0.0001
Number of patients with event (SpO_2 <80%) lasting more than 10 minutes	5 (17%)	0	0.05
Other cardiopulmonary micro events			
Heart rate >130/min	15 (50%)	4 (13%)	0.005
Heart rate <41/min	0	0	
Respiratory rate >24/min	18 (60%)	7 (23%)	0.008
Respiratory rate <9/min	18 (60%)	0	<0.0001
Systolic Blood Pressure < 90 mmHg	7 (23%)	2 (7%)	0.15

Values are number (percentage) or median [5%-95% range]. Duration of each event is calculated as median of the cumulative duration among all included patients.

Abstract H

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Titel Introduction The North Denmark Region implemented an electronic Prehospital Patient medical Record (PPR) in 2006. In 2015 a new version of the PPR was implemented. Implementation of new technologies can be challenging, including structurally and organizat

Introduction
The North Denmark Region implemented an electronic Prehospital Patient medical Record (PPR) in 2006. In 2015 a new version of the PPR was implemented. Implementation of new technologies can be challenging, including structurally and organizational obstacles, which causes difficulty in achieving data completeness. The aim was to examine completeness of registrations of vital parameters in PPR before and after the new version, and examine the distribution of the registrations.

Method
The cohort includes all patients to whom an ambulance was dispatched after an emergency 112-call in the North Denmark Region from 2007-2014 and 2016. We examined the registration and distribution of six vital parameters,

and included the first measurement. A trend analysis was used to assess the change in registration from 2007 to 2014 and 2016. To exclude outliers in registrations we defined cut-points for systolic blood pressure (BP) (300mmHG), heart rate (HR) (300 beats per minute), and Respiratory Rate (RR) (100 breaths per minute), based on clinical relevance and their natural distributions. The other vital parameters had well-defined cut-points. We examined the distributions with and without outliers.

Results
We identified 220,173 patients. Percentage of registrations without outliers from 2007 to 2014 vs. 2016: BP 73% to 86% vs. 81%, HR 76% to 88% vs. 81%, blood oxygenation (SpO2) 72% to 85% vs. 81%, RR 34% to 82% vs. 77%, Glasgow-Coma-Scale-score (GCS) 54% to 92% vs. 81%, Numeric Rating Scale for pain (NRS) 0% to 16% vs. 24%.
Data from all years showed normal distributions for systolic BP and HR with mean (95% confidence interval): 141.8 (141.7; 142), 91.9 (91.8; 92.1), respectively. For RR, SpO2 and NRS; median (interquartile range) was: 18 (16; 20), 98 (95; 99), 6 (3; 8). From 2007-2014, 82% of the GCS-scores were on 15; in 2016 85% were on 15. There was 51% of the patients who had five vital parameters measured from 2007-2014, 47% in 2016.

Conclusion
Registration increased significantly from 2007 to 2014, with a significant decrease in 2016, except for the NRS-score. The decrease in 2016 is probably attributed the implementation process. Overall vital parameters were within normal ranges, despite outliers in registration.

Abstract G

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Titel	Prehospital breathing difficulty: symptoms at emergency call and hospital diagnoses

Introduction
Despite that acute dyspnoea is a potential life-threatening symptom, both frequent occurring and with a high mortality, it seems underrated and has not gained much interest in prehospital care. We aimed to 1) investigate the diagnostic pattern and mortality for patients to whom an ambulance was dispatched due to difficulty breathing, and 2) investigate the initial symptoms and mortality for ambulance patients diagnosed with respiratory diseases at hospital.

Method
Observational historic population-based cohort study in the North Denmark Region 2012-2015. We included all patients calling the emergency number 1-1-2 with breathing difficulty as main symptom, and/or diagnosed with respiratory diseases at hospital following an emergency call.

Results
3 803 patients had an ambulance dispatched due to breathing difficulty. Their most frequent diagnoses at hospital were respiratory diseases 46.6 % (1 797), followed by circulatory diseases 13.4 % (510) and non-specific findings 12.0 % (459). Over-all 30-day mortality was 13.2%, and the rates were highest for circulatory diseases 18 %, respiratory diseases 12.9 %, and non-specific factors 9.2 %.
4 014 patients were diagnosed with respiratory diseases at hospital. The majority, 47.3 % (1 797), called 1-1-2 due to breathing difficulty, followed by unclarified problems 13.4 % (542) and chest pain/heart disease 11.3 % (454). For 16.7 % (653) a symptom was not registered, Over-all 30-day mortality was 12.7 %, with the highest, 19.1 % for the symptom decreased consciousness, followed by 13.1 % for unclarified problem, and 13.0 % for breathing difficulty.

Discussion
It is possible that patients with other symptoms than breathing difficulty could have experienced dyspnoea, as it is present in many conditions. However, we chose to limit our focus to the symptom breathing difficulty as the main

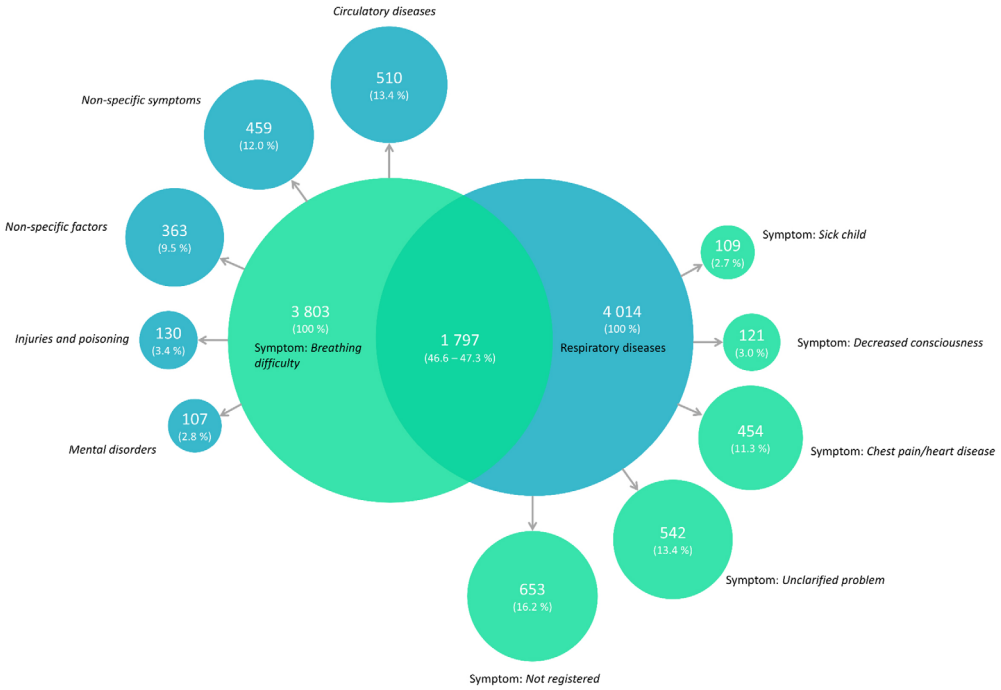
reason for dispatching an ambulance. It is also important to note that the symptoms were assessed by health care personnel at the Emergency Medical Coordination Centre over the phone, i.e. by personnel not seeing the patient in person. Similar to the few other existing international studies, we found that apart from respiratory diseases, heart diseases were prominent among prehospital patients presenting breathing difficulty. However, our study also revealed that non-specific diagnoses were frequently applied to patients with breathing difficulty.

Conclusion

In conclusion, this study showed that breathing problems and/or respiratory diseases among prehospital patients are closely related and both associated with high mortality. Respiratory and circulatory diseases were the most frequent among diagnoses given to patients where an ambulance was dispatched due to the symptom breathing difficulty. The number of non-specific findings and non-specific factors, alongside the high mortality rates, suggest that prehospital dyspnoea patients still appear to be an overlooked patient group.

Diagnoses	N	Percent
Respiratory diseases	*1 797*	*47.25*
DJ441: Chronic obstructive pulmonary disease with acute exacerbation, unspecified	*459*	*25.54*
DJ189: Pneumonia, unspecified	*363*	*20.20*
DJ449: Chronic obstructive pulmonary disease, unspecified	*185*	*10.29*
DJ960: Acute respiratory failure	*132*	*7.35*
DJ459: Asthma, unspecified	*110*	*6.12*
Circulatory diseases	*510*	*13.41*
DI509: Heart failure, unspecified	*57*	*11.18*
DI489: Atrial fibrillation or atrial flutter, unspecified	*53*	*10.39*
DI214: Non-STEMI	*36*	*7.06*
DI219: Acute myocardial infarction, unspecified	*31*	*6.08*
DI269A: Pulmonary embolism, unspecified	*30*	*5.88*
Non-specific symptoms	*459*	*12.07*
DR060: Dyspnoea	*143*	*31.15*
DR064: Hyperventilation	*91*	*19.83*
DR074: Chest pain, unspecified	*33*	*7.19*
DR539F: Malaise	*25*	*5.45*
DR559: Syncope or collapse	*18*	*3.92*
Non-specific factors	*363*	*9.55*
DZ039: Observation for suspected disease or condition, unspecified	*229*	*63.09*
DZ038: Observation for other suspected diseases and conditions	*36*	*9.92*
DZ768: Persons encountering health services in other specified circumstances	*21*	*5.79*
DZ035: Observation for other suspected cardiovascular diseases	*19*	*5.23*
DZ03: Medical observation and evaluation for suspected diseases and conditions	*11*	*3.03*
Injuries and poisoning	*130*	*3.42*
DS202: Contusion of thorax	*18*	*13.85*
DS223: Fracture of rib	*11*	*8.46*
DT783: Angioneurotic oedema	*5*	*3.85*
DS060: Concussion	*4*	*3.08*
DT784: Allergy, unspecified	*4*	*3.08*
Mental disorders	*107*	*2.81*
DF100: Mental and behavioural disorders due to use of alcohol : acute intoxication	*23*	*21.50*
DF419: Anxiety disorder, unspecified	*18*	*16.82*
DF410: Panic disorder [episodic paroxysmal anxiety]	*10*	*9.35*
DF102: Mental and behavioural disorders due to use of alcohol : dependence syndrome	*7*	*6.54*
DF101: Mental and behavioural disorders due to use of alcohol : harmful use	*5*	*4.67*
Remaining	*437*	*11.49*
Total	*3 803*	*100*

Primary diagnoses at hospital for patients with the symptom breathing difficulty. The most frequent primary diagnoses given at hospital. Includes 3 803 patients who had the symptom breathing difficulty at the 1-1-2 call and an ambulance dispatched. The five most frequent specific diagnoses are included for each main chapter, with percentage of their respective main chapter.



Symptoms and diagnoses overview. Diagram showing the relation between symptoms when calling 1-1-2 (green circles) and primary diagnoses given at hospital, following a 1-1-2 call and dispatched ambulance (blue circles). Shows number of patients and percentage of corresponding group. Circle sizes are relative to number of patient

Abstract 8

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Medforfattere	Henrik Alstrøm, Michael Mølmer, Ann Merete Møller

Titel	Precision of General Prehospital Triage Systems for Mass Casualty Incidents in Live Simulations

Introduction

When managing a mass casualty incident, triage systems are a decisive component1. Triage systems aims to reduce under- and overtriage and to use available resources in the best way. However, it is unknown which system has the highest precision at categorising the patients' level of urgency. Due to ethical considerations, randomised controlled trials are unfeasible in mass casualty incidents. Thus, live simulations become the best option to examine triage systems when trying to preserve validity. Therefore, the objective of this study is to review precision of general pre-hospital triage systems for mass casualty incidents through accuracy, under- and overtriage in live simulations.

Methods

Eligibility criteria were defined to include primary triage systems only. Furthermore, the studies included had to report accuracy or an outcome convertible to accuracy. Finally, they had to examine triage systems in a live simulation. Exclusion criteria were triage systems designed for a specific group of casualties or incidents and if the study was either a review, meta-analysis, letter or an editorial. The search strategy was created based on MeSH terms found in a preliminary search. There was used no restrictions on language and publishing year.. The results were synthesised on a narrative basis.

Results

Out of 37 relevant triage methods only six have been tested in live simulations. A narrative analysis of the included studies' characteristics showed substantial heterogeneity (figure 1). The three systems with the highest precision rates were Tverretatlig Akuttmedisinsk Samarbeid (using Triage Sieve and Paediatric Triage Tape Mode), Modified Simple Triage and Rapid Treatment, and Sacco Triage Method. Stratification of some of the study characteristics indicated that methodological differences influenced the results.

Discussion
The studies describing the systems all had substantial limitations. The three systems with highest precision all had a possible conflict of interest. All studies carried at least an unclear risk of bias. Furthermore, live simulation studies have considerable issues with validity and reliability. Nevertheless, it is important to continue research on this topic to improve patient safety in mass casualty incidents.

Conclusion
In general, the studies were too heterogenous to make any definitive comparisons or final conclusions. A standardised protocol for new live simulations is needed to make sufficient and comparable data. This is a necessary step if the most precise triage system is to be determined.

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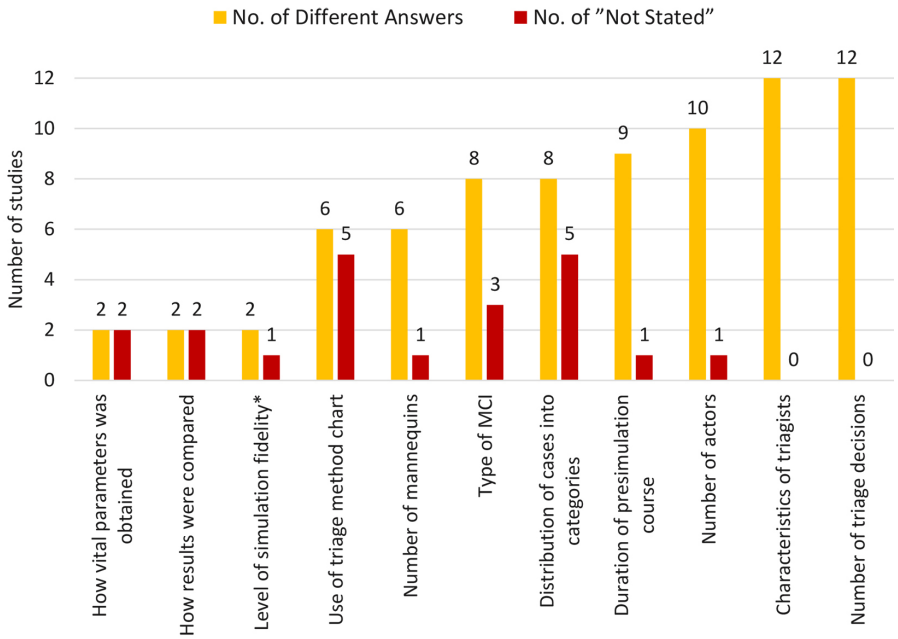
1: I., A., et al. Defining the problem, main objective, and strategies of medical management in mass-casualty incidents caused by terrorist events.



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Titel	Elevated microRNA-9 in cerebrospinal fluid is associated with poor functional outcome after subarachnoid hemorrhage

INTRODUCTION
Aneurysmal subarachnoid hemorrhage (SAH) has a relatively low incidence but affects younger individuals with a high mortality and a high frequency of complications in survivors. The underlying pathways that contribute to poor functional outcome are poorly understood. We hypothesized, that microRNA (miRNA) changes in cerebrospinal fluid (CSF) are associated with the occurrence of delayed cerebral ischemia and poor functional outcome after SAH.

METHODS
Using real-time polymerase quantification chain reaction (RT-qPCR), 43 selected miRNAs were studied in serial CSF samples from a discovery cohort of SAH patients admitted to a hospital in Copenhagen, Denmark, and compared to

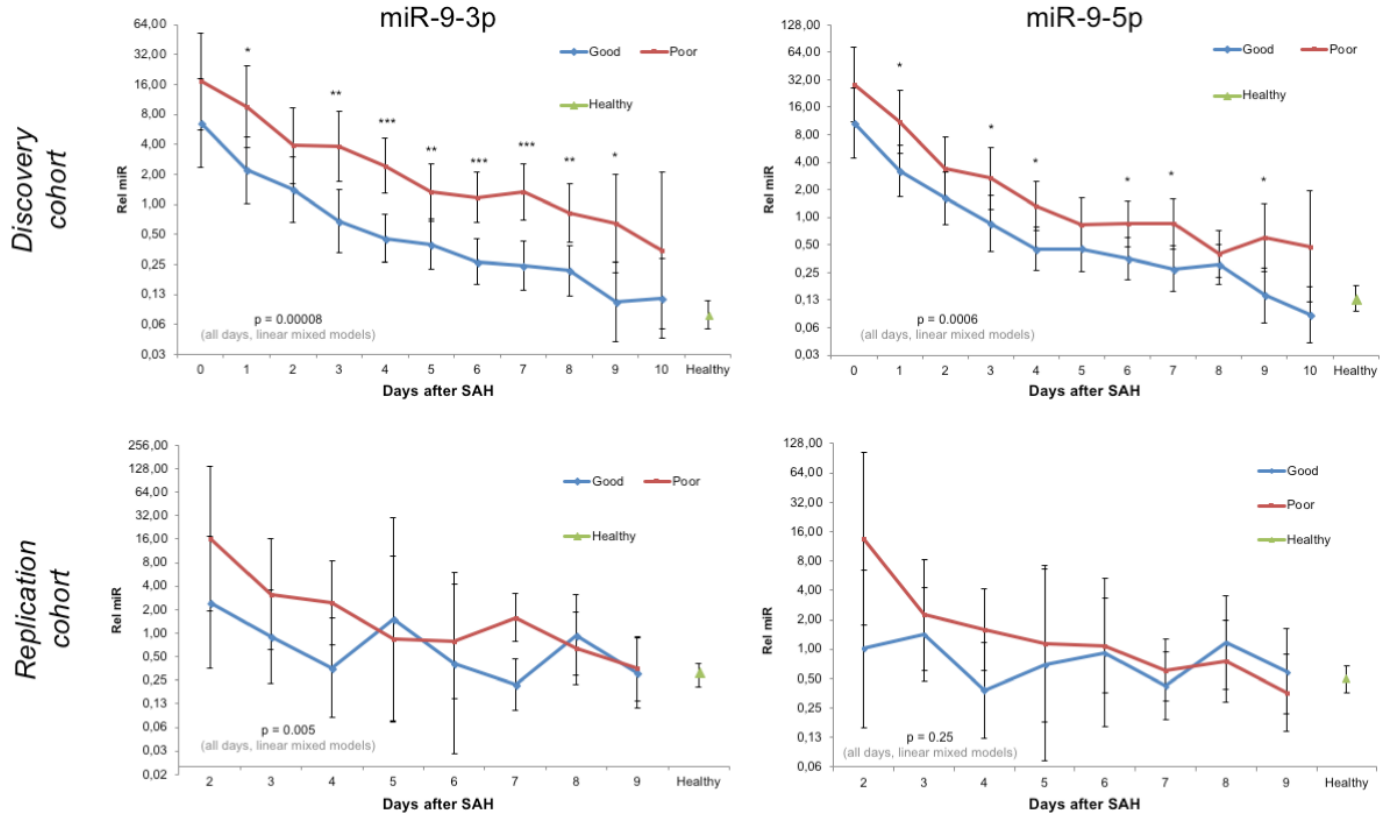
neurologically healthy patients. Findings were validated in CSF samples from a separate replication cohort of SAH patients admitted to a hospital in Boston, Massachusetts. Outcome measures were delayed cerebral ischemia, as well as functional outcome three months after ictus measured by the modified Rankin Scale (mRS) score.

RESULTS

MiRNAs were quantified and passed RT-qPCR quality control in 427 CSF serial samples from 63 SAH patients in the discovery cohort, in 11 CSF samples from 11 neurologically healthy patients, and in 104 CSF samples from 63 SAH patients in the replication cohort. None of the 43 miRNAs were associated with DCI in both the discovery and the replication cohort. Elevated miR-9-3p was associated with a poor functional outcome in the discovery cohort ($p < 0.0001$) after correction for multiple testing ($q < 0.01$) and in the replication cohort ($p < 0.01$). Elevated miR-9-5p was associated with a poor functional outcome in the discovery cohort ($p < 0.01$) after correction for multiple testing ($q < 0.05$).

CONCLUSIONS

Mir-9-3p is elevated in the CSF following SAH and is associated with a poor functional outcome.



Predicted daily levels of miR-9-3p (left) and -5p (right) in CSF from patients with a good (blue) and poor (red) functional outcome after three months included to the discovery (top) and replication (bottom) cohort. Far right in each graph the average daily levels in cerebrospinal fluid from neurologically healthy patients (green) included to the discovery cohort are shown. Error bars show 95% confidence intervals. Daily significant differences are marked with asterixes as follows: *, $p < 0.05$; **, $p < 0.01$, *** $p < 0.001$.
Rel miR, relative concentration; **SAH**, subarachnoid hemorrhage.

Abstract 32

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Titel	Endotheliopathy in major burn patients

Introduction

Vascular permeability increases markedly after severe burn injury. Shedding of syndecan-1 from the endothelial

glycocalyx, referred to as endotheliopathy of trauma (EoT), is associated with poorer outcomes. This study aims to determine if EoT is also present in the major burn population.

Methods
In this single-center retrospective observational trial (IRB: HSC-GEN-12-0059), 458 burn and non-burn adult trauma patients were enrolled at Memorial Hermann Hospital Texas, US, from July 2011 to July 2017. Patients that expired within 24 hours or received ≤800 ml of fluid resuscitation were excluded. Syndecan-1 on arrival was chosen as a biomarker of EoT. EoT was defined as a syndecan-1 level >40 ng/mL. Inhalational injury (II) was defined as evidence of airway or lung injury confirmed by bronchoscopy. Data are presented as median (interquartile range).

Results
Of the 458 patients enrolled, 68 suffered thermal injury. Burn patients were predominantly male (82.4 %) with an injury severity score (ISS) of 9 (4, 16). Patients had a total body surface area (TBSA) burn of 19 % with 27.9 % of the patients suffering II. Syndecan-1 levels (23 (15, 35) vs. 25 (13, 58)) were similar in the two groups. Mortality was similar between the two groups (11.8 % vs. 12.6 %), also when looking only at patients with EoT (21.4 % vs. 16.9 %). Concerning burn patients only, those with EoT had significantly more II (50.0 % vs. 22.2 %, p=.023). Patients with II had significantly higher ISS and TBSA compared to patients without II (p<.001 and p=.023). Iv fluids received at 24 hours and iv fluids exceeding predicted needs were significantly higher in patients with II (9461 vs. 4115, p=.001 and 139 vs. 1865, p=.001). Incidence of EoT and mortality was significantly different between the groups (36.8 % vs. 14.3 %, p=.024 and 36.1 % vs. 2.1 %, p<.001).

Discussion
EoT may be associated to II rather than percentage TBSA with increased fluid requirements and mortality. EoT is attributed to burn shock rather than the trauma mechanism with EoT burn and non-burn patients having similar mortality. The shock-induced effects on vascular permeability may explain for the increase in mortality in burn patients with EoT.

Conclusion
This study confirms that severe burn injury induces endothelial glycocalyx shedding similar to that seen in non-burn trauma. Patients with II had higher risk of EoT, higher ISS, fluid requirements, and mortality compared to patients without II.

References: Johansson, P.I. et al., Shock induced endotheliopathy (SHINE) in acute critical illness - a unifying pathophysiologic mechanism. Crit Care, 2017.
Johansson, P.I. et al., Traumatic Endotheliopathy: A Prospective Observational Study of 424 Severely Injured Patients. Ann Surg, 2017.
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Abstract C

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Medforfattere	Jacob Steinmetz, Mo Haslund Larsen, Josefine Bækgaard, Lars S. Rasmussen
Titel	Patient Experience of Spinal Immobilisation after Trauma

Introduction
Spinal immobilisation of blunt trauma victims with potential spinal cord injury is considered to be standard of care. The traditional management has, however, been increasingly questioned and concerns about harm have been raised (1). Few studies have described the perspective of the trauma patient regarding the spinal immobilisation.
The objective of this study was therefore to evaluate the patient experience of immobilisation in trauma through a semistructured interview.

Methods
We prospectively screened adult trauma patients admitted to a level 1 Trauma Center (Rigshospitalet, Copenhagen)

for eligibility. We included adult trauma patients who had been immobilised for spinal protection with a cervical collar and a spine board prehospitally or upon arrival to the Trauma Center.
A semistructured interview was conducted 2 to 72 hours after admission either in person or by telephone. Only awake and alert trauma patients, who recalled being immobilised and could speak Danish, were included.
The interviews were analysed by giving frequencies and percentages of specific statements.

Results
We screened 269 patients over 3.5 months. Ninety patients seemed eligible for inclusion based on the patient charts. We were unable to get in contact with five patients, two patients refused to participate and one did not return the consent form. Out of the remaining 82 patients, 42 (51.2 %) had no memory of being immobilised.
We included 40 patients with a median age of 39.5 years (IQR: 26.5-58.0) of whom 29 (72.5 %) were men. The median injury severity score was 8 (IQR: 3-12) and the median time with a cervical collar from initial application to in hospital removal was 88.5 min (IQR: 68.5-107.8).
Twenty-two patients (55 %) reported feeling informed about why immobilisation was done and 3 (7.5 %) experienced that the staff had difficulties with the application of the immobilisation. Sixteen patients (40 %) reported discomfort and 8 (20 %) experienced pain related to the immobilisation. Thirty-one patients (77.5 %) reported a sense of protection related to the immobilisation.
Anxiety and dyspnea related to the immobilisation were reported in 3 (7.5 %) and 3 (7.5 %), respectively.

Discussion & conclusion
Discomfort related to spinal immobilisation was reported in 40 % of trauma patients. However, a sense of protection was a recurring theme in more than 70 % of the trauma patients. More than half of the patients had no memory of being immobilised.

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1. Kornhall DK, Jørgensen JJ, Brommeland T, Hyldmo PK, Asbjørnsen H, Dolven T, Hansen T, Jeppesen E. The Norwegian guidelines for the prehospital management of adult trauma patients with potential spinal injury. Scand J Trauma Resusc Emerg Med. 2017 Jan 5;25(1):2. doi: 10.1186/s13049-016-0345-x. Review.

Abstract 22

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Titel	Supplemental Oxygen and Hyperoxemia in Trauma Patients. A Prospective, Observational Study

Introduction
Supplemental oxygen is recommended during the initial treatment of trauma patients according to several guidelines, but the supporting evidence is sparse. (1) We aimed to describe the use of supplemental oxygen and occurrence of hyperoxemia in the initial phase of trauma management at two level 1 trauma centers.

Methods
In this prospective, observational study we included trauma patients ≥16 years of age admitted to Rigshospitalet, Denmark (RH) and Massachusetts General Hospital, USA (MGH) during daytime over a four-week period. Data on pre-hospital and in-hospital supplemental oxygen, arterial oxygen tension (PaO2), and outcomes (in-hospital mortality, hospital- and intensive care unit length of stay) were collected.

Results
We included 56 patients. There were 22 (39%) females, and the mean age was 49 years (sd: 18). The mechanism of injury was blunt for 47 (84%) patients and penetrating for 9 (16%) patients. The median Injury Severity Score was 9 (IQR: 4-14, n=49). In the pre-hospital setting four (7%) patients were intubated and 52 (93%) were spontaneously breathing. A total of 23 (45%) out of 51 spontaneously breathing patients received pre-hospital supplemental oxygen,

but did not differ significantly from the 28 (55%) patients not receiving supplemental oxygen in terms of demographics, injury characteristics, pre-hospital oxygen saturation, or vital signs on admission except for oxygen saturation (Table). In-hospital, a total of seven (13%) patients were intubated, and 29 (59%) out of 49 spontaneously breathing patients were given supplemental oxygen. The median PaO2 was 26.5 kPa [IQR: 22.2-34.1] in four intubated patients and 12.3 kPa [IQR: 9.7-25.7] in patients with spontaneous respiration on supplemental oxygen. There was a significant difference between the two centers in the proportion of spontaneously breathing patients receiving pre-hospital supplemental oxygen (RH: 18 [64%]; MGH: 5 [22%], p=0.004) and of patients having supplemental oxygen continued in-hospital (RH: 18 [100%]; MGH: 3 [60%], p=0.040).

Discussion

Supplemental oxygen was supplied inconsistently, and spontaneously breathing patients with and without oxygen supplementation were not found to be significantly different in terms of injury characteristics and relevant vital signs. Supplemental oxygen can serve as an important therapeutic measure, however, in excess, it can also be harmful.

Conclusions

Approximately 50% of trauma patients received supplemental oxygen during the initial treatment. Hyperoxemia was common for patients treated with supplemental oxygen, and was most pronounced in intubated patients.

References:

1. Eskesen TG, Baekgaard JS, Steinmetz J, Rasmussen LS. Initial use of supplementary oxygen for trauma patients: a systematic review. BMJ open. 2018;8:e020880.

Table: Comparison of spontaneously breathing trauma patients with and without supplemental oxygen in the pre-hospital setting.

	Without pre-hospital supplemental oxygen n=28	With pre-hospital supplemental oxygen n=23	P-value
Female sex, n (%)	12 (43)	10 (43)	1.0
Age, mean (sd) [years]	49 (20)	48 (18)	0.78
Secondary transfers, n (%)	4 (14)	6 (26)	0.32
Mechanism of injury			
Blunt, n (%)	23 (82)	19 (83)	1.0
Penetrating, n (%)	5 (18)	4 (17)	
ISS, median [IQR] (n=44)	9 [4-12]	9 [5.5-18.0]	0.33
≤15, n (%)	17 (61)	16 (70)	0.49
>15, n (%)	4 (14)	7 (30)	
First SAT at scene, median [IQR] [%]	96 [95-98]	97 [96-99]	0.87
Vital signs on admission			
HR, mean (sd) [/min]	94 (20)	90 (16)	0.41
SBP, mean (sd) [mmHg]	140 (25)	139 (29)	0.91
SAT, median [IQR] [%]	97 [95-98]	100 [96.5-100]	0.02
RR, mean (sd) [/min]	19 (3)	18 (5)	0.42
GCS, median [IQR]	15 [15-15]	15 [14-15]	0.09

sd, standard deviation; ISS, Injury Severity Score; IQR, interquartile range; SAT, oxygen saturation (pulseoximetry); HR, heart rate; SBP, systolic blood pressure; RR, respiratory rate; GCS, Glasgow Coma Scale score

Abstract 10

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Titel Restrictive vs. Liberal Oxygen Therapy for Trauma Patients. PILOT: The TRAUMOX1 Trial

Introduction

In trauma patients, oxygen administration is standard of care, although the evidence behind is extremely sparse.(1) Hyperoxemia is thus commonly observed, although it has been associated with pulmonary complications and mortality in some patient populations.

The primary objectives of this trial were to evaluate whether maintenance of normoxia is feasible within the first 24

hours after trauma and to evaluate the incidence of 30-day mortality and major in-hospital respiratory complications (combined endpoint).

Methods

We undertook a randomized clinical trial of 41 adult trauma patients admitted to our trauma centre. Patients were randomized to 24 hours of either restrictive oxygen therapy (oxygen saturation target of 94%, n=21) or liberal oxygen therapy (intubated patients: FiO2 1.0 in the trauma bay, 0.8 elsewhere; spontaneously breathing patients: 15 l/min via a non-rebreather, n=20).

The intervention was initiated in the trauma bay as soon as a trial guardian had given proxy consent on behalf of the trial subject.

Arterial oxygen saturation was measured once every hour and at least four arterial blood samples were obtained.

Two blinded anaesthesiologists evaluated major in-hospital lung-complications (pneumonia, ARDS and ALI).

Results

The median Injury Severity Score was 10 (Interquartile range: 5-19) and 38 patients completed the 24-hour intervention while three patients dropped out after a median of 18 hours.

Overall, protocol compliance was high, as the median arterial oxygen tension was significantly lower in the restrictive group compared to the liberal group (10.8 kPa [9.7-12.0] vs 30.4 kPa [23.7-39.0], p<0.0001 (figures 1 and 2)). There were 44 episodes of arterial oxygen saturation below 94% in the restrictive group (median 92%, IQR [90-93]) and four episodes of saturation below 94% in the liberal group (median 91%, IQR [90-92]).

The combined primary endpoint occurred in 4/20 (20%) in the restrictive group and in 6/18 (33%) in the liberal group: two patients within each group died within 30 days and the incidence of major in-hospital lung complications was 2/20 (10%) in the restrictive group and 4/18 (22%) in the liberal group.

Discussion & Conclusion

Maintenance of normoxia using a restrictive oxygen strategy following trauma is feasible. On a larger study scale the 24-hour intervention could be shortened to ensure representation of only the acute phase post trauma. The pilot trial will serve as the basis for a large-scale study protocol.

TRIAL REGISTRATION: ClinicalTrials.gov Identifier: NCT03491644

References

1. Eskesen TG, Baekgaard JS, Steinmetz J, Rasmussen LS. Initial use of supplementary oxygen for trauma patients: a systematic review. BMJ Open. 2018 Jul 6;8(7):e020880.

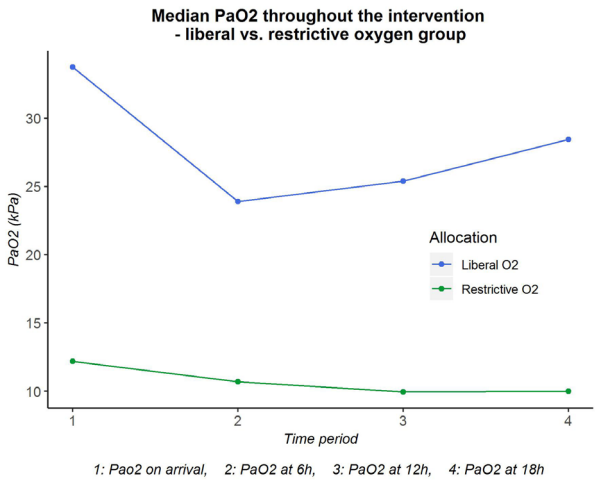

FIGURE 2

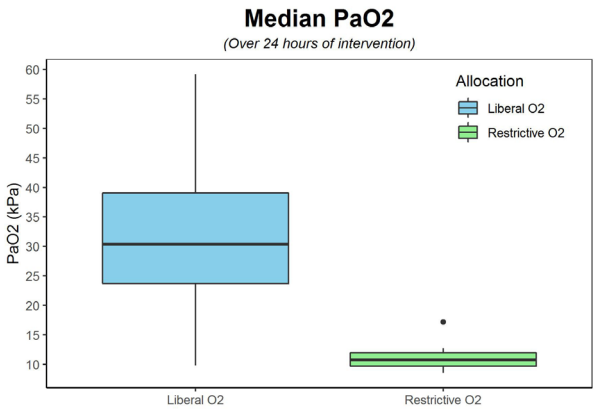

FIGURE 1
Median PaO2 with IQR
(Median PaO2 calculated for every participant followed by calculation of median PaO2 per group)

Liberal O2: FiO2 0.8-1.0 or 15 l/min via non-rebreather
Restrictive O2: target saturation= 94%