Selected Abstracts from the Society for Acute Medicine and Royal College of Physicians of Edinburgh Autumn International Meeting 2016

The Autumn meeting of the Society for Acute Medicine in 2016 was co-hosted with the Royal College of Physicians of Edinburgh and was held in the prestigious surroundings of the Edinburgh International Conference Centre. As usual a large number of abstracts were received and over 150 of these were selected for display as posters following peer review. Those ranked most highly were also presented orally, and the abstracts of these are published here. We have also published the abstracts of the posters which were awarded 'highly commended' rosettes during the meeting.

A multi-professional Sepsis Team improves the recognition and management of sepsis

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Aim

Sepsis is a leading cause of mortality in the UK but is poorly recognised and treated.[1] Early diagnosis and management of sepsis has been shown to improve survival and was identified as a key priority by NHS England in 2014. The 2015 NCEPOD report on sepsis recommends a formal protocol for the recognition and management including a care bundle that is regularly audited.[2]

Our aim was to improve compliance with local sepsis guidelines through a range of interventions.

Methods

A multi-professional Sepsis Team was created including a dedicated Sepsis Lead Nurse, administration/IT support and Junior Doctors in a range of specialties.

The local Sepsis Pathway and paper proforma were updated. 'Drop-boxes' were provided for the efficient collection of completed sepsis proformas. Positive blood culture results and coding data were also analysed for cases of sepsis and a novel database was created to allow continuous data entry and auditing. 'Sepsis Grab-Bags' were introduced to ensure availability of equipment for the immediate management of sepsis in all clinical areas.

Education of multidisciplinary teams was conducted via both didactic teaching and 'in-situ simulation'. A focus was placed on pre-hospital recognition of sepsis with the development of a Community Sepsis Pathway and education of community teams.

Outcomes / Results

Compliance local with guidelines was recorded in cases meeting diagnostic criteria for sepsis.[3]

Over consecutive quarters there was an improvement in the percentage of patients with sepsis receiving antibiotics within 1 hour of diagnosis, from 33.3% in Q1 2015/16 to 83.3% in Q1 2016/17 (figure 1).

The proportion of septic patient arriving in A&E with a sepsis pre-alert has steadily increased (figure 2).

Conclusion

The introduction of a multi-professional Sepsis Team improved compliance with evidence-based guidelines thus increasing early intervention in a time-sensitive condition. Clinical staff reported increased levels of confidence in the recognition and management of sepsis.

References

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Improving the Quality of Care for Patients with Linked Mental Health and Physical Illness at Acute Mental-Physical Interface through Interprofessional Education

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Aim

Up to 25% of patients admitted to hospital with physical illness have co-morbid mental health conditions and have poorer outcomes. [1,2,3]

Following occurrence of a number of serious adverse incidents in our emergency and acute mental health settings, a patient safety committee was established and Acute Medicine and front-line Mental Health services were engaged to jointly respond to patients afflicted by mental illness presenting with acute medical emergencies.

We pioneered a collaborative learning programme for our frontline multi-disciplinary mental health and acute medical staff addressing the highly topical acute mental-physical interface. [4]

Methods

South London and the Maudsley (SLAM) psychiatry and Kings College Hospital acute medical and emergency teams provided expertise in designing a multifaceted course to address the significant challenges affecting patients who present at the acute mental-physical interface.

6 commissioned sessions were delivered. These encompassed case-based discussions, interactive group work, simulation-based learning featuring actors and specialist sessions on de-escalation techniques, *all elements based on adverse events*.

46 delegates included registered mental health nurses, psychiatry doctors, acute medical doctors and nurses, health care assistants, dementia nurses and medical students participated and fed back through pre and post course surveys and focus groups.

The 'Challenging Patient Safety Committee' has been reviewing the reported incidents for patients with mental health illness admitted with a medical emergency. This has helped in a small way scope the value of this education intervention.

Outcomes / Results

Satisfaction

Candidates reported a high level of satisfaction, valuing shared expertise, knowledge and understanding of one another's roles.

See appendix: Figure 1.

Learning

Candidates Reported learning in 5 key areas.

See appendix: Figure 2.

Behaviour

Participants reported improved personal confidence at managing complexities at the mental-physical interface and 'motivation to do more integrated working'.

See appendix: Figure 3.

Impact in Work Place

Participants gave specific examples in post course focus groups of changed behaviours leading to improved outcome to patients by co-working with mental and physical health colleagues *earlier* and *supporting* less confident colleagues with new gained skills.

Incident Reporting

The nature of reported adverse events have been less serious in nature for patients with co-morbid mental health and physical illness in the acute medical department, this is hopefully in part due to this education intervention.

Conclusion

Collaborative engagement has introduced completely new concepts for different staff groups and shown reported changes in staff behaviours leading to improved outcomes for patients with linked mental health and physical illness soon after learning in this way. This has highlighted the value of this unique programme at the acute mental-physical interface.

References

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4. Five year forward view for mental health; A report from the Independent Mental Health Taskforce to the NHS in England, February 2016

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Let's put pressure on prevention'

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Aim

We work in a district general acute medical unit with a high level of acutely frail patients being admitted. We noticed that within our acute medical unit there was an increase in facility-acquired pressure ulcers, and poor adherence to our key performance indicators for pressure ulcer prevention and management. The issue related to a lack of available risk assessment documentation / tools for patients within the emergency department resulting in a significant number of incidents being identified in the Acute medical unit. In collaboration with Institute of Health Improvement a project to reduce incidents was developed. Our aim was to increase the use of risk assessment tools in the emergency department and improve the implementation and documentation of preventative measures taken.

Methods

A baseline review of practice was carried out. A collaborative working group reviewed the current tool used for pressure ulcer risk assessment throughout the hospital and modified it to develop a focused ED specific skin bundle. This was validated alongside the tissue valiability team within the trust and had buy in from the emergency department's nursing staff. The staff were educated on the use of the tool. The tool was implemented and practice audited monthly with run charts to see if there was an improvement in the compliance with risk assessment and management of pressure ulcers.

Outcomes / Results

Baseline data showed that 73% of patients being admitted were deemed at risk of pressure ulcers and only 12% of patients had any documented evidence of a risk assessment and preventative measures taken. After implementation of the quality improvement project and monthly re-audit of the performance there has been an increase in compliance to 70-100%

Conclusion

This project has been linked with a 50% reduction in the number of facility-acquired pressure ulcers within the acute medical unit over a period of 6 months helping reduce length of stay and 'patient suffering' due to unnecessary skin damage. This has been equated to approximately £12,000 saving for the trust in terms of reduction in costs of care for these patients. To date the ward unit has now been 143 days 'facility-acquired pressure ulcer free'. The project's success has benefited our sister acute hospitals and the tool will be rolled out across all the emergency departments within the trust.

Is Vlogging the future? A novel approach to increased guideline awareness in non-specialists.

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Aim

Many clinical guidelines are written but often not read or implemented. Busy clinicians cite perceive lack of time and multitude of clinical guidelines as a reason. A brief online update is a potential mechanism to overcome these issues. We created a brief youtube clip on recently released national guidelines for heart failure and planned to assess the impact (immediate subject knowledge) and acceptability of this format.

Methods

A brief youtube clip with a simple face to camera style with selected subtitles was developed. The content was derived from the SIGN guideline for chronic heart failure in several iterative stages. Filming was undertaken in a single 2 hour session to create a 3 min clip and key points were subtitled. A convenience sample of clinical staff who treat patient with heart failure completed a brief questionnaire covering demographics, acceptability using likert scales, and 7 questions assessing knowledge relevant to the guideline that were repeated before and after video to assess immediate subject knowledge.

Outcomes / Results

49 staff (8 GPs, 10 consultants/associated specialists, 25 training grade doctors, 4 nurses, 1 medical student) were studied. 85.7% used youtube 'monthly' or 'never' for medical education.

75.5% 'strongly agree' or 'agree' felt that the intervention improved their knowledge. There was an average improvement in immediate subject knowledge of 39.7%.

79.5% 'strongly agree' or 'agree' that the content is relevant to their day-to-day practice. 61.2% 'strongly agree' or 'agree' that this was a useful format and 77.4% 'strongly agree' or 'agree' that they would watch further updates in youtube format.

Conclusion

Brief youtube intervention as a method of providing accessible guidelines to non-specialists appears

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promising. It demonstrated improvement in immediate subject knowledge and was generally well received as a video format. We plan to develop this further by creating brief youtube educational updates to cover other guidelines.

Our HDU course at Northwick Park Hospital - training for GIM registrars is valued and improves their confidence and performance with level 2 care

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Aim

Northwick Park Hospital's HDU is unusual in being managed by Acute Medicine Physicians and registrars rather than intensivists. Out of hours, the ward registrar on call covers. In 2011, a study suggested HDU mortality out of hours was higher than in hours, and there was anecdotal evidence of lack of confidence and skillset of some GIM registrars running the unit. An HDU course was set up to address this, and has run annually since 2012.

Methods

The HDU course is delivered in September and November each year. All new medical registrars are invited before they begin. There is no cost, but study leave must be arranged. The full day course consists of Lectures, Clinical skills and Simulation (SIM) scenarios[1]. Lectures include shock, NIV, chest drainage and more. Procedures are practised with ultrasound on SIM central line and chest models and pig thoraces.

The Simulation scenarios are run using our high fidelity Sim lab. 6 scenarios have been written for the course, which cover difficult topics including NIV troubleshooting, toxicology, sepsis, ceilings of care etc. Some scenarios are taken from previous serious incidents, allowing dissemination of key learning. The scenarios permit learning of knowledge, skills and situational awareness, the latter not routinely available in GIM registrar training, but important for managing critical events successfully[1]

Outcomes / Results

Feedback has been gathered after the course each year in a standardised questionnaire. 98% of feedback has been Very good or good and no negative feedback.

Awareness has spread by word of mouth among GIM registrars in the region. We have been awarded £3000 of funding to extend to regional acute registrars.

Out of hours HDU mortality has dropped since 2011, but it is not possible to attribute this to the course in a complex system with considerable changes over the interval.

Conclusion

A novel HDU course for GIM registrars is effective in improving their confidence, knowledge and skills for covering HDU during their on-call duties. SIM scenarios can be a useful tool for shared learning after serious incidents. We have been awarded £3000 of funding to extend to regional acute registrars.

References

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Concurrent and predictive validity for Frailty syndromes in the acute medical care setting

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Aim

For some, population ageing is associated with increasing frailty. Existing frailty assessment scores exhibit poor predictive power for adverse events in the acute medical setting. We have published work validating a model based on frailty syndromes (cognitive impairment, falls, reduced mobility, pressure sores, functional dependence and anxiety/depression) on English administrative data(doi:10.1136/bmjopen-2015-008457). We aim to explore concurrent (comparison with frailty index) and predictive validity (30-Day mortality, emergency readmission and institutionalization) for this model in the acute medical setting

Methods

A prospective observational study in the Acute Assessment Unit of Chelsea and Westminster Hospital with convenience sampling from May - Dec 2013 of adult acute medical patient admissions. Data was abstracted by a researcher from patient records up to 36 hours from admission. Outcomes were retrieved at one month after index admission. Statistical analysis includes descriptive statistics, logistic regression and Area Under the Receiver Operator Characteristics Curves(AUC) for predictive power derived from predicted probabilities. Missing data analysis followed by multiple imputation (by

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regression of dataset) where appropriate. Frailty Syndromes models were adjusted for age, gender and number of readmissions in previous 6 months. A Frailty Index was created from 31 criteria(Figure 1) from previously described methodology(DOI: 10.1186/1471-2318-8-24).

Outcomes / Results

Frailty syndromes were prevalent in those >65 years (N=482; cognitive impairment-27.8%, falls-42.1%, reduced mobility-5.2%, pressure sores-10.4% functional dependence-42.5% and anxiety/depression-31.3%). The frailty syndromes model had excellent concurrent validity with Frailty Index (AUC 0.83-0.85). The frailty syndromes model had moderate to good predictive power for adverse events at 30 days (inpatient mortality AUC 0.80-0.81, emergency readmission AUC 0.71-0.72, institutionalization AUC 0.63-0.65) in comparison to Frailty Index (inpatient mortality AUC 0.73-0.74, emergency readmission AUC 0.53-0.55, institutionalization AUC 0.52-0.58), compares favourably to Charlson Co-morbidity index and admission NEWS score(Figure 2)

Conclusion

Frailty syndromes are a valid and useful for risk stratification in older persons requiring acute medical care

Physician Consensus on preventability and predictability of readmissions: An international study based on standardized case scenarios.

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Aim

Hospital readmissions are increasingly used as a quality indicator with a belief that they are a marker of poor care has led to financial penalties in the United Kingdom and United States. Readmission risk is difficult to define and is less predictable than mortality.[1] A failure to discriminate between preventable and non-preventable readmissions may lead to a distorted evaluation of hospital care. A consensus definition of a preventable readmission has not been reached.[2]

We performed a pan-European survey to assess the degree of consensus between physicians regarding the predictability and preventability of readmissions.

Methods

An online survey based on eight medical case scenarios was distributed to physicians in Europe. For four cases, participants were requested to assess whether they expected the patients to be readmitted within 30 days (the predictability). Four cases describing a readmission, were presented and physicians were asked to assess the probability of their preventability.

For both parts of the survey a 5 part Likert scale was used as an answering model. The consensus was determined using descriptive statistics and the Intra Class Correlation Coefficient (ICC).

Outcomes / Results

526 physicians completed the survey. ICC for predictability of readmission was 0.67 (moderate to good) and ICC for preventability of readmission was 0.13 (poor). (see figures 1 and 2)

Conclusion

Patients are high risk of readmission are increasingly identifiable and reasonable consensus among physicians as to this cohort exists. The ability to modify and adapt these risk factors and a belief they reflect poor care is increasingly controversial and little consensus currently exists among physicians as to whether this is possible. Increasingly it appears readmissions may be predictable but possibly not preventable.

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Selected Abstracts from the Society for Acute Medicine and Royal College of Physicians of Edinburgh Autumn International Meeting 2016

The 8am Trolley Traffic Jam

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Aim

Our Acute Assessment Unit (AAU) has 10 trolley assessment spaces. We seek to establish the relationship between 8am AAU trolley occupancy and 4hr performance that day.

Methods

Our Acute Assessment Unit (AAU) has 10 trolley assessment spaces. We seek to establish the relationship between 8am AAU trolley occupancy and 4hr performance that day.

Outcomes / Results

On days when AAU trollies were empty at 8am, we achieved 95% 4hr performance 83% of the time. Occupied trollies at 8am reduced that 4hr performance to 58% of the time (P<0.001; chi square test). We found no relationship between 4hr performance and ED attendance numbers.

Wednesdays have the greatest variation in performance (Graph 1). Preliminary time series analysis shows that Day 1 is autocorrelated to day 2 (thus heavily predictive), and this declines at further days.

A general decline in 4hr performance as 8am trolley occupancy increases (graph 2). The relationship between trolley occupancy and 4hr performance has a Pearson's Correlation of -0.41 (P<0.01).

Data showed a positive correlation of 0.217 between Type 1 ED conversion rate and 8am trolley occupancy (P<0.01).

Conclusion

Having AAU trollies empty at 8am is a good predictor of the day's 4hr performance, and emphasises the need not to have patients in this area overnight. When trollies are occupied at 8am, it also appears to affect performance for the following next day. Our data strengthens the argument that the 4hr performance is not dependent on ED processes alone, and can be an indicator of poor flow elsewhere in the acute care pathway.

A national review of acute asthma exacerbations admitted to critical care

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Aim

Following the landmark confidential enquiry into asthma related-deaths in 2014[1], it was widely reported that asthma causes three deaths a day in the UK[2]. Of the 181 deaths examined in detail during the enquiry, 54(30%) occurred in hospital, with a further 43(23%) dying in hospital after suffering a cardiac-arrest prior to arrival. The enquiry provided limited additional information about the 27(15%) who were admitted to critical-care. This review aims to examine the outcomes and characteristics of asthma related admissions across all ICUs in Scotland in 2013/2014.

Methods

The data used in this review was prospectively entered into 'Ward-Watcher' across all general adult ICUs and combined ICU/HDUs in Scotland. The Scottish-Intensive-Care-Society-Audit-Group(SICSAG) provided anonymised data for patients admitted with an 'APACHE-III-reason-for-admission' or 'primary-diagnosis' of Asthma. Readmissions were removed from the final data extract; however, an overall count was kept.

Outcomes / Results

In 2013/2014 there were 29,588 ICU admissions and 256(<1%) due to Asthma exacerbations. 174(68%) were female, the average age was 40 and average length of stay was three days. 11(4.5%) patients were admitted to ICU with a primary diagnosis of asthma died, either in ICU, or before hospital discharge. Of these, eight were aged >50 years and nine had significant comorbidities. One patient had previously been in ICU (13 admissions). Six patients were GCS 3 (at<24hrs) and three of whom were admitted post-CPR.

Conclusion

Admissions to ICU with exacerbations of asthma were infrequent and usually resulted in a short length of stay and low mortality. The patients who died were generally older than 50, had significant comorbidities and had not previously been admitted to ICU. A minority (6%) of the overall national reported number of asthma deaths in 2013/14, occurred in ICU.[3] Future research should explore the potential survival benefits of earlier critical care input.

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Cause Identification of Missed Doses in the Acute Medicine Unit (AMU)

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Aim

North Bristol NHS Trust is dedicated to reduce the incidence of missed doses to improve quality of care and increase patient safety. AMU has been identified over recent months as a high percentage area for missed doses.

The aims of the audit are to establish reasons why missed does were occurring on AMU, their significance on patient safety and implement interventions to reduce this.

Methods

Over a 3 week period, pharmacists located on the AMU recorded using a data collection form any missed dose encountered and why, denoted by a '6' on the drug charts. The audit was undertaken during weekdays only in order to appropriately review service provision. Subsequently, interventions were implemented which involved a stock list review and notification laminates for patient doors. Effectiveness of interventions were re-audited 5 months later.

Outcomes / Results

Pre versus post intervention, there was a reduction in both the number of 6's and the number of missed doses occurring (Figure 1). Our intervention has subsequently reduced the likelihood of a '6' becoming a missed dose from 64.3% to 36.4%, equating to an absolute risk reduction of 27.9%.

Of the missed doses that did occur, these have been assigned a Red/Amber/Green (R/A/G) status as per the UKMI rating (Figure 2). Reassuringly, all categories have been reduced, but reductions of particular importance are the red and amber ratings as these can more impact on patient safety.

The number of non-stock items that resulted in a missed dose due to a delay in the pharmacy process has reduced from 29.7% to 21.7%.

Over a 3 week period, our AMU treats on average 1050 patients. The likelihood of a patient experiencing a missed dose has reduced from 5.7% to 2.6%.

Conclusion

Increasing awareness and identification of drugs unavailable to nursing staff has resulted in a reduction in missed doses on AMU.

References

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Efficacy of the acute medical ward in reducing length of stay for pneumonia: A Singapore Tertiary Hospital Experience

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Aim

The pilot Acute Medical Ward (AMW) was launched in Singapore General hospital (SGH) which is a large tertiary hospital in Singapore adopting some of the concept of acute care in UK admitting sepsis related conditions from accident and emergency. The aim is to offer timely access to medical assessment, diagnostics, treatment and early follow up for acute medical admissions. Sepsis related conditions, contributes to 40% of admissions to Department of Internal Medicine (DIM) of which pneumonia is one of the leading cause of death for hospital. We assessed our performance for the diagnosis of pneumonia via average length of stay(ALOS) reduction, readmission rates at 7,14 and 30days and mortality between intervention group and control.

Methods

We performed a retrospective analysis of all admissions to DIM for the year 2014 comparing with 2015 in AMW. Based on ICD- 10 coding of diagnosis groups, cases with discharge diagnosis of pneumonia as keyword search were identified. Pneumonia was further grouped into viral and non-viral pneumonia. One way Anova test was applied for statistical analysis of average length of stay(ALOS) reduction. Both groups were also compared for readmission rates at 7,14 and 30days and mortality between pneumonia groups.

Outcomes / Results

A total of 696 cases of pneumonia in 2014 versus 835 cases in AMW were compared. Pneumonia in AMW

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had ALOS reduction of 2.1days. Subgroup analysis for non- viral pneumonia before AMW (N=669, ALOS = 8.3days) and AMW (N=781, ALOS = 6.2days) showed a significant reduction in ALOS (P < 0.001 CI -1.3 to 3.3) between both periods. Viral pneumonia had 30 versus 54 cases and showed no significant reduction. Readmission and mortality rates showed no increase between the periods.

Conclusion

Acute care provision that offers Coordinated Care Pathways, Multidisciplinary Team input and additional physiological parameter monitoring clearly improves the ALOS reduction for pneumonia. Such service organization should apply for all acute medical admissions.

Use of a single hs-troponin I to faciliate early discharge

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Aim

To validate the use of a single hsTnI measurement as a tool to safely discharge low risk patients using two different thresholds, less than 2 ng/L and less than 5 ng/L, as recommended by the 2015 ESC guidelines[1] and Shah et al[2], respectively.

Methods

A retrospective list of all hsTnI tests requested from A&E and all wards at the Royal Gwent Hospital, Newport, over a four week period (17/08/15 and 13/09/2015) with corresponding results and patient demographics was obtained from the Laboratory Information Management System. The data were collated in a spreadsheet and analysed using Excel.

The clinical notes of all patients presenting with hsTnI concentration less than 5 ng/L at 0 hours were reviewed.

Outcomes / Results

The records of 825 patients were examined. ESC guidance recommends discharge of low-risk patients with an admission troponin of <2ng/L. 148/825 patients (103 females, 45 men, age ranges 16-84 and 16-59 respectively) had an admission troponin of < 2 ng/L with low-risk GRACE scores (16 - 111). 77/148 had a second sample collected and 63/77 patients were subsequently discharged. 11/63 were readmitted within 30 days however none had a major adverse cardiac event (MACE). Use of <5ng/L as a discharge tool has also been reported; in our cohort 359/825 patients (210 females, 149 men, age ranges 16-92 and 14-86 respectively, GRACE scores 16-151) had result of < 5 ng/L. 204/359 had a second sample collected and 152/204 patients were subsequently discharged. Of these, 39/152 were readmitted within 30 days however the MACE rate remained at zero.

Conclusion

Our data support the use of a single hsTnI measurement (< 2 ng/L) as a tool to safely facilitate discharge in low-risk patients, as currently recommended by the European Society of Cardiology guidelines.[1] Further, use of a single hsTnI measurement at <5 ng/L as a discharge tool has been reported[2], which we have also demonstrated here. In our health board, adoption of the threshold for hsTnI at <2 ng/L or <5 ng/L, has the potential to facilitate early discharge of 819 and 1976 patients respectively per annum, thus improving patient management and ensuring appropriate use of resources.

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An unexpected finding of Hamman's sign in a young adult following cocaine inhalation

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Case Report

Introduction

In 1939 Hamman reported spontaneous pneumomediastinum; free air in the mediastinum. It is a rare condition, sometimes idiopathic in nature but can be precipitated by barotrauma, excessive vomiting or straining, iatrogenic instrumentation or bronchial hyper- reactivity due to asthma or substance inhalation. This case demonstrates a very unusual presentation following significant nasal insufflation of cocaine.

Case presentation

A previously healthy 24 year old male presented to the emergency department with chest pain and neck swelling 24 hours after inhaling cocaine. On examination he was clinically stable with no signs

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of respiratory distress. A crunching sound could be heard with each heartbeat and surgical emphysema was palpated around the neck. Blood tests and ECG ruled out acute coronary syndrome however a CXR showed evidence of pneumomediastinum (figure 1). A CT thorax showed widespread pneumomediastinum, bilateral interstitial emphysema along the major bronchi and surgical emphysema in the anterior neck and supraclavicular area (figure 2). A contrast-enhanced oesophageal CT scan showed no evidence of oesophageal perforation. The Cardiothoracic surgical team advised a period of observation on the medical high dependency unit and review by the anaesthetic and critical care team due to concerns over the potential for airway compromise. The patient remained stable throughout a brief admission.

Conclusion

This case not only provides an interesting learning point but also highlights the following:

The importance of taking an illicit drug history from young adults presenting with chest pain

Increased vigilance when reviewing chest radiographs in this cohort of patients for signs of pneumomedisatinum

The importance of further imaging to rule out oesophageal perforation which confers a higher morbidity and mortality

Although rare and often a benign and self-limiting course, the potential for deterioration is present. Discussion with Cardiothroacic surgeons would be advisable as is close monitoring for potential issues with airway compromise and respiratory failure.

Age adjusted D-dimer excludes pulmonary embolism and reduces unnecessary radiation exposure in older adults: retrospective cohort study

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Aim

Background

Patients with elevated D-dimers and moderate to high clinical suspicion for PE generally proceed to CT pulmonary angiogram (CTPA) for diagnosis. Because D-dimer rises with age (1), an age-adjusted D-dimer threshold may prevent unnecessary radiation exposure from CTPA in older patients.

Objective

To determine the effect on diagnostic accuracy of implementing an age-adjusted D-dimer threshold to exclude PE.

Methods

Design, settings and patients

Retrospective comparison of conventional and age-adjusted D-dimer thresholds in 1000 consecutive patients who had both D-dimer and CTPA.

Main outcome measures

Sensitivity and negative predictive values (NPV) of D-dimer for PE. Conventional and age adjusted D-dimer thresholds for excluding PE were less than 250ng/ml and 5x age (for patients older than 50 years) respectively (2).

Outcomes / Results

Results

We diagnosed PE by CTPA in 242 (24.2%) patients. Sensitivity of D-dimer for PE was high. There were 3 false negatives with sensitivity 98.7% (95% CI 96.1 to 99.7%) and NPV 96.5% (89.4 to 99.0%) for the conventional threshold, and a total of 6 false negatives with sensitivity 97.5% (94.4 to 99.0%) and NPV 96.9% (93.1 to 98.7%) for the age-adjusted threshold. 3 patients (3.5%) out of 86 who had a D-dimer below the conventional threshold (250ng/ml) had PE, with Geneva scores 3, 9 and 14. Additionally, 3 patients (2.8%) out of 108 patients whose D-dimer lay between the conventional and age-adjusted threshold had PE, with Geneva scores 6, 8 and 9 (see Table 1). All six falsely negative patients were judged to have light clot load. 57/108 Group 2 patients had low clinical risk (modified Geneva score <5) and CTPAs that were negative for PE (see Graph 1).

Conclusion

In a consecutive series of 1000 patients an age-adjusted D-dimer threshold and a clinical risk score would have led to 57 fewer CTPA at a cost of no missed PEs.

References

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