

Abstracts presented at the fifth symposium of the Belgian society of emergency and disaster medicine (Besedim)

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Abstract Nr: 1 Alternative devices to intubation for difficult airway management in the Emergency Department and in the prehospital setting: Fastrach[®] or Airtraq[®]?

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Introduction: Scientific recommendations for intubation advocate the provision of an alternative method in cases of difficult intubation. Intubation is frequently performed in the emergency departments and in the prehospital setting, two conditions with a particularly high rate of difficult intubations reported. It is therefore essential to have an alternative. There is no consensus on the alternative method of choice. We compared the success rate of endotracheal intubation of two devices.

Materials and Method: Using the PubMed database, we conducted a literature review using the keywords 'Fastrach', 'Intubating Laryngeal Mask', 'ILMA' and 'Airtraq.' Isolated reports and case studies on manikins were excluded, as well as those whose mode of use was particular (fiberscope, Trachlight[®], specific endotracheal tubes) or whose only endpoint was the time or a difficulty score of insertion. The variables were the number of patients, inclusion criteria, existence of a randomization, success rate of endotracheal intubation, qualification of the operator and location of use. We then conducted a meta-analysis.

Results: Sixty-two articles were selected. No studies have compared the two devices. The inclusion criteria were heterogeneous, each of the devices being used either as first-line or after failed intubation, intubation for any or only on the basis of predictive criteria for difficult intubation. The qualification of the operator was also variable (anesthetists, emergency physicians, nurses, novice or experienced).

Of the 25 articles on the Fastrach[®], 22 mentioned the success rate, including 11 randomized studies. Of the 37 items on the Airtraq[®], 15 studies reported a success rate of which 8 randomized. The median number of patients included in these studies was not different between Fastrach[®] (55) and Airtraq[®] (50). Overall, there was no significant difference in success rate of endotracheal intubation between Fastrach[®] (92.1%, n=1768) and Airtraq[®] (92.6%, n=1397). However, most studies were performed in the operating room. No studies have been conducted in the emergency department and only 5 in the prehospital setting (3 Fastrach[®], 2 Airtraq[®]). In this context, there is a significant difference ($p < 0.05$) between the success rate of the Fastrach[®] (92.1%, n=153) and that of the Airtraq[®] (57.1%, n=153).

Conclusions: Although both devices appear to be equivalent on manikins and in the operating theater, the Fastrach[®] offers a higher success rate of endotracheal intubation than the Airtraq[®] in the prehospital setting.

Abstract Nr: 2 Are adult patients who needed endotracheal intubation in the pre-hospital setting adequately ventilated and oxygenated during their transport to the emergency department?

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Introduction: Ensuring quality in pre-hospital airway management and ventilation is challenging because the out-of-hospital setting is an unpredictable environment. In literature, controlled studies in pre-hospital airway management and ventilation are scarce. This study was carried out to evaluate the adequacy of ventilation and oxygenation of pre-hospital intubated patients during transport to the emergency department (ED).

Materials and Method: With a retrospective cohort study, we analyzed all medical files of all patients who needed endotracheal intubation in the pre-hospital setting and who were ventilated and oxygenated during transport to the ED of a university teaching hospital between 1/1/2010 and 31/10/2012. Patients under the age of 18 were excluded.

Results: Files of 137 consecutive patients were analyzed. The most important reason for intubation was found to be a Glasgow Coma Scale below 8 (n=93). The most common reason of admission to the ED was resuscitation (n=61), followed by cerebral pathologies (n=34). In 47 patients (34%), imposed tidal volume, frequency, FiO₂ and PEEP were tracked in the patient's file. In 17 of these 47 patients these parameters were adjusted to the patient needs. In 52 out of 73 patients an FiO₂ of 100% was administered during transport while they had an O₂ saturation of 95% and up. After arrival at the ED, arterial blood gases (ABG) were drawn in 69% of patients (95 out of 137). The median door-to-ABG time was 48 minutes (range 2–221 minutes). The results of the 27 ABG drawn within 30 minutes after arrival at the ED revealed a respiratory acidosis with a mean pH of 7.26±0.16 and a mean pCO₂ of 47±12 mmHg. The average pO₂ in those patients was 255±119 mmHg. End tidal CO₂ (EtCO₂) was monitored in 22 patients (16%).

Conclusions: This study revealed not only that patients who needed endotracheal intubation in the pre-hospital setting were not adequately ventilated and oxygenated during subsequent transport to the ED, but also that only in a small share of the patients, the impact of the ventilation was adequately monitored. Ventilation and oxygenation must be adjusted to the patient's individual needs and must be guided by close measurements of O₂ saturation and EtCO₂. This policy has to be continued after immediate arrival at the ED with adjunctive ABG measurements.

Abstract Nr: 3 End-tidal carbon dioxide during chest compressions: are we measuring the right concentration?

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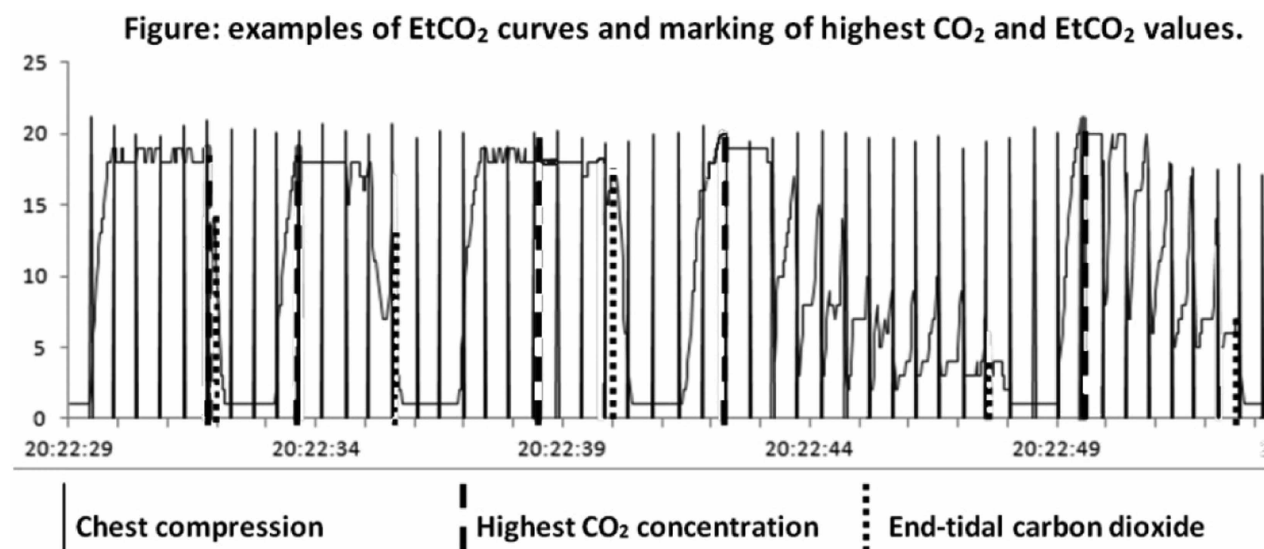
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Introduction: End-tidal carbon dioxide (EtCO₂) is used as a non-invasive parameter to assess the quality of chest compressions during cardiopulmonary resuscitation (CPR). Normally, EtCO₂ is measured at the end of the expiration when the exhaled CO₂ concentration reaches its maximum. During simultaneous chest compression and ventilation, however, chest compressions may push air out of the chest at the beginning of expiration, leading to higher CO₂ concentrations before the end of expiration. We compared the highest CO₂ concentration with the EtCO₂.

Materials and Method: We retrospectively analysed 51 intubated and resuscitated patients. EtCO₂ was recorded using a Zoll E Series defibrillator. Data were exported and analysed using Excel and Visual Basic. For each ventilation we marked both the highest CO₂ and the EtCO₂ value (see Fig.). The difference between both values was assessed with the Wilcoxon test and a difference of ≥ 5 mm Hg was considered clinically significant. Values are expressed as mean (range) or as number of patients/ventilations (percentages).

Results: The mean age was 66 years (26–89), 38 (75%) were male. The initial rhythm was asystole in 23 patients (45%), PEA in 15 patients (29%) and ventricular fibrillation in 13 patients (26%). Seventeen (33%) patients had return of spontaneous circulation. A total of 4453 ventilations were included, 87 (9–329) per patient. The mean highest CO₂ value was 27.7 mm Hg (4–83), the mean EtCO₂ was 26.4 mm Hg (2–82). In 49 (96%) patients a statistically significant difference was found between the mean highest CO₂ value and the mean EtCO₂. In 243/4453 ventilations (6%) the difference between the highest CO₂ value and the EtCO₂ was ≥ 5 mm Hg and in 112/4453 (3%) the difference was ≥ 10 mm Hg. In 16 (31%) patients the difference was ≥ 5 mm Hg and in 7 (14%) patients the difference was ≥ 10 mm Hg.

Conclusions: In one third of patients receiving simultaneous chest compressions and ventilations, the EtCO₂ underestimated the highest CO₂ concentration during expiration.



Figure

Abstract Nr: 4 Reversed airflow caused by thoracic compressions during resuscitation: a pilot study.

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Introduction: During resuscitation, once the endotracheal tube in place, compressions and ventilations are performed simultaneously. The effect of thoracic compressions on the ventilation flow is unknown. Thoracic compressions during the inspiratory phase of the ventilation may cause unexpected expiratory airflow, so-called 'reversed airflow', which could lead to inefficient ventilation. The purpose of this study was to determine the occurrence of this phenomenon and to quantify the volume of reversed airflow.

Materials and Method: We retrospectively analysed ten patients who were intubated and resuscitated by the Mobile Emergency Group. Eight patients were manually ventilated with a ventilation bag and two were mechanically ventilated. During ventilation, the pressure gradient over the endotracheal tube was measured using two air-filled catheters connected to an external recording device consisting of two pressure sensors, two amplifiers and a logger. Compression data were recorded using an accelerometer on a Zoll E series defibrillator. For each patient, pressure and compression data during one minute were synchronised and analysed in a spreadsheet application using Visual Basic. Volumes were calculated from the pressure difference between the catheters. All data are expressed as mean values (standard deviation; range).

Results: The mean age was 66 years (19; 30–88), seven (70%) were male. In five (50%) patients, return of spontaneous circulation (ROSC) was achieved. The mean tidal volume of the ventilations was 625 ml (69; 436–906). Reversed airflow was observed in nine patients (90%), with an average volume per episode of 120 ml (64; 46–364). This occurred in 91 out of the 151 ventilations (60%), on average two times per ventilation. Out of 319 compressions, 156 (49%) generated reversed airflow. The mean volume of reversed airflow and the mean minute volume in the ROSC and the non-ROSC group were 127 ml (60; 46–324), 190 ml (175; 65–365), 7.35 L (1.6; 6.5–12.6) and 9.54 L (2.4; 6.0–17.2) respectively. The compression depth and ventilation rate did not differ between both groups.

Conclusions: Thoracic compressions during ventilation generated reversed airflow in the majority of the patients. The significance of this phenomenon remains unclear therefore further studies are needed.

Abstract Nr: 5 Mean initial cerebral saturation during advanced life support in out-of hospital cardiac arrest patients, predictor of survival?

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Introduction: Currently it is impossible to predict return of spontaneous circulation (ROSC) during CPR. Using near infra-red spectroscopy (NIRS), cerebral saturation (rSO₂) can be measured during cardiac arrest. Parnia et al. investigated the feasibility of cerebral NIRS during CPR.¹ We measured rSO₂ during CPR in out-of-hospital cardiac arrest (OHCA) patients and compared the difference between mean rSO₂ of the first minute of advanced life support (ALS) in patients achieving ROSC to patients without ROSC.

Materials and Method: With Institutional Review Board approval, cerebral saturation was measured during ALS in 52 OHCA patients with no obvious traumatic cause of cardiac arrest. One sensor of the Equanox[®] Advance was applied at the right side of the patients' forehead when the medical emergency team arrived. The measurement was discontinued if the patient died or at arrival at the intensive care unit. ROSC is defined as ROSC more than 20 minutes. CPR data were collected using the Utstein CPR data registration. Mann-Whitney test was used to compare survivor and non-survivor data. Non-parametric testing was used according to the underlying data distribution and expressed as median (25th–75th percentile). Categorical

features were given in terms of percentages. Mann-Whitney-U tests were performed to compare the initial cerebral saturation values.

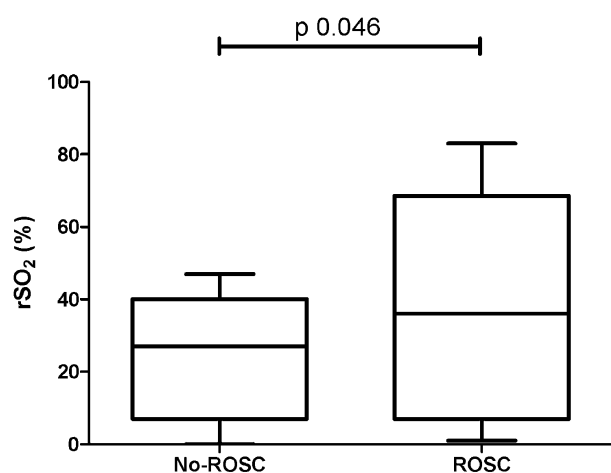


Figure 1

Results: Of the 52 patients, 22 patients achieved ROSC. Mean age in ROSC and no-ROSC group was respectively 72 yr (55–83) and 73 yr (61–79, $p=0.874$). (Table 1° In the group of patients with ROSC, 11 patients were male compared with 23 in the no-ROSC group ($p=0.046$). Cardiac arrest was witnessed in 15 patients in the no-ROSC group and in 17 patients in the ROSC group ($p=0.046$). A significant difference in duration between emergency call and start ALS is observed between ROSC and no-ROSC group, respectively 12 min (8–15) and 14 min (12–17; $p=0.031$). The mean initial rSO₂ was 27% (14–33) and 36% (14–52) respectively in the no-ROSC and ROSC group ($p=0.046$).

Table 1

	No-ROSC	ROSC	P-value
Number	30	22	
Age*	73 (61–79)	72 (55–83)	0.874
Male	23 (76.67%)	11 (50%)	0.046
Initial rhythm			
Asystole	20 (66.67%)	12 (54.55%)	0.375
VFib	6 (20%)	8 (36.36%)	0.189
PEA	4 (13.33%)	2 (9.09%)	0.636
Time call-ALS* (min)	14 (12–17)	12 (8–15)	0.031
Time call-BLS*¶ (min)	0 (0–3.75) (2 missing)	0.5 (0–4) (4missing)	0.554
Time collaps-BLS*¶ # (min)	3 (0–10)	2 (0–9)	0.984
Mean initial rSO ₂ * (%)	27 (14–33)	36 (13–54)	0.046
Witnessed arrest	15 (50%)	17 (77.27%)	0.046
Lay-rescuer BLS	20 (66.67%)	12 (54.55%)	0.375

*Expressed as median (25th–75th percentile)

¶BLS: BLS started by lay-rescuer, general practitioner or ambulance personnel

#Of 15 patients in the no-ROSC group time of collaps is unknown and of 5 patients in the ROSC group.

VFib=ventricular fibrillation; PEA=pulseless electrical activity; ALS=advanced life support; BLS=basic life support; rSO₂=cerebral saturation; Call=emergency call; ROSC=return of spontaneous circulation

Conclusions: A significant difference is observed in mean initial rSO₂ values of the first minute of ALS between patients with ROSC and no-ROSC during ALS in OHCA patients. Further research is necessary to confirm these observations.

References

- 1 Parnia S, Nasir A, Shah C, Patel R, Mani A, Richman P. A feasibility study evaluating the role of cerebral oximetry in predicting return of spontaneous circulation in cardiac arrest. *Resuscitation*. 2012;83(8):982–985. doi:10.1016/j.resuscitation.2012.01.039.

Abstract Nr: 6 Does leadership training improve outcome after cardiac arrest? A systematic review.

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Introduction: High quality advanced life support (ALS) is crucial to improve the outcome of patients suffering from cardiac arrest. Current ALS courses mainly focus on teaching knowledge and technical skills. ALS quality, however, is often insufficient because of procedural reasons (e.g. long time to defibrillation, long pre-shock pauses, large hands-off time). We performed a systematic review to assess if training specific leadership skills improves outcome after cardiac arrest.

Materials and Method: We performed a Pubmed search with the key words 'resuscitation' AND 'leadership' (August 2013), resulting in 153 hits. After screening the abstracts, 25 studies were retained for full review. Hand searching of the references generated another 17 articles of interest. After reading the 42 articles, 10 were retained for the final review. The GRADE methodology was applied.

Results: Only four out of the 10 studies involved real patients (one neonates), all other studies used manikins. To assess leadership performance, all studies used a different tool. Overall, a relationship was found between the lack of leadership (especially task assignment) and poor protocol compliance. In manikin studies, time intervals to complex technical skills consisting of several subtasks (time to defibrillation, pre-shock pauses, hands-off time) were clearly shorter when adequate team leadership was shown. In three randomised controlled manikin trials hands-on time during resuscitation correlated strongly with leadership skills. Two of these showed that only a brief instruction was effective to teach leadership skills successfully.

Two real-life observational studies in trauma patients found that time to intubation, time to the end of the secondary survey in the ATLS-protocol, and time to CT-scan were significantly shortened by improved leadership through training. None of these studies reported data on patient outcomes.

Conclusions: The evidence supports a positive effect of leadership training on procedural performance during resuscitation. Although improved procedural performance is known to improve outcome, a direct effect of leadership training on short or long-term outcome has not been demonstrated.

Abstract Nr: 7 Automated Learning with an Interactive Virtual Environment (ALIVE): Doing more with less.

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Introduction: At Ghent University Hospital (Ghent, Belgium) cardiopulmonary resuscitation (CPR) training of professionals currently consists of a single instructor-led course with a mean retraining time of 18 months. According to the literature, shorter training intervals are required to maintain proficiency, but more frequent training is costly and time consuming. At Ghent University, a novel educational approach called Automated

Learning with an Interactive Virtual Environment (ALIVE) was developed to achieve effective and more efficient CPR training. The method uses a manikin with sensors linked to interactive software. For retraining, the learning strategy consists of performing automated tests followed by feedback and feedforward, until success is achieved. The cost-effectiveness of this novel training method is not known. We compared the costs of a mobile ALIVE self-learning system (on the ward) to standard instructor-led retraining.

Materials and Method: We constructed an activity-based costing (ABC) model to compare the current instructor-led training program with ALIVE. In the model, 800 nurses would be tested and retrained on the ward with a mobile training system. Instructional costs were obtained from Ghent University Hospital. The main outcome measures were the yearly instructional cost per nurse and the yearly total difference in cost for the hospital. The costs included in the ABC model were: working hours lost for nurses while in training, working hours lost for instructors while providing training and differences in training material costs (manikin, computer program, development costs of ALIVE).

Results: The mean duration to perform the ALIVE tests and to achieve success was obtained from previous studies. Extrapolating those data resulted in an estimated overall success rate of 98% reached after 27 minutes, with a mean time of 13 minutes to succeed. The estimated 2% nurses unable to succeed through the ALIVE system, would need additional instructor-led remedial training, which was included in the ALIVE cost per nurse. The current ALIVE development cost was also included in the ABC model. Instructor-led retraining resulted in a yearly cost per nurse of 74 EUR compared to 13 EUR for ALIVE. For the hospital, this resulted in a total difference in cost of 48 383 EUR (based on 800 nurses).

Conclusions: The automated ALIVE method resulted in a highly cost-effective retraining strategy compared to traditional instructor-led retraining. Furthermore, since the general costs were calculated for 800 nurses, increasing the number of trainees would further reduce the training cost. Reducing training costs offers the possibility to train more people and on a more frequent basis.

Abstract Nr: 8 The Belgian National Overcrowding Study: a survey on Emergency Department sent to their Directors. Part 1: definition, frequency, causes and consequences of overcrowding.

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Introduction: In every Emergency Department (ED), overcrowding is a major international concern, leading to several adverse effects on both patients and careproviders. To date, few is know about current overcrowding situation in Belgium, mostly because scientific evaluations of overcrowding have rarely been specifically undertaken. Therefore, we designed the present study in order to evaluate the proposed definition and explore the frequency, potential causes and consequences of ED crowding in Belgium, based on the opinions of ED directors.

Materials and Method: Under the endorsement of the BESEDIM, a survey was electronically sent through the SurveyMonkey® instrument to the Belgian ED directors (n=110) between September 2012 and June 2013. It consists in a nationwide convenience questionnaire on a voluntary basis. The collected data were analysed anonymously.

Results: Out of these 110 questionnaires, 51 responses were obtained during the study period, representing 25 French-speaking and 26 Dutch-speaking hospitals. Respondent directors represented approximately 1.4 million ED visits (out of a total of 2.7 million ED visits for 2011). 71% of the respondents were working in general hospitals and 29% in university or university-affiliated hospitals. The mostly accepted definition of overcrowding was the situation in which the demand for emergency care exceeded the capacity of the ED to provide care within a reasonable time of 45 minutes (13 to 180 min) (median and range).

The main causes of crowding were related to:(1) the lack of beds for the in-patients (43/51, 84%); (2) the sending of patients at the ED by specialists or generalists to accelerate their hospitalization (32/51, 63%) (in

2011 an average of 34% of the hospitalisations have been performed via ED visits) (3) a large number of patients with non-urgent problems that could be treated elsewhere (27/51, 53%); (4) the limited available space inside the ED (21/51, 41%).

The consequences of crowding were: (1) increased stress among caregivers (34/51, 67%); (2) prolonged waiting time (28/51, 55%); (3) increased violence (24/51, 47%); (4) increased unsatisfied caregivers (22/51, 43%); and (5) increased waiting time before getting a bed for the in-patients (22/51, 43%). In 2011, around 33,000 patients left ED without being seen (renegeing).

Conclusions: This nationwide study is the first in Belgium with detailed causes and consequences of the overcrowding problem in emergency medicine. The results presented above are partial and preliminary. They show that overcrowding is seen as a major or a medium problem by 94% of ED directors who responded to the survey.

Abstract Nr: 9 The Belgian National Overcrowding Study: survey of Emergency Department Directors. Part 2: A way to emerge.

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Introduction: Emergency Department (ED) overcrowding is a major public health problem associated with deleterious effect on both patient and care givers. We aimed to determine which interventions were mainly used by the Belgian ED's directors to improve quality of care in crowded ED, and compare these interventions to evidence based solutions such as: to move emergency patient from ED to specific in-hospital waiting wards even if the room isn't yet free, to coordinate the in-patients discharge before noon or to re-schedule elective patients and surgical patients.¹

Materials and Method: Under the endorsement of the BESEDIM, a survey was electronically sent through the SurveyMonkey® instrument to the Belgian ED's directors (n=110) between September 2012 and June 2013. It consists in a nationwide convenience questionnaire on a voluntary basis. The collected data were analysed anonymously.

Results: We received 51 responses among the 110 questionnaires. Overcrowding was considered as a main problem by 94% of ED's directors. Several existing solutions have been pointed out: development of centralised bed management (93%), Short-Stay unit (92%); sending the patient coming in the ED directly to specialised consultation (60%), to out-hospital general practice (15%) or a recall system for nurses or doctors (30%). Moreover, some hospitals were able to accelerate the discharge of in-patients in order to facilitate ED's patient's hospitalisation (30%), while others have already activated an inhospital disaster plan (18%). Sometimes, ED's directors also reported internal improvements by duplicating beds in boxes, opening a second triage room, making a call to the hospital administrator to use booked places in the hospital, getting specialised advise to avoid hospitalisation (below 15%).

Conclusions: The results of this study suggest that ED's overcrowding has led ED's directors to implement several solutions in order to improve quality of care.

Among these interventions, several proposed improvements did not fit with evidence based solutions published elsewhere. Although Belgian's ED directors perceive that improvements are necessary, few long-term solutions and national policies are missing. These results highlight the need of research in evidence-based field.

References

- 1 ACEP, Emergency Department Crowding: High-Impact Solutions, September 8, 2009.

Abstract Nr: 10 Physician waiting time in the Emergency Department: do patients have realistic expectations?

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Introduction: Overcrowding in the Emergency Department is widespread throughout the world. With the increase in the number of patients, waiting times are rising. Patients' experiences of the physician waiting time (PWT) is one of the most important factors determining overall patient satisfaction. With this study we want to determine whether patients presenting to the Emergency Department (ED) have realistic expectations on the physician waiting time, in comparison to the time estimated as acceptable by the triage team and the real physician waiting time (PWT) and verify if these variables are dependent on features as age, gender, type of complaint, patients' age, education, presence of a caregiver who accompanies the patient and patient load at the time of admission.

Materials and Method: A prospective, monocentric, randomized, comparative observational study was done during daytime (9.00 a.m.–9.00 p.m.) when triage is performed, using the Manchester-triage-system, in a university hospital from October 19th until December 12th 2012. Patients were recruited and interviewed by a single researcher.

Results: A total of 500 subjects were included. 236 of them were patients, 264 were patients companions. Most respondents were female (n=316). The youngest participant was 16 years old, the senior 90 years. Most patients (n=258) had expectations regarding PWT that were significantly shorter (p<0,001) than was anticipated by the triage team and compared to the real PWT (p<0,013). Patients expectations were not significantly influenced by any variable, except for pediatric patients (p<0,031) and if the respondent was not the patient, but his companion or caregiver (p<0,006). Real PWT was significantly altered by the patient load at the time of admission (p<0,001) and the type of complaint: trauma patients have shorter PWT than medical patients (p<0,011). Also the real PWT is significantly shorter in comparison to the time set as goal by the triage doctor (p<0,001).

Conclusions: Patients do not have realistic expectations about PWT when presenting to the Emergency Department. Correcting these expectations and taking measures to change patients perceptions about waiting times, may improve patient and companion satisfaction.

Abstract Nr: 11 Clinical resident staffing review in an academic Emergency Department

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Introduction: Clinical resident staffing in the Ghent university hospital Emergency Department (ED) differs from classical ward staffing because of its larger fluctuations in patient inflow, but also because of this changing in-house resident availability. Patient inflow has a cyclical pattern, but a large variability. The in-house availability of residents is dependent upon the time of the day, but also on pre-hospital assignments and inter-hospital transfers, which can cause an unpredictable decrease in in-house residents.

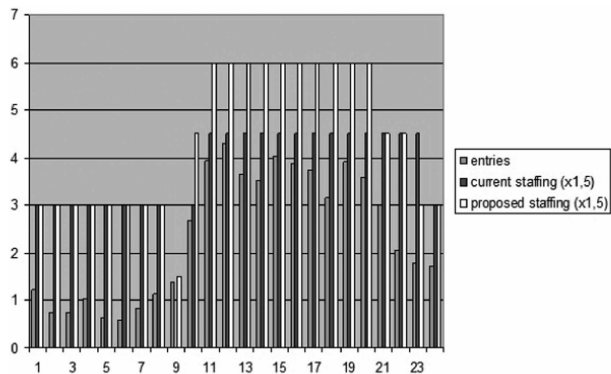
Materials and Method: A literature search on physician staffing in Web of Science, Pubmed and Google Scholar was performed and combined with the patient data available, the choice was made to use the ACEP-method (American College of Emergency Physicians), namely to base physician staffing on patients

entering the ED per hour. The ratio proposed by the ACEP is one physician per 1,8 to 2,8 patients registering patients per hour.

Results: To use the ACEP method in a tertiary training hospital in Belgium we needed to adapt the number of physicians per patients registering per hour to the different aspects:

- the different patient complexity
- the changing customer service expectations
- residents in training instead of experienced physicians
- the presence of boarding patients and patients under observation

This led to a target of 1,5 patients registering per hour per resident on average days to be able to counter peak moments or the loss of a resident to a pre-hospital task. The extra burden of the inter-hospital transfers was not taken into account.



Figure

Discussion: More complex methods exist to calculate necessary staffing in the ED (without pre-hospital function), but excessive data gathering is necessary, which was not possible in our current IT-system. No comparative research between different methods was found. Staffing of residents in the ED needs to be balanced between economical feasibility and teaching opportunities without creating a bottleneck on throughput and by taking the possibility of pre-hospital assignments into account.

Conclusions: Reviewing the current staffing by using an adapted ACEP-method indicated a possible optimization of resident staffing in the UZ Gent ED.

Abstract Nr: 12 Introducing a balanced scorecard to the emergency room of the UZ Ghent

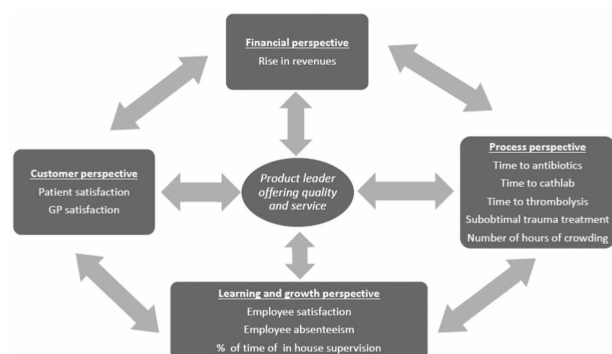
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Introduction: The rapidly changing environment of the emergency department (ED) increases the need for management tools to maintain and improve ED-performance. Often, Key Performance Indicators (KPI) are introduced to measure performance and quality. The balanced scorecard (BSC) combines financial with non financial perspectives and therefore forms the perfect format to be implemented as a strategic management tool in the ED. The outlining of a strategy precedes the creation of a BSC. The Ghent University hospital follows a product leader strategy. The strategy map and BSC follow the 4 classical perspectives: financial, customer, process and learning & growth to subdivide the introduced KPIs. Process indicators were created to support the KPIs.

Materials and Method: A literature review was conducted to identify the experience of using balanced scorecards and KPIs in hospitals and EDs and specific processes and outcomes that are included in our

strategy map. A search of English, French and Dutch language articles was performed in Pubmed, Web of Science and Google Scholar using a broad range of keywords. References were screened for added value. The used KPIs for the BSC were the result of elaborate discussions based on the results of the literature study while keeping the hospital strategy in mind.



Figure

Results: An example of a process indicator is the percentage of letters that is send to the general practitioner (GP) of patients seen in the ED. Improving this, should ameliorate the quality of care improve patient and GP satisfaction.

Discussion: The quality of the created BSC relies on the preparatory work of the strategy map, which is based on the vision, mission and strategy of the hospital and the ED. The success of the use of the BSC and KPIs in general relies on the frequent collection of data concerning the KPIs and the frequent re-evaluation of the KPIs itself and even more of the process indicators. The process indicators need to be a means to an end (the KPIs) and not a goal by itself.

Conclusions: The introduction of KPIs and process indicators in a balanced scorecard format offers the opportunity to create a dynamic management tool that not only has financial KPIs, but also includes other KPIs that are valuable to the ED. It offers transparency and accountability on ED priorities.

Abstract Nr: 13 Evaluation of a massive transfusion policy at an emergency department (ED).

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Introduction: Emergency physicians become familiar with the management of severe haemorrhage. We evaluated our local procedure related to the appropriate use of blood products in case of a massive transfusion. To our knowledge, such an evaluation has not yet been performed in an emergency setting.

Materials and Method: In 2010, we established an internal procedure detailing the conditions that lead to the triggering of a massive blood transfusion and its practical organisation. We retrospectively analysed the files of patients admitted to the ED for which the procedure was triggered. Various parameters for surviving and deceased patients were compared qualitatively using a chi-square statistical test and quantitatively using a Mann-Whitney test.

Results: 19 cases were screened over a 34 month period : 8 women and 11 men, averaging 53 years in age. In two third of the cases, they were admitted for severe polytraumatic conditions. Clinically, they were shocked (TAS of 86 ± 27 mmHg), with tachycardia (FC of 95 ± 30 bpm), and in acidosis (pH 7, $22 \pm 0, 16$) with lactic acid of 7 ± 5 meq/l. 11 patients out of the 19 (60%) were intubated in pre-hospital environment of whom 4 patients received cardio-pulmonary resuscitation. Haemoglobin levels at admission were $8, 3 \pm 2, 7$ g/dl.

Our procedure was triggered within 15 min in half of the cases, and within 30 minutes for 80% of the cases. The number of packed blood cells, fresh frozen plasma and blood platelets administered at the ED were respectively 3/1,5/6, for a total of 9/6,5/12 during the entire managements of patients. The vascular filling at the ED (colloids and crystalloids) was $1,2\pm 0,4$ litre. One gram of Exacyl IV was administered in 21% of cases. The procedure was fine-tuned according to the coagulation tests (Rotem/Multiplate) in 63% of cases, enabling the administration of 1 gram of fibrinogen for 4 patients.

8 patients died, 6 within 24 hour of admission of which 2 died at the ED. Cerebral death was objectified in half of the cases. The only variable statistically associated with the death is the occurrence of a pre-hospital cardiac arrest ($p=0,008$).

Conclusions: The policy of massive blood transfusion at the ED aims at patients that are severely sick and with high mortality. It seems to be very appropriate to set a procedure in line with international recommendations. Such a procedure must enable a rapid triggering, a proper matching of blood products, a limited vascular filling and a good collaboration with the blood bank. The qualitative analysis of the procedure suggests a number of improvements: administration of Exacyl and usage of the specific Rotem/Multiplate test.

Abstract Nr: 14 Does real life meet the legal criteria of mobile emergency care units' (MECU) planification?

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Introduction: Since 2002, public health authorities have programmed the number of MECU and their geographical distribution in proportion to the population and the theoretical response time. These criteria do they check in the real life?

Materials and Method: We conducted a retrospective multicenter study compiling data from 01/09/2012 to 28/02/2013 of 3 contiguous MECU. For each municipality, we found the number of actual MECU interventions (AMI), expected MECU interventions (EMI) based on the rate of the annual national MECU report applied to population data from the National Statistics Institute, median real time observed response time (ORT), median expected response time (ERT) based on Google Routes. The Chi2 test was applied to compare the number of interventions per municipality and the Wilcoxon test for time.

Results: 3197 interventions among 433,642 people in 29 municipalities were conducted or 36.6% more than expected ($p<0.001$). The number of interventions per municipality is not proportional to the population that resides in a majority (20/29) of cases, with extreme values ranging from 20% to 308%! Actual observed response times are usually significantly ($p<0.01$) shorter than those calculated. This result in a rate of 95% of the population actually reached in 10 minutes and just over 1% in 15 minutes instead of respectively 63% and 17% depending strictly by calculating the legal criteria.

Discussion: Calculation errors are related to the overlap of our data for two calendar years while using the population figures of 2011 as theoretical data. Using a median response time also induces inaccuracy. However, in view of our results, it would be useful to extend the analysis to the whole country and seek the causes that could explain this discrepancy.

Conclusions: In our region, real life does not meet legal criteria for programming and allocating MECU. Interventions are more numerous and more timely that programming provides.

Abstract Nr: 15 Are dutch hospitals prepared for chemical, biological or radionuclear incidents?

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Introduction: Being one of Europe's densest populated countries with multiple nuclear installations, a heavy petrochemical industry and also at risk for terrorist attacks, The Netherlands bear some risks for CBRN incidents. Our hypothesis is that local hospitals are not prepared to deal with these incidents.

Materials and Method: To evaluate this preparedness an observational cross-sectional study was performed. All 93 Dutch hospitals with an ED were sent an online survey on different aspects of preparedness. Apart from specific hospital data, information on: hospital disaster planning; risk perception; availability of decontamination units, personal protective equipment, antidotes, radiation detection, infectiologists, isolation measures and staff training were obtained.

Results: Response rate was 65%. Data of this responder group are presented. Although 59% of them estimated to be at risk for CBRN incidents this is only included in disaster plans in 41%. Only 35% has decontamination facilities (situated before or at the entrance in 83% of them) and 28% has appropriate personal protective equipment (PPE) available for triage and decontaminating team. Atropine is available in high doses in all centers but specific antidotes such as hydroxycobolamine, thiosulphate, prussian blue, DTPA or pralidoxime are less available (70, 56, 8, 14 and 34% respectively). 6% have radiodetection equipment with alarm function and 25% has 24/7 availability of a nuclear specialist in case of disasters. Infectiologists are continuously available in 61%. Individual isolation facilities are found in 12%. Chemical and nuclear risks in the vicinity of the hospital were significantly correlated with disaster planning, availability of specialised and trained personnel, decontamination facilities and PPE's.

Conclusions: There are serious gaps in hospital preparation for CBRN incidents in The Netherlands. Exposure and risk perception, however, promote preparedness. Financial aspects are the major drawback.

Table

Municipality	Inhabitants	AMI	EMI	AMI/EMI	p value	ORT	ERT	ORT - ERT
1	19634	260	106	245,3%	<0,001	4	3	1
2	12737	68	69	98,9%	ns	6	5	1
3	8688	57	47	121,5%	ns	5	3	2
4	19756	145	107	136,0%	<0,001	6	4	2
5	11414	190	62	308,4%	<0,001	5	3	2
6	3316	19	18	106,1%	ns	8	14	-6
7	24334	213	131	162,1%	<0,001	6	3	3
8	6897	55	37	147,7%	<0,01	5	3	2
9	16989	154	92	167,9%	<0,001	6	6	0
10	23236	191	125	152,3%	<0,001	6	7	-1
11	8749	84	47	177,9%	<0,001	7	10	-3
12	11557	101	62	161,9%	<0,001	6	7	-1
13	18047	140	97	143,7%	<0,001	5	7	-2
14	8627	74	47	158,9%	<0,001	7	10	-3
15	9319	73	50	145,1%	<0,01	9	24	-15
16	13597	86	73	117,2%	ns	8	10	-2
17	10120	101	55	184,9%	<0,001	3	4	-1
18	12366	72	67	107,9%	ns	10	21	-11
19	36349	249	196	126,9%	<0,001	8	12	-4
20	10760	13	58	22,4%	<0,001	9	19	-10
21	11241	48	61	79,1%	ns	7	9	-2
22	17367	159	94	169,6%	<0,001	8	10	-2
23	30692	217	166	131,0%	<0,001	9	9	0
24	16893	99	91	108,6%	ns	8	13	-5
25	22548	112	122	92,0%	ns	10	13	-3
26	9173	48	50	96,9%	ns	9	14	-5
27	18207	123	98	125,1%	<0,05	15	25	-10
28	11942	13	64	20,2%	<0,001	9	18	-9
29	9087	33	49	67,3%	<0,05	19	29	-10

Abstract Nr: 16 Are we better prepared for CBRN incidents than our African colleagues?

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Introduction: The risk for CBRN incidents is eminent worldwide, regardless borders, countries or continents. We think we're experienced in our wealthy industrial western world but are we really better prepared than our African colleagues? This study was performed to evaluate possible disparities.

Materials and Method: The results of an online survey on CBRN preparedness amongst Belgian and Dutch Emergency Physicians were compared with a similar survey amongst the physicians on the mailing list of the African Federation on Emergency Medicine.

Results: There were 637 European participants versus 101 Africans. The Africans had a significant higher rate of previous disaster training (76 vs. 49%) with a higher estimated knowledge on these incidents. They were significantly better trained in the use of personal protective equipment and decontamination. There was no significant difference in the use of radiodetection equipment. The African population had significant more males (69 vs. 54%), a positive factor for preparedness but scored lower for 2 other positive predictive parameters: mean age and prehospital activity.

Conclusions: Our African colleagues present a very good score compared with our high tech European group. Disaster Medicine education seems to be a key factor, illustrating the importance of a thorough and organised training.

Abstract Nr: 17 Average injury severity in bus mass casualty incidents

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Introduction: Bus incidents have a low incidence but they can create a mass casualty incident (MCI) which can stress the medical response capacity. The average severity of injuries sustained is an important factor in the management of a MCI. The ratio of severely injured victims requiring hospitalization to minimally injured victims not requiring hospitalization is referred to as the average medical severity factor (MSF).

Materials and Method: Bus incidents from 1990 to 2012 with more than nine injured victims were included. For this purpose PubMed, media and incident investigation reports were identified and cross-checked. Where possible the casualty rate (CR) and the mortality rate (MR) were calculated in addition to the MSF.

Results: It was possible to determine the MSF in 73 and CR and MR in 78 of 92 incidents. Bus MCIs produce much larger numbers of minor casualties compared with serious injuries and deaths (MSF <1 in 71% of the MCIs). MR related to the CR shows a negative correlation along two different slopes. The relationship of the MSF to the total number of deaths shows that the MSF more than doubles from 11 deaths.

Conclusions: The study sought to identify the MSF, CR and MR of bus MCIs for the period 1990 to 2012. Bus MCIs produce large numbers of minor casualties compared with serious injuries. No clear factors could be identified to explain the negative correlation between the MR and the CR. More data is needed to clarify these results. A central database for reporting MCIs could facilitate data collection that could be used by emergency planners to tailor medical response plans accordingly.

Municipality	Inhabitants	AMI	EMI	AMI/EMI	p value	ORT	ERT	ORT - ERT
1	19634	260	106	245,3%	< 0,001	4	3	1
2	12737	68	69	98,9%	ns	6	5	1
3	8688	57	47	121,5%	ns	5	3	2
4	19756	145	107	136,0%	< 0,001	6	4	2
5	11414	190	62	308,4%	< 0,001	5	3	2
6	3316	19	18	106,1%	ns	8	14	-6
7	24334	213	131	162,1%	< 0,001	6	3	3
8	6897	55	37	147,7%	< 0,01	5	3	2
9	16989	154	92	167,9%	< 0,001	6	6	0
10	23236	191	125	152,3%	< 0,001	6	7	-1
11	8749	84	47	177,9%	< 0,001	7	10	-3
12	11557	101	62	161,9%	< 0,001	6	7	-1
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14	8627	74	47	158,9%	< 0,001	7	10	-3
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17	10120	101	55	184,9%	< 0,001	3	4	-1
18	12366	72	67	107,9%	ns	10	21	-11
19	36349	249	196	126,9%	< 0,001	8	12	-4
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21	11241	48	61	79,1%	ns	7	9	-2
22	17367	159	94	169,6%	< 0,001	8	10	-2
23	30692	217	166	131,0%	< 0,001	9	9	0
24	16893	99	91	108,6%	ns	8	13	-5
25	22548	112	122	92,0%	ns	10	13	-3
26	9173	48	50	96,9%	ns	9	14	-5
27	18207	123	98	125,1%	< 0,05	15	25	-10
28	11942	13	64	20,2%	< 0,001	9	18	-9
29	9087	33	49	67,3%	< 0,05	19	29	-10

Figure

Abstract Nr: 18 Liege City Parade 2013: evaluation of the preventive plan.

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Introduction: City Parade is a mass gathering event involving vehicles diffusing loud techno music; the parade have assembled around 175000 persons in 2013. Such a number of participants require a specific medical preventive plan. We believe that the epidemiologic evaluation of such an event is pertinent because data concerning these events are lacking and we need to assess if the pre-established plan actually meets the on site needs.

Materials and Method: This was a retrospective study based on medical files recorded in the Advanced Medical Areas (AMA). These areas were strategically implemented along the Parade course. Data were collected during a 13-hour period (from 11 AM to 12 PM).

Results: Ten emergency physicians, 13 nurses and more than 100 paramedics were on duty in the (AMA) and in the mobile vehicles (SMUR, PIT and ambulances). All admissions (n=144, signifying an admission rate of 8.2/10000 participants) were included and triaged into several categories on the basis of their severity: U1, U2 or U3; for vital, non-vital but severe or benign emergencies. There were 4 U1, 60 U2 and 80 U3 patients. More than 80% of these patients were under the influence of drug or alcohol. Twenty-seven patients (4 U1, 16 U2 and 7 U3) required evacuation to a hospital emergency department. All of them were under psychotropic and/or alcohol influence. On an etiologic point of view, admissions consisted in medical, trauma or toxicological emergencies.

Conclusions: According the international literature, mass gathering events may account for very variable emergency admission rates from 4 to 441 per 10000 participants, depending on the type of event (concert, sports, marathon,). Indeed, participant age, ambient temperature, alcohol or drug consumption, as well as event duration may interfere. In the present cohort, the very high rate of patient under toxic influence was surprising, but undeniably linked with triage severity and further hospital admission rate. Alcohol or drug consumption should be under surveillance in order to reduce AMA and hospital admissions.

Abstract Nr: 19 Utility of Alvarado's score in diagnostic approach of the acute appendicitis in emergency department?

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Introduction: Overconsumption of medical imaging and lack of abnormalities in histological pieces of appendectomy, led to the development of several clinical scores, in order to define the clinical probability with more accuracy. Among these, the Alvarado's score, associating clinical and biological data, was recently proposed.¹ However, there has been several controversies as concerns the definition of cutoff values, as well as the validity of the score in ruling this diagnosis in or out.

Indeed, the cut off recommended to exclude the diagnosis has been set <5 (score from 1 to 4 vs from 5 to 10) while the inclusion cutoff was set >7 (1 to 6 vs 7 to 10).²

We wondered about the utility of this score in clinical practice to include or exclude the pathology.

Materials and Method: This was a retrospective study, including all adults patients (>16 years-old), admitted in operating room for clinically suspected acute appendicitis, from September, 2012 till March, 2013 ($n=52$ in the university hospital of Liège). The patients were distributed in various groups according to their Alvarado's score. The histological exam of the operation's piece was our gold standard to assert the diagnosis of acute appendicitis. Cutoff value to rule the diagnosis of acute appendicitis in was set at 7, while rule out cutoff was 5.

Results: Fifty-two patients with a preoperative diagnosis of acute appendicitis were included. Eight presented a score <5 , 44 ≥ 5 , 28 <7 and 24 ≥ 7 . The diagnosis was histologically confirmed at 50 patients (96%).

In this sample, the sensibility and the specificity of a cutoff score <5 to rule out the pathology were respectively 12% and 0%. Ruling the diagnosis in, when the score was ≥ 7 , was associated with a sensibility and a specificity of 48 and 100% respectively.

Conclusions: In this cohort, a score upper or equal to 7 proved to be interesting to diagnose acute appendicitis. A score lower to 5 was not reliable in the exclusion of acute appendicitis.

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Abstract Nr: 20 Local and regional anesthesia of the hand and of the wrist: Towards optimizing the management of wounds in emergency medicine.

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Introduction: Wounds of the hand represent 0.9% of admissions in our emergency department. Expert recommendations (SFMU-SFAR-2005) propose the anesthesia of the flexor sheath to the wounds of the

fingers except for the thumb. For wounds at other places, you must perform a trunk anesthesia at the wrist with, for the thumb, a double median and radial block, and for the 5th finger an anesthesia through the flexor sheath to be completed by an ulnar block, if necessary. These recommendations were not followed in our department so far.

Materials and Method: We performed a prospective study of the feasibility and effectiveness of these blocks made by a non-anesthetist emergency room physician. Patients with contraindication to local anesthetics, as well as those on anticoagulant and non-collaborating patients were excluded. Anesthesia was considered successful when the patient was suffering no pain at the suture.

Results: 40 wounds (13 hands and 27 fingers) were supported for a period of 4 months. Anesthesia was effective in 27 of 40 wounds, which is 67.5% of the cases. The cases where we were not successful are related to wounds located at the boundary of two areas of innervation (the thumb and thenar) for 12.5%, and for 15% are related to wounds of the fingers when we tested a block at the wrist. Infiltration of banks or ring anesthesia was then performed in addition. Eight blocks of the median nerve out of 12 were effective, 9 blocks of the radial nerve out of 14 and 2 blocks of the ulnar nerve blocks out of 4. The 9 blocks from the flexor sheath that we made were effective. One commissural anesthesia was performed and proved effective. Only one single uncomplicated case of Lidocaine side effects was observed.

Discussion: This study shows that local and regional anesthesia of the wrist are achievable by an emergency physician not specialized in anesthesia. This study is limited by the fact that the same physician performed all the blocks. These require a perfect knowledge of the anatomy of the various nerves involved. These anesthetics were effective in two thirds of the cases. These results lead to improve the knowledge and use of local and regional anesthesia for emergencies. This work has also enabled the development of an internal procedure to standardize the management of wounds of the hand in our service.

Conclusions: This study confirms the interest, feasibility and effectiveness to follow the recommendations of experts in the management of wounds of the hand. The specific learning of these techniques should be part of the training of future emergency room physicians.

Abstract Nr: 21 Monthly and seasonal variation in the prevalence of venous thrombo-embolism in hospitalized patients: do atmospheric or pollution parameters matter?

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Introduction: Conflicting results have been reported regarding monthly and seasonal prevalence of venous thrombo-embolism (VTE), as well as the potential role of atmospheric parameters or ambient air pollution. We designed the present study to evaluate monthly and seasonal variation of VTE prevalence among hospitalized patients in a University Hospital in Belgium. The second objective was to correlate this prevalence to meteorological and air pollution data.

Materials and Method: This study was based on the retrospective evaluation of VTE events, as identified by ICD-9 code, among all hospitalized patient in Liège University Hospital, from 2006 to 2011.

The prevalence of the disease was determined together with 95% confidence interval of Poisson distribution. Monthly meteorological data and ambient air pollution parameters were obtained from local weather station. These data included temperature, humidity, atmospheric pressure, carbon monoxide (CO), ozone (O₃), sulfur dioxide (SO₂), nitrogen dioxide (NO₂), increase in particulate matter ≤ 2.5 and ≤ 10 μm (PM 2.5 and PM 10).

Results: During the study period, we identified 2664 VTE patients among the 226150 hospitalized patients. Overall VTE prevalence was 1.18% (CI=1.13–1.22). Monthly prevalence was significantly increased in April (1.33%, CI=1.17–1.5) and November (1.34%, CI=1.19–1.51). We found the lowest humidity level in April

(69,03%), while barometric pressure was at the lowest in November (1016,87 hPA). As concerns ambient air pollution, we noticed a high PM10 level (39,16 microg/m³) in April.

Conclusions: As reported in previous works, results from the present study are consistent with monthly and seasonal variability of VTE prevalence among hospitalized patients, with two peaks in April and November. While low air humidity and high PM 10 levels may play a role in April, low barometric pressure could be involved in November. Future studies should focus on the understanding on the underlying mechanisms behind such observations, but clinicians should be encouraged to reinforce VTE prevention during these high-risk period.

Abstract Nr: 22 Acrylonitrile intoxication after the Wetteren railroad accident: a case report.

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Introduction: Acrylonitrile (AN) is a volatile toxic liquid monomer used in industry. AN undergoes metabolism by two pathways: glutathione conjugation and oxidation by cytochrome P450. One of the products of the oxidative pathway is cyanide, which is a mitochondrial toxin and rapidly lethal. Cyanide has been implicated in AN-induced mortality and intoxications have been successfully treated with cyanide antidotes (Arch Toxicol 2005;79:610–4). However, although it may play a role in acute toxicity of AN, cyanide is not considered to be solely responsible.

Case report clinical presentation: An unconscious woman (76y) was intubated and mechanically ventilated by a mobile emergency group. On hospital arrival, she was resuscitated because of extreme bradycardia and hypotension. Coming from an AN railroad accident area and already having a typical bluish skin color and smell of almonds, acute toxicity by AN inhalation was suspected. On ICU arrival an arterial blood sample revealed a pH of 6.85, an anion gap of 24 mmol/L and a lactate level of 9.4 mmol/L. ECG showed sinus bradycardia.

Ventilatory support was continued with high FiO₂. Inopressors were administered, as well as bicarbonate. The patient was treated IV with 5g of hydroxocobalamin (Cyanokit), twice 12.5 g of sodium thiosulfate, and N-acetylcysteine (300 mg/kg). After the antidote treatment the patient's general condition improved considerably; she was extubated 24 h later and left the hospital without sequelae. A (sub)lethal blood cyanide level of 4.8 µg/mL was documented.

Literature Key-points: Management of AN toxicity is based on its metabolism via two pathways (Arch Toxicol 2000;74:184–9). AN is directly detoxified by conjugation with glutathione: depletion of hepatic glutathione is the basis of the therapy with N-acetylcysteine, to replenish glutathione stores. The oxidative pathway is connected with cyanide formation. A high FiO₂ appears to have a strong positive effect and is unlikely to cause harm. Direct binding agents (hydroxocobalamin) are based on cobalt chemistry and chelate cyanide directly to form cyanocobalamin. Second, the normal route of detoxification is conversion of cyanide to thiocyanate, with sulphur normally contributed by glutathione. However, sodium thiosulphate will also contribute sulphur. Nitrites (to form cyanmethaemoglobin) are relatively contraindicated in smoke inhalation, as combustion products will contain carbon monoxide too (Occup Med 2004;54:82–5).

Conclusions: After suspected severe AN toxicity, appropriate first aid measures should be taken and N-acetylcysteine, supplemented by specific cyanide antidotes immediately administered. Although the patient was comatose, in severe metabolic acidosis and cardiovascular collapse, and had a potentially lethal blood cyanide level, these treatments seemed to be effective.

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Abstract Nr: 23 ‘Easy, the patient is crazy!’ Or not?

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Introduction: Anti-NMDA (Anti-N-Methyl-D-aspartate) receptor encephalitis is a severe, treatable and potentially reversible auto-immune disorder. Symptoms range from psychiatric symptoms, memory issues, speech disorders, seizures, involuntary movements, to decreased levels of consciousness and breathing. It is often not recognised and easily mistaken for a new psychiatric diagnosis. Early recognition by emergency physicians can prevent mortality and diminish morbidity.

Case report clinical presentation: A 20-year-old Caucasian female presented with confusion, agitation and paranoia of acute onset. Her past psychiatric and medical history was unremarkable. There was no medication or drug abuse. Neurological examination, blood analysis and brain CT were normal. The patient was admitted to a psychiatric ward. Rapid progression to stupor with catatonic features and additional neurological advice took place. Given the age and female gender anti-NMDA encephalitis due to an underlying teratoma was considered but abdominal ultrasound was negative. Development of a pneumonia required intubation and ICU admission. Epileptic seizures were treated with high doses of anticonvulsants. Brain MRI was normal and lumbar puncture was negative. An abdominal CT was suggestive for ovarian teratoma, anti-NMDA receptor bodies were detected in the CSF.

Literature Key-points: Most patients with anti-NMDA receptor encephalitis develop a multistage illness with initially non-specific flu-like symptoms that are followed by a psychotic phase with disorientation, confusion, paranoia, hallucinations and memory deficits. Dyskinesias (especially orofacial), ataxia, seizures and decreased level of consciousness may follow. Later cardiac arrhythmia, hypotension and hypoventilation may occur. Most frequently women (81%) and predominately younger people (36%) with an average age of 19 y. Diagnosis is often delayed due to resemblance to other conditions such as: infectious encephalitis, other auto-immune aetiologies, neuroleptic malignant syndrome, lethal catatonia, cerebral tumours, metabolic disorders, psychiatric disorders and drugs/toxins or withdrawal. Treatment involves removal of tumour if present and immunosuppression, with steroids and intravenous immunoglobulin.

Conclusions: Anti-NMDA encephalitis should always be considered in patients presenting with psychosis as well as dyskinesia, seizures, and/or catatonia, especially if there is no history of a psychiatric disorder.

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Abstract Nr: 24 Hanging by a thread

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Introduction: If you think you're completely safe hanging in the air strapped in a climbing harness, you are wrong! There is an insidious threat of the hanging harness syndrome (HHS), a life-threatening medical emergency which leads to (pre)syncope.

Case report clinical presentation: A 64-year old Caucasian female lost consciousness after working 1 hour under a glass dome hanging in a climbing harness. It was a sunny day and temperature under the dome was high. It took one hour before she could be released by the fire brigade. During that time she never regained consciousness. Without previous medical history, she presented with signs of shock and heat stroke (42°C). Clothing was removed and cooled intravenous fluids were given. On arrival at the emergency department vital signs were pulse of 142/min, BP 168/89 mmHg, a central body temperature of 39,9°C and

a GCS of 8/15. Clinically, we noted red, overheated arms, hands and knees. Pupils were equal and reactive to light. There were no signs of neck stiffness. Initial blood results showed mild renal impairment, bicarbonate of 17,1 mmol/L and creatine kinase of 333 U/L. CT scan showed no signs of cerebral stroke or edema. Because she remained unconscious, she was intubated, ventilated and admitted to the ICU. She was sedated with daily wake-up. She developed rhabdomyolysis treated with forced diuresis, acute liver dysfunction, acute kidney injury without need for dialysis and thrombocytopenia without soft tissue bleeding. Empirical antibiotic treatment consisted of amoxicillin-clavulanate for aspiration pneumonia. Levetiracetam was started and terminated after serial EEG's showed no signs of epileptic activity. Neurological adequacy and extubation was achieved after 5 days. At discharge blood results showed normalization of coagulation parameters, improving liver and kidney function, platelet count and infectious parameters.

Literature Key-points: The HHS, also called suspension trauma or harness-induced pathology, occurs when a victim is suspended motionless in a vertical position for an extended period. The pathophysiology is related to relative hypovolemia induced by reduced venous return and vagal stimulation. Symptoms of HHS include presyncope which can lead to unconsciousness.^{1,2} To avoid or delay symptoms of HHS people in suspension should move their legs to increase venous return and elevate them to a semi-recumbent position. Specific design of harness and foot slings can diminish the risk for HHS. Healthcare workers should follow the current advanced life support guidelines without modification.²

Conclusions: HHS is a potentially life-threatening medical emergency. The primary goal during rescue/resuscitation should be the prevention of medical complications. People using a harness should be aware of the possible dangers and never act alone. Prompt rescue or quick release from suspension in an emergency situation should always be possible. In this case a speedier rescue could probably have prevented the additional complications of heat stroke.

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Abstract Nr: 25 Successful outcome after long hypothermia induced circulatory arrest, treated with Extra Corporal Life Support (ECLS)

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Introduction: Accidental hypothermia is associated with significant morbidity and mortality. However adequate prehospital triage and transfer of selected patients to centers with extracorporeal rewarming facilities may lead to good neurological outcome in hypothermia induced circulatory arrest.

Case report clinical presentation: A 58-year-old patient was found with a core body temperature of 24° Celsius. On arrival of the medical emergency team she developed circulatory arrest due to asystole. ALS was started and she was transferred to our hospital after 120' of resuscitation.

155 minutes after the onset of asystole a veno-arterial ECLS was started at the OR. At a core temperature of 28°C a successful defibrillation was established. The patient was transferred to the ICU and her body temperature was kept under 34°C for 24 hours.

After slow rewarming, sedation and ECLS support were stopped after 39 hours (without ECLS related complications). She regained full consciousness and brain MRI revealed no abnormalities. The longer length of hospital stay (22 days) was due to surgery for frostbite wounds.

Literature Key-points: Hypothermia is defined as a core temperature (measured in the distal third of the esophagus) of lower than 35°C. Clinical distinction is possible in prehospital setting: patients with shivering

will probably have mild hypothermia, comatose patients with stable hemodynamics are usually in moderate hypothermia and deep hypothermia patients (<28°C) present with signs of pulmonary edema, oliguria, coma and hypotension. The latter group has a major risk for circulatory arrest.

The initial treatment consists of evacuation of the patient out of the cold environment. Cautious manipulation is important, as even the slightest trigger may cause arrhythmias. ALS guidelines are equal as in normothermic circulatory arrest though the heart often fails to respond to medication, pacing and defibrillation. Adequate (warmed) fluid resuscitation and frequent assessment of electrolytes is mandatory. Vasopressors should be used with caution due to the risk of arrhythmia and increased severity of frostbite. As cerebral metabolism declines, survival rates of 47–63% (without neurological sequelae) are reported in ECLS treated patients, supporting the idea of early transfer to expert centers.

Prolonged hypothermia post resuscitation, may have a beneficial effect on neurological outcome. Early in-hospital, cut off potassium levels >12 meq/l or persistent asystole above 32°C are useful criteria for withholding ALS.

Conclusions: Full recovery after hypothermia induced cardiac arrest is possible, if hypoxia occurs after hypothermia and there is no underlying disease or trauma. Adequate patient selection and fast referral to a specialized center for invasive rewarming and eventually ECLS avoid complications and enhance survival.

Abstract Nr: 26 A quick high before immersion into the deep blue: the fall of Icarus revised.

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Introduction: Since the late 1970s, inhalation of volatile nitrites has been used for recreational use, leading to euphoria, desinhibition and enhanced sexual performances. Users call them poppers from the noise made when the glass vials are crushed prior to inhalation. Poppers use has been associated with presentation to the emergency department for acute toxicity, as reported in the present case.

Case report clinical presentation: We report the case of a 20-year old man admitted to the Emergency Department with complaints of nausea, vomiting and dizziness. He reported recreational inhalation of poppers, with 10 inhalations during a 15-minute period. Physical examination highlighted a deep cyanosis, despite oxygen therapy, but a normal cardiopulmonary examination. Pulse oxymetry revealed a low SaO₂ at 84%. The colour of the arterial blood sample was chocolate brown and gas analysis indicated a normal PaO₂ at 346 mmHg, an oxyhaemoglobin level at 61% and a methaemoglobin rate of 38.2%. Lactate was 154 mg/L. Troponin I measured was less <5, ECG and thorax radiography were both normal.

The patient benefited from a 2 mg/kg methylene blue infusion, leading to rapid cyanosis disappearance and complete recovery. No secondary rise in methaemoglobin occurred and the patient was discharged 24 hours later without complications.

Literature Key-points: Methaemoglobinaemia is a rare, potentially life threatening, condition. Recent reports have pointed out the occurrence of methaemoglobinaemia related to recreational drug such as volatile nitrites (poppers). Fortunately, such presentations are scarce. Indeed, in a comprehensive review, Hunter et al. found 25 articles describing methaemoglobinaemia secondary to poppers use. However, like Icarus, these patients may perish in their desperate attempts of getting high.

Conclusions: These patients typically present discordance between severe cyanosis and normal high PaO₂, with chocolate brown arterial blood sample. Clinician should be aware that conventional two wavelengths pulse oxymeters are not reliable for oxygen arterial saturation monitoring in these conditions because of their inability to distinguish oxyhaemoglobin from methaemoglobin. This specific feature is responsible for the existence of a saturation gap between oxygen saturation on the pulse oxymeter and the calculated haemoglobin oxygen saturation, which may, in turn, evoke this diagnostic.

Physicians need to have a high index of suspicion in case of sudden cyanosis with low oxygen saturation despite oxygen therapy without subjacent cardiopulmonary pathology, but eventually a history of drug consumption.

Treatment with methylene blue, in a dose of 1–2 mg/kg in 5–10 min, should be initiated promptly in patients with methaemoglobinaemia higher than 20% or symptomatic.

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Abstract Nr: 27 The artery of Percheron, does the emergency physician knows where it is.

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Introduction: Percheron infarction is a rare presentation of coma. The artery of Percheron, characterized by a single arterial trunk that irrigates both paramedian thalamic regions, can be occluded as a result of embolic diseases leading to bilateral paramedian thalamic infarcts. Clinical and image findings of this uncommon form of posterior circulation infarct are presented along with their anatomic and pathophysiologic correlates.

Case report clinical presentation: A 51-year-old Caucasian man was found by his wife sitting unconscious at a table. Last contact with him was six hours before.

The man was breathing normally, had a heart rate of 70 bpm and a blood pressure of 134/72 mmHg. The bedside glucose was 112 mg/dl and CO was not recorded. His GCS was 3/15 with normal sized pupils, reactive to light. His reflexes were normal but had a bilateral Babinski sign. He was intubated without drug administration. ECG, blood sample and chest radiography were performed immediately. A CT-scan of the brain without contrast was performed within 30 minutes. Results gave no explication for the coma. Meanwhile the neurologist examined the patient and ordered a magnetic resonance imaging (MRI) and MRI angiography, resulting in the diagnosis of bilateral thalamic infarction (fig. 1). No improve in vegetative state of the patient was observed and he died several hours after admission.

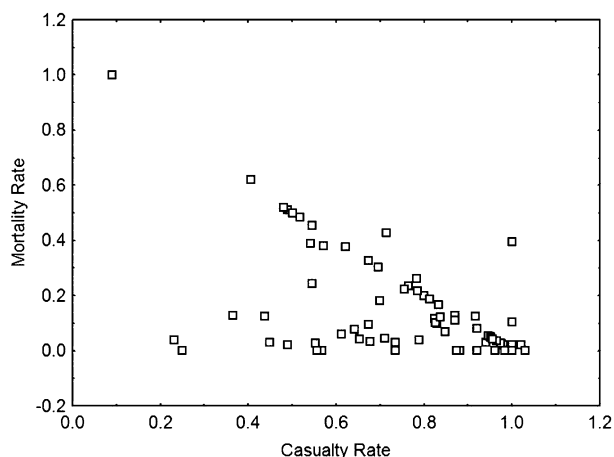


Figure 1 Left: Diffusion-weighted imaging, Right: Apparent diffusion coefficient image demonstrating the same lesions with diffusion restriction

Literature Key-points: Typical features of this stroke syndrome are altered mental status and memory impairment. The third feature of the triad is vertical gaze palsy. Some patients may also have oculomotor nerve palsy and hemiplegia. Artery of Percheron infarcts account for 0.1 to 0.3% of all ischemic strokes and 22 to 35% of all thalamic infarcts. Early diagnosis is best made by a diffusion-weighted imaging (DWI) sequence using MRI.

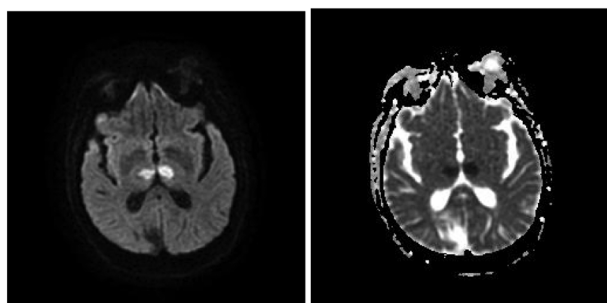
Conclusions: Percheron infarction is an unusual presentation of coma and not known by a lot of emergency physicians. Evaluation should be conducted by an interdisciplinary team including emergency physicians, neurologists and radiologists, hence the diagnosis may be delayed and the therapeutic window for thrombolytic therapy can be missed, resulting in significant neurological impairment or death.

Abstract Nr: 28 An unusual cervicalgy

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Case report clinical presentation: We report the case of a 47-year-old woman admitted in the emergency department with pain localized to the left and anterior side of the neck. This symptom was briefly preceded by dry cough and rhinorrhea, without any fever reported. The patient has previously been treated with oral amoxicillin-clavulanate for 3 days without improvement. Physical examination at admission revealed an isolated left tenderness overlying the left carotid artery, exacerbated by the touch. Laboratory findings demonstrated normal C-reactive protein level and peripheral blood cell count. An ultrasound investigation revealed a hypoechoic thickening of the carotid bulb wall, with no haemodynamic disturbance in Doppler study. Outcome was favourable under nonsteroidal anti-inflammatory drugs. One-month follow-up revealed an uneventful clinical course with complete ultrasound remission.



Figure

Literature Key-points: Fay *et al* first used the term ‘carotidynia’ in 1927 to describe an unilateral neck pain syndrome associated with tenderness over the carotid artery, exacerbated by digital compression, lateral head movement and, sometimes, chewing, swallowing, yawning, sneezing and coughing¹. The International Headache Society initially classified this clinical entity as an idiopathic neck pain syndrome, but further considered it as a symptom-only condition. Ultrasonographic exam reveals a hypoechoic wall thickening of the artery without haemodynamic changes in Doppler velocity. MR imaging may confirm these anomalies by showing contrast-enhanced tissue surrounding the carotid artery and increased signal on T2-weighted images, corresponding to focal glucose hypermetabolism. Several publications have studied the structural changes characterised by a focal eccentric thickening of the carotid wall. Indeed, structural modifications seem to be limited to the adventitia. Conventional laboratory testings are usually normal.

Conclusions: The aetiology of carotidynia remains unknown although some authors have suggested that carotidynia may develop after upper airway infections. The treatment remains largely symptomatic with anti-inflammatory drugs and eventually additional oral steroids.

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Abstract Nr: 29 Bluish vomiting: a diagnostic challenge of poisoning

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Introduction: Bluish vomiting is a rare form of poisoning presentation in an emergency department (ED). Consequently, physicians are not aware of the diagnosis, complications and treatment of this unusual form of poisoning.

Case report clinical presentation: A 65 year old man was admitted to the ED after ingestion of an unknown liquid contained in an opaque bottle. He was working in his garage and decided to drink water. First symptoms were blue-green vomits and a dysenteric syndrome. We described mucositis and epigastric tenderness. His pulse rate was 115 beats/min, blood pressure 135/80 mm Hg, respiratory rate 30 breaths/min, oxygen saturation 98% on room air and temperature 37,1°C. Cardio-pulmonary and neurological examination were unremarkable. Laboratory findings, blood gas analysis and classical toxicological analysis were unremarkable. After an endoscopy, gastric lavage was instituted to prevent absorption. The wife's patient revealed that the ingested liquid was a solution of copper sulphate used as blue-coloured painting for ceramic pottery. The estimated quantity was 10 grams and we started chelating therapy with dimercaprol. Serum copper level was 144 µg/dl (N=70–170 µg/dl) and remained normal during therapy. None complications were found and the therapy was stopped after 72 hours. The patient left ICU after 4 days.

Literature Key-points: Bluish vomiting after acute poisoning is exceptional in an ED. Because of their complications and high mortality rates, copper sulphate, boric acid and paraquat ingestion should first be considered. According to a PubMed review, those poisonings are infrequent in our western countries. Excessive intake of copper sulphate and boric acid can lead to life-threatening complications. Ingestion of a small quantity of paraquat can be quickly lethal.

Conclusions: These three toxics have the same, non specific first symptoms (dysenteric syndrome). Copper sulphate intoxication can lead to intravascular haemolysis, methaemoglobinemia, rhabdomyolysis and MOF. Skin manifestations are typical after boric acid poisoning. Neurological manifestations predominate with boric acid intoxication. Paraquat is caustic and leads to respiratory insufficiency and MOF. First treatment is symptomatic. Chelation therapy includes D-penicillamine, BAL and EDTA for cupric toxicosis. No antidote is available against boric acid and paraquat intoxication. Given the potentially severe outcomes and high mortality rates of these poisonings, emergency physicians should be aware with the management strategies of such patients.

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Abstract Nr: 30 Green urine: an X-File?

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Abstract not available

Abstract Nr: 31 Amlodipine intoxication: no just a clinical picture of hypotension...

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Introduction: Amlodipine poisoning is usually characterized by severe arterial hypotension. We describe the case of a severe respiratory failure associated with amlodipine poisoning.

Case report clinical presentation: An 18-year old healthy man was admitted after the ingestion of 700 mg of amlodipine. Low blood pressure (73/42 mmHg) prompts us to begin fluids, noradrenaline, intravenous calcium chloride and hyperinsulinemia- euglycemia therapy. On the second ICU day, the patient developed respiratory failure with new bilateral lung infiltrates. Mechanical ventilation was started with deep sedation, high positive end expiratory pressure (12 cmH₂O), neuromuscular blocker agents and inhaled NO (figure 1). Swan-Ganz monitoring (adjusted PAPO on the first morning at 12 mm Hg)¹ and repeated cardiac echography showing a euvolemic status with undilated vena cava, suggest a lesional origin of the pulmonary oedema as defined by the recent consensus conference of Berlin.² (figure 2). After 5 days he was successfully weaned from mechanical ventilation and discharged at day 10.

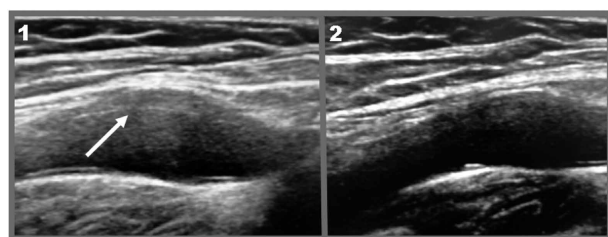
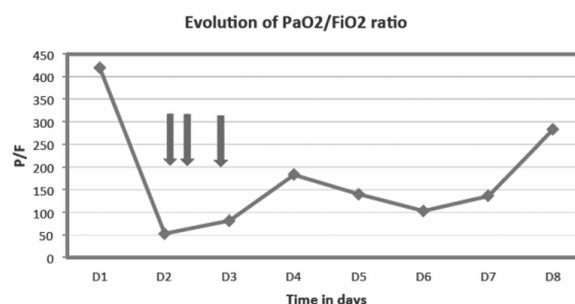


Figure 1 Evolution of Pao₂/Fio₂ ratio



*Red arrow ,from left to right :

- Sedation (midazolam and morphine)
- Inhaled nitric oxide (NO 10 ppm)
- Curarization (cisatracrium, continuous infusion)

Figure 2 Haemodynamic first values on the second day

Literature Key-points: The side effects of amlodipine overdose are shock, acute renal failure, seizures, heart block, metabolic acidosis, hyperglycemia and pulmonary edema. This last one seems to appear in the first 48 hours after overdose. Lost of inotropy and large fluid overload are excluded by our hemodynamic assessment. Calcium channel blockers are well known to induce systemic pre-capillary vasodilatation, resulting in an increase in the trans-membrane capillary pressure. This mechanism could contribute to excessive pulmonary capillary transudation observed in overdose. Another theory suggests mechanisms including a change in permeability secondary to a direct effect of calcium on endothelial cells by a prostaglandin effect, or also, a secondary effect of massive sympathetic discharge due to poisoning. Data about verapamil³ suggest that, high concentration of verapamil seems to increase IL-1 induced expression of endothelial leucocyte adhesion molecule, ELAM-1.

Conclusions: Amlodipine intoxication is infrequent and remains a challenge for emergency and ICU physician due to the multisystemic sides effects of poisoning. Non-hemodynamic severe respiratory failure could be observed lately in the evolution and after restoration of shock.

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Abstract Nr: 32 Skin lesion, you said diagnostic?

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Introduction: Emergency physicians are sometimes unprepared to skin lesions. However, some are easily identifiable and allow asking an etiologic diagnosis fairly quickly.

Case report clinical presentation: Fifty-three year's patient presenting to the emergency department a lesion to the right arm. The background is a lumbosciatica treated by anti-inflammatory. On physical examination, there is a well-defined erythematous lesion without inflammatory signs. No fever or lymphadenopathy.

The diagnosis of fixed drug eruption (FDE) (alias 'erythème pigmenté fixe') in response to anti-inflammatory is confirmed after dermatologist's consultation.

Topic cortisone alternating with an iodine disinfectant and stopping anti-inflammatory drugs are recommended.

Literature Key-points: The 'erythème pigmenté fixe' is a pure drug eruption, which is the only dermatosis whose origin is always drug.

If we take the same drug, the lesion becomes erythematous and pruritic. If we stop the medication, the lesion becomes brown and remains several years. The fixed pigmented erythema may be due to taking analgesic (paracetamol ...), anti-inflammatory drugs, antiparasitic, antibiotics, barbiturates, antihistamines, laxatives or contraceptive pills. The time to onset is usually a few hours (max 48 hours). This is the recurrent character in the same location and pigmentary changes which make the diagnosis.

Topography can help identify the offending drug (genital isolated involvement=cyclins, generalized=anticonvulsants).

Confirmation of the diagnosis is obtained by carrying out test patch. The only treatment is to stop taking the offending drug and outlaw taking a drug in the same chemical family. Healing is then final.

Conclusions: The 'erythème pigmenté fixe' or fixed drug eruption (FDE) is easy to recognize in emergency room.

The emergency physician may also identify the molecule responsible and avoid a recurrence.

Abstract Nr: 33 Coronary injury induced by mechanical cardiopulmonary resuscitation device.

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Introduction: External mechanical resuscitation systems were developed for continuous and effective chest compression with the goal to increase the spontaneous blood circulation renew. Two kinds of system are allowed: the LUCAS (Lund University Cardiac Arrest System) and the AUTOPULSE.

Case report clinical presentation: We report a case of a 62-year-old man with an important IVA coronary damage due to the use of a mechanical cardiopulmonary resuscitation device (autopulse/lucas). He was admitted after a cardiac arrest occurred in his garden few minutes after multiple bee stings (beekeeper). Twenty minutes CPR with the use of LUCAS mechanical device and vasoactive drugs restored a hemodynamic stabilized situation. During his management in the intensive care few hours after admission, ECG modifications were noted consisting in acute myocardial infarction in the anterior leads. The

coronarography showed an important injury of the left anterior descending artery consisting in wall contusion with secondary lumen subocclusion, imputable to the CPR.

	D2 (morning)
PVC	12 mmHg
PAP Syst.	40 mmHg
PAP Diast.	24 mmHg
PAP Avg.	30 mmHg
PAPo	16 mmHg
PAPo Adjusted	12*mmHg
Cardiac output	7.2 (indexed)
SVO2	85 %

Figure 1 acute myocardial infarction in the anterior leads. **Fig 2:** LAD (Left Artery Descending) occlusion, with evidence of paraluminal contrast due to contusion. **Fig3:** LAD recanalization only by contrast injection. **Fig4:** Final result after 2 stent implantation.

Literature Key-points: Recent studies have demonstrated a significant ability to achieve return of spontaneous circulation with these mechanical chest compression compare to manual resuscitation. Moreover, these devices have proved they constitute a reliable alternative to manual CPR for ambulance or helicopter transport, reduce human resources and increase the safety of emergency medical team during the CPR.

Nevertheless, these mechanical CPR devices are not harmless. Besides commonly traumatic changes described after manual CPR such rib fractures, fracture of the sternum or hematoma in the mediastina,¹ some autopsy after mechanical resuscitation have shown an high frequency of vertebral fracture and a few cases of visceral injury.² It was mainly the contusion of the heart and laceration of the lung but also carotid artery injury, ruptured liver or spleen.³

Conclusions: The mechanical resuscitation devices have proved their efficiency to return to spontaneous circulation. There are yet able to cause some thoracic or abdominal injuries. The knowledge of these potential complications is important for the optimal management of the patient at emergency or intensive care.

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Abstract Nr: 34 Sudden headache, visual disturbances and hypotension without subarachnoid hemorrhage

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Introduction: A sudden symptomatology of visual disturbances and intense headache evokes a meningeal haemorrhage. Here we report a similar table whose etiology is exceptional.

	No-ROSC	ROSC	P-value
Number	30	22	
Age*	73 (61-79)	72 (55-83)	0.874
Male	23 (76.67%)	11 (50%)	0.046
Initial rhythm			
Asystole	20 (66.67%)	12 (54.55%)	0.375
VFib	6 (20%)	8 (36.36%)	0.189
PEA	4 (13.33%)	2 (9.09%)	0.636
Time call-ALS* (min)	14 (12-17)	12 (8-15)	0.031
Time call-BLS*† (min)	0 (0-3.75) (2 missing)	0.5 (0-4) (4missing)	0.554
Time collaps-BLS*† (min)	3 (0-10)	2 (0-9)	0.984
Mean initial rSO₂* (%)	27 (14-33)	36 (13-54)	0.046
Witnessed arrest	15 (50%)	17 (77.27%)	0.046
Lay-rescuer BLS	20 (66.67%)	12 (54.55%)	0.375

Table 1

*Expressed as median (25th-75th percentile)

†BLS: BLS started by lay-rescuer, general practitioner or ambulance personnel

*Of 15 patients in the no-ROSC group time of collaps is unknown and of 5 patients in the ROSC group. VFib=ventricular fibrillation; PEA=pulseless electrical activity; ALS=advanced life support; BLS=basic life support; rSO₂=cerebral saturation; Call=emergency call; ROSC=return of spontaneous circulation

Case report clinical presentation: The emergency physician is called for a patient presenting a sudden diplopia with an intense headache. He has just been transferred after 3 hours of intensive care post carotid thromboendarterectomy. This was carried out four years after a cerebral stroke whose results had demonstrated incomplete thrombosis in the right internal carotid artery. Resonance had also demonstrated a pituitary adenoma. The patient had a history of alcohol consumption, smoking and hypertension. Clinical examination showed a blood pressure 94/44mmHg, agitation, ptosis, strabismus, and bilateral pupillary areflexia.

In the absence of hemorrhage on the CT-scan, a magnetic resonance shows a pituitary apoplexy with increasing of the pituitary volume erasing the optochiasmatic tank and corbeling the intracavernous right internal carotid. Biology shows a hormonal meltdown. A surgery is proposed but refused by the patient; a hormone replacement therapy is given. Four months later, the vision and blood pressure were normalized.

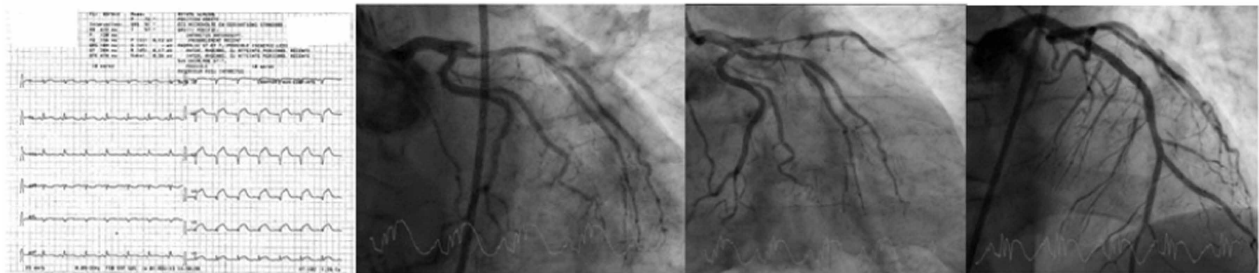


Figure 11

Literature Key-points: Pituitary apoplexy is a cerebral stroke, occurring almost always in the context of a macro-adenoma with hemorrhagic risk. A triad of acute headache, visual disturbances and hypopituitarism characterizes it.

It occurs spontaneously but associated factors were reported: drugs, head trauma, hypertensive crisis, gamma knife, diabetes, heart surgery... The diagnosis is based on history, clinical examination, visual field examination, magnetic resonance and hormonal biology. Treatment focuses on hormone replacement (cortisol and thyroid hormones). Surgery can be proposed and radiotherapy has also been reported.

Conclusion: We report a case of pituitary apoplexy after carotid surgery, never described in Pubmed.

Abstract Nr: 35 Something in the air

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Introduction: When they involve patients with comorbidities, several benign pathologies may reveal their darker side, eventually threatening their life.

Case report clinical presentation: A 82-year-old man was admitted in the emergency room complaining of abdominal pain with hematuria and mictalgia for 10 days. His past medical history included diabetes mellitus and bladder diverticula as the result of benign prostate hypertrophy. At the admission, the clinical exam revealed a tensed and diffusely painful abdomen.

Laboratory test indicated elevated inflammatory proteins and hyperglycemia. Urine analysis confirmed hematuria, together with leucocyturia and bacteriuria (E-Coli and Klebsiella). Abdominal CT scanner revealed an emphysematous cystitis with bladder diverticula (Figure). Despite antibiotics, glycemic control and hemodynamic support, the evolution was unfavorable within 48 hours, due to refractory septic shock.

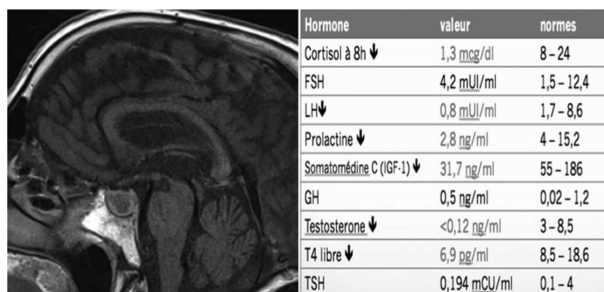


Figure 12

Literature Key-points: Emphysematous cystitis is a rare disorder that may occur in patients with concomitant diabetes and bladder urine stasis. Most often, infection involves facultative aerobic/anaerobic bacteria such as E-coli or Klebsiella. In anaerobic conditions, glucids are fermented, and gaz produced (CO₂) in and around the bladder wall. Clinical pattern may be silent and banal cystitis misdiagnosed abdominal CT, revealing gaz in the bladder wall makes the diagnostic obvious. Therapy is based on parenteral antibiotics, bladder drainage and euglycemic control.

Conclusions: Due to its unspecific initial presentation, emphysematous cystitis diagnosis is often delayed. Suspicion should be raised in patients with specific risk factors such as diabetes and urine stasis.

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Abstract Nr: 36 Death after ascites puncture by an emergency physician, what's happened?

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Introduction: Ascites puncture is a technique frequently performed, with very low associated morbidity. We describe an unusual cause of fatal hemoperitoneum.

Case report clinical presentation: Soon after midnight a Child C cirrhotic patient requiring iterative ascites punctures was admitted to the emergency department. Anamnesis revealed he had an ambulatory consultation two days before admission and puncture was planned next week. He called the ambulance because of malaise, dyspnea and increase of abdominal distension and legs edema, walking annoying to the point of causing a fall in the evening. Physical examination showed a conscious icteric apyretic patient. Vital signs were: BP 106/63 mm Hg, pulse 136/min, respiratory rate 12/min, oxygen saturation 100%. Abdomen was extremely distended by ascites, without pain at palpation. Both legs were identically swollen up to their roots; dermabrasion of a knee and an elbow were noted. Laboratory results showed perturbation

of hepatic tests similar as those measured two days before, hemoglobin 10.7 gr/L, platelet count 66000/mm³, INR 2.3. To alleviate abdominal distension and dyspnea ascites puncture in the left iliac fossa was performed. Liquid was obviously bloody all along two syringe of 50 mL and catheter was removed. During the next 15 minutes the patient presented abdominal pain and systolic BP 90 mm Hg. CT scan revealed a small hemorrhage (picture 1), initially related to the puncture site according to the radiologist. The patient was admitted to the ICU. Situation rapidly evolved to severe uncontrolled hypovolemic shock. Angiography was planned but the patient died before. Second lecture of the CT scan revealed that the cause of hemorrhage was in fact a rupture of the ombilical vein, associated to portal thrombosis.

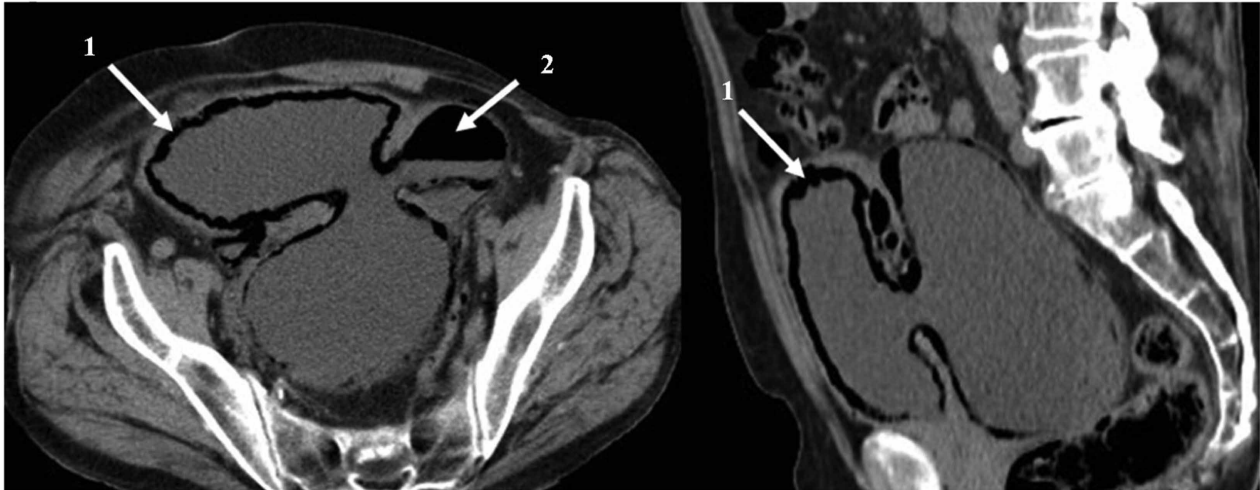


Figure 13

Literature Key-points: A Medline search revealed only 6 published cases of spontaneous ombilical vein rupture in cirrhotic patients. There are also numerous case reports of rupture of retroperitoneal varix. Portal hypertension is a major component. Laparotomy was performed in most cases. The role of arteriography is not investigated.

Conclusions: Emergency physicians should consider traumatic or even spontaneous rupture of the ombilical vein or retroperitoneal varix as etiology of hemoperitoneum in cirrhotic patients.

Abstract Nr: 37 Zincchloride intoxication in a pregnant women.

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Introduction: We present a case of zincchloride intoxication in a pregnant women. Reports of zinc chloride ingestion are uncommon and there is little information about the optimal management. There are even less data about the foetal effect.

Case report clinical presentation: A 24 weeks pregnant old woman, 32 years old, presents herself at the emergency departement with a burning sensation in the pharynx and the epigastrium, followed by nausea and vomiting. The symptoms started immediately after a sip of bottled water. Gastroscopy showed moderate pharyngeal and oesophageal corrosive lesions and severe gastric corrosive lesions without perforation of the stomach. Arterial blood gas showed a mild metabolic acidosis (pH 7.33, HCO₃⁻ 17.9) with a normal anion gap. However, zinc excretion was elevated (2737 µg/g creatinine) up to 1 month after the ingestion. Abdominal X-ray (with a protective lead apron around the belly) shows no extra-intestinal air

under the diaphragm. Foetal doptone monitoring was normal. Toxicological analysis of the bottled water showed a significant amount of zinc (ca. 190 g/l) and a significant amount of chloride (ca. 280 g/l); indicating the presence of zincchloride. Initial treatment consisted protonpompinhibitors, parenteral nutrition, followed by repeated gastroscopies and dilatation of a pylorusstricture after several weeks. At 38th weeks pregnancy, a healthy baby is delivered. One week after delivery, the patient underwent a total gastrectomie with roux-en-Y construction. Patient recovered uneventfully.

Literature Key-points: Most common symptoms mentioned in literature are corrosive lesions of the gastrointestinal tract, vomiting, lethargy, metabolic acidosis, exocrine pancreatic insufficiency and renal insufficiency. When systemic symptoms are present, chelator therapy can be considered.

Conclusions: We report a case of zincchloride ingestion in a pregnant women. The corrosive gastric lesions were initially treated conservative, but surgery was finally needed. There is few literature about foetal consequences. In this case, foetal monitoring was normal and the baby was healthy at birth.

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Abstract Nr: 38 Unintentional drug poisoning: Special case of Loperamide

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Introduction: A 60 years old lady, with a state of consciousness of 6/15 on the Glasgow Coma Scale (GLS: E1V1M4) is managed by the SMUR. The first tests were negative and drug intoxication is considered due to a medical history of drug intoxication and miosis. Therefore, 1/2 ampoule of Naloxone is administered, which rapidly improves consciousness of the patient. An heteroanamnesis reveals a massive and involuntary take of Loperamide.

Case report clinical presentation: A lady of 60 years is managed by the SMUR for altered consciousness. She is intubated immediately due to GLS 6/15. Blood pressure, pulse and blood sugar are normal. She shows no sign of falling, loss of urine or tongue biting. Her medical history includes: chronic obstructive pulmonary disease, depression, suicide attempt (SA) and chronic alcoholism. The heteroanamnesis points out that she did not feel well yesterday but did not report any toxic nor medication intake.

On arrival to the emergency room, the patient is hemodynamically stable. Biology, ECG and CT scan were unremarkable. Clinical examination revealed a miosis which coupled with the state of consciousness and history of SA, lead us to administer one half ampoule of Naloxone and this, before the results of blood (alcohol, benzodiazepines, barbiturates, tricyclics) and urine (cannabinoids, methadone, opiates, cocaine, amphetamines) toxicology.

The patient was extubated due to her rapid recovery after injection.

Naloxone is stopped because of the negative urine toxicology test and quickly resumed due to a further deterioration of consciousness. This leads us to another toxic reacting with Naloxone. Later, the family reports the intake of 1 to 2 tablets of loperamide, which greatly exceeds the maximum daily dose and can cause depression of the central nervous system.

Literature Key-points: Unlike natural opiates, Loperamide has no morphinan nucleus and is therefore not detected in the immunoassay.¹ But like morphine, it is antagonized by Naloxone, because of its agonistic action on the opioid μ -receptors in the intestinal wall.²

The case presented is not unusual: 842 unintentional Loperamide poisoning have been reported in the 2011 annual report of the American poison control center.³

Conclusions: Loperamide toxicity was underestimated by both the patient and his entourage in the anamnesis. To reduce this risk, patients, prescribers and pharmacists should be better informed of the risks of unintentional poisoning with Loperamide.

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Abstract Nr: 39 A 9/11 experience after cocaine use

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Introduction: Thrombotic thrombocytopenic purpura (TTP) is a rare disease due to a severe deficiency of a von Willebrand factor (VWF)-cleaving protease, ADAMTS 13. In literature there are just a few cases described associated with drug abuse, and in this case with cocaine use.

Case report clinical presentation: 9/11/2013; a 34-year old Caucasian male was admitted with weakness of his right leg with paraesthesia and frontal headache after smoking heroin earlier. He also had complaints of retrosternal pain and nausea since four days. Once there was some haematuria. He confessed to be a methadon user and since two weeks he also used intravenous cocaine.

Clinical examination showed an afebrile, haemodynamically stable patient with petechiae and normal heart and breath sounds. ECG showed a STEMI.

The blood results were consistent with microangiopathic haemolytic anaemia and thrombocytopenia. The blood smear showed 40–50 schistocytes/field (normal <1) and the diagnosis of TTP was made. Immediately daily plasma – exchange therapy was initiated. ADAMTS 13 enzyme activity was measured and less than 5%, which means a severe deficiency.

Literature Key-points: TTP is a rare disease due to a deficiency of a VWF-cleaving protease, ADAMTS 13, that cleaves the large VWF multimers. When deficient, abnormally large VWF multimers in plasma have a greater ability to react with platelets and cause the disseminated platelet thrombi, characteristic of TTP. The annual incidence of TTP is approximately 1 per 100 000 population. Without treatment the mortality rate is extremely high (90%) due to systemic microvascular thrombosis that causes cerebral and myocardial infarctions and renal failure. TTP can be associated with drugs such as ticlopidine and clopidogrel, but in literature also a few cases are described by cocaine use.

Conclusions: In this case the neurological symptoms were caused by cerebral microvascular thrombosis. Our patient also had a STEMI due to cardiac microvascular thrombosis and renal impairment. The presence of anaemia and thrombocytopenia suggested the diagnosis. Schistocytes and reticulocytes on peripheral blood smear, increased serum levels of lactate dehydrogenase and indirect-reacting bilirubin and a negative direct Coombs' test supported the diagnosis. In our patient we can assume that his IV cocaine use was the trigger for TTP.

In every patient without overt explanation for TTP, we have to ask for drug abuse and perform a toxicologic screening.

Abstract Nr: 40 Biopsy and interpretation: The pitfalls of a tentative diagnosis.

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Introduction: A 40-year old man, with a previous history of neuro- and lungsarcoidosis, presented at the ED with neurological deterioration: dysphasia and an increase of rightsided hemiparesis, despite adequate intake of MTX, medrol and valproate. Apart from green coloured sputa for a week, there were no respiratory complaints. CT scans of thorax and brain showed an increased number and larger size of preexisting injuries. Doubts were raised about the diagnosis of sarcoidosis and a transthoracic biopsy was ordered.

Case report clinical presentation: 1.5 years earlier, he presented to the pneumologist in hospital X because of a 2 month cough, dyspnea and weight loss. On CT thorax then, blurry nodular lesions were seen in both lungs, many with central hypodensity suggestive for necrosis, but without adenopathies. Based on BAL CD4/CD8 augmentation, sarcoidosis was diagnosed. Transbronchial biopsies, however, were not representative. Open lung biopsy was refused. ID was negative, as were all blood analyses. The pneumologist doubted the diagnosis as necrosis on CT was atypical for sarcoidosis granulomas.

A new BAL was performed a half year later in ZOL Genk and showed chronic interstitial lung damage. On transbronchial biopsy, interstitial inflammation and epithelioid granulomas (without necrosis), noduli and alveolar consolidations were seen. **Conclusion:** alveolar sarcoidosis without fibrosis.

Both clinically and radiologically the patient's condition fluctuated. In January 2013 he presented with generalized convulsions. Hyperintense reticulonodular contrast capturing injuries were seen in pons and mesencephalon seen on MRI, possibly indicating neurosarcoidosis.

Thoracoscopic biopsy during the last hospitalisation proved surprising: lymphomatoid granulomatosis.

Because of cerebral invasion with midline shift, the patient was urgently referred to hematology at UZ Leuven for chemotherapy. Despite this, the patient died a few weeks later.

Literature Key-points: Sarcoidosis and lymphomatoid granulomatosis are clinically similar disorders. Radiologically there are similarities and key differences, by definition not necessarily present. Histopathological differences are crucial. Diagnostics are strongly dependent on the quality of biopsy (open, transbronchial) and its interpretation.

Conclusions: Would the timely diagnosis of lymphomatoid granulomatosis have altered the prognosis?

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2/ Lymphomatoid Granulomatosis : insights Gained over 4 decades Anna-luise A. Katzenstein

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Abstract Nr: 41 Feedback on the use of the bispectral index (BIS) in a head trauma patient.

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Introduction: Clinical assessment of a head trauma patient and outcome relies especially on Glasgow coma score and follow-up. For severe trauma, intubation, sedation and curarisation will be necessary making neurological evaluation difficult. Resorting to BIS measurement may prove useful in this case.

Case report clinical presentation: Following a road accident, a 36-year-old man of 80 kg was managed by the ambulance services for an injury including haemorrhage of the corpus callosum and subdural and subarachnoid haematoma resulting in mass effect. Extracranial particulars included right flail chest and a perisplenic hemoperitoneum. A craniotomy and laparotomy were performed.

With an initial GCS of 3/15, intubation and assisted ventilation were administered with 20 mg of etomidate, 5 mg of midazolam and 100 mg of succinylcholine. He was given 8 mg of vecuronium and 20 µg of sufentanyl 20 minutes later.

45 minutes after intubation, the patient was stable (PNI 165/100, HR 100 bpm, temperature 34.6°C, SaO₂ 100%) and BIS was 60%. 75 minutes later, BIS was 75%.

These high values were indicative of preserved brain activity despite clinical particulars and imaging.

The patient was discharged from hospital after 5 months with a GCS of 3.

Literature Key-points: Dr Fabregas was able to show that the BIS can determine the probability of coma recovery in unconscious patients after a serious brain lesion. The BIS is the result of a calculation based on the spontaneous EEG of patients under general anaesthesia. On a scale of 0 (no brain activity) to 100 (normal level of consciousness), the BIS value offers an estimate of depth of anaesthesia for titrating anaesthetic agents to maintain a stable level for the purposes of surgical intervention. The high values in the patient indicate a persistent preserved brain activity (a major factor for determining continued management) and the need to increase sedation in this curarised patient.

Conclusions: The clinical case shows the dual interest of using the BIS in an emergency room. It enables the titration of sedatives in an intubated patient. And as with the Fabregas study, the BIS enables to estimate the neurological recovery of head trauma once sedation has been withdrawn. Other studies are nevertheless needed to validate the procedure.

Fabregas & al; *Anesthesiology* 2004,101:43–51