



Emergency Medicine Research Morning

November 8th 2016

Program and Abstracts



DALHOUSIE
UNIVERSITY

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Dear Colleagues,

Welcome to the Emergency Medicine Research Morning!

Research plays an important role in advancing everyday clinical practice. Questions such as what drug to order; do guideline improve outcomes; and how can we evaluate system processes that impact patient care. Over the past year, our Emergency Medicine Research Program has undertaken projects that attempt to answer such questions that impact our department. Today, you will hear about some of these projects and publications.

Today's session provides medical learners the opportunity to present and receive feedback in a friendly format. We will present a prize to acknowledge the best research presentation. The other goal is to encourage formation of a collaborative research network in emergency departments throughout the province of New Brunswick.

Please take time to meet with others and discuss your research ideas. We hope you enjoy the morning!

Best regards,



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Research Rounds
November 8th, 2016
5DN Amphitheatre

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|---|-------------|--|
| Paul Atkinson | 08:15-08:30 | Coffee and Welcome |
| Paul Atkinson | 8:30-8:45 | The research year so far (a summary of the year) |
| Ansar Hassan | 08:45-09:30 | The rise (and potential fall) of cardiovascular research at the New Brunswick Heart Centre” Keynote Lecture |
| Kavish Chandra | 09:30-09:45 | Choosing Wisely |
| Kalen Leech Porter Fiona Milne | 9:45-10:00 | Exercise Prescriptions |
| Janeske Vonkeman | 10:00-10:15 | Domestic Violence |
| | 10:15-10:30 | Coffee |
| Munaha Mostafa | 10:30-10:45 | Critical Dynamics Intervention |
| Luke Taylor | 10:45-11:00 | Presentation of Research Project PICO |
| Mandy Peach | 11:00-11:15 | Presentation of Research Project PICO |
| Robert Dunfield | 11:15-11:30 | Anaphylaxis Education |

To choose or not to choose: evaluating the influence of an educational intervention reviewing the Choosing Wisely recommendations on the frequency of diagnostic imaging in the ED

Kavish Chandra, Jacqueline Fraser, Hanif Chatur, Paul Atkinson and Cherie Lee Adams

Introduction

Current available literature demonstrates that while the Choosing Wisely campaign is an innovative approach in addressing physician and patient attitudes towards low value medical interventions, a knowledge translation gap exists. We postulate that the use of practice and educational interventions may be helpful in closing this gap. The goals of our study are two-fold. Firstly, we will aim to quantify the proportion of ED physicians familiar with the CWC EM recommendations in an urban and rural ED. Following, we plan to assess whether an educational session reviewing these recommendations influences the frequency with which low back imaging is performed for low-back pain.

Methods

In phase 1 of the study, physicians working in an urban (Saint John Regional Hospital, SJRH) and rural (Upper River Valley Hospital, UVRH) emergency department were asked to participate in a survey assessing awareness and knowledge of the CWC EM recommendations before an educational intervention. The intervention consisted of a 1-hour seminar reviewing the recommendations, access to a video cast and departmental posters. In phase 2 of the study, physicians were surveyed again 6 months after the intervention. The effectiveness of the intervention was assessed by analyzing the frequency of plain film imaging studies conducted for low back pain before and after the introduction of our intervention. The eligible study population will be patients presenting to the ED for back pain or head injuries. The frequency of imaging tests from June 2014 to September 2014 for the pre-intervention period and June 2016 to September 2016 for the post-intervention period were collected and analyzed.

Results

The SJRH survey response rate was 64 and 53.8% in the pre- and post-intervention period respectively. Awareness of the EM recommendations increased from 81.3 to 92.9% and the percentage of physicians correctly identifying 80% or more of the recommendations increased from 62.5 to 85.7%. The UVRH survey response rate was 72.7% in the pre- and post-intervention period. Awareness of the EM recommendations increased from 25 to 75% and the percentage of physicians correctly identifying 80% or more of the recommendations increased from 50 to 87.5%. The plain film imaging rate at SJRH increased from 12 to 16.2% after our intervention ($p=0.023\%$).

Discussion

We demonstrated the current awareness and knowledge of the CWC EM recommendations and that it increased at 6 months. The effectiveness of our local knowledge translation initiative at SJRH increased the frequency of plain film imaging for back pain in the 4-month study period after. Future efforts will include extending the study period as well as investigating if a similar trend was seen at UVRH.

Combatting sedentary lifestyles in the ED; can exercise prescriptions in the Emergency Department lead to increased exercise?

Fiona Milne, Dr. Kalen Leech-Porter, Dr. David Lewis, Dr. Stephen Hull, Ms. Jacqueline Fraser, Dr. Paul Atkinson

Introduction

Exercise as a cornerstone of a healthy lifestyle is not a new concept; frequent physical activity is known to reduce mortality and comorbidities associated with chronic illness, and can have positive effects on mental well-being. Why then is it not routinely prescribed as any other medicine in daily practices? Its implications on systemic health outcomes cannot be ignored. It has been shown to be therapeutically effective in several diseases of varying nature. Its effectiveness has been studied among many medical specialties, from psychiatry to oncology; however, its efficacy in emergency medicine has not been strongly investigated.

Rationale

Prescribing exercise has shown to be effective in several medical environments, but its role in Emergency Medicine is not well-studied. In our study, the written prescription intervention will be compared to the normal exercise counselling practices that happen in the Emergency Department, for which there is currently no standard.

Methods

Our protocol will be a prospective study utilizing blocked randomization. Participants will be randomized to either control or intervention depending on what week they present to the ED. Participants will complete a post-discharge survey asking about their baseline exercise habits, and will then receive a follow-up call at 2 months post-discharge asking them to describe their current exercise regime. The intervention cohort will rate the exercise prescription's impact on their decision to exercise.

Impact

Our hope for this study is to assess what role, if any, that exercise prescription has in the Emergency Department setting. This study will hopefully impact the standard of care for exercise counselling, for which there is currently no standardized intervention. This will aim to improve physician implementation of exercise prescription, as there will be well-defined guidelines to follow.

Examining the rates of intimate partner violence documentation and staff awareness in an Emergency Department.

Janeske Vonkeman, Paul Atkinson, Jacqueline Fraser, Rose McCloskey

Introduction

Domestic violence rates in New Brunswick, specifically in Saint John, have been reported to be some of the highest in Canada. This statistic indicates the importance of identifying cases that present to the trauma and healthcare system. This process begins with an assessment of awareness of intimate partner violence (IPV) among frontline staff, as well as their current practices for detecting IPV. While the current patient chart in the ED has a field for suspected domestic violence (labeled as DV), we are currently uncertain whether patients are assessed for IPV and what the current documentation practices are. Therefore, our primary outcome will describe the current usage of the DV field as well as other forms of documentation. We will also describe the current rate of IPV identification. Our secondary outcome will describe the current awareness and knowledge of IPV questioning/case finding as well as willingness to implement a structured case finding tool.

Methods

A retrospective chart review was done to capture domestic violence documentation and detection rates. CEDIS complaints were screened by Falcicorp for injuries that could be caused by deliberate violence. Next, the triage note was used to exclude patients with an identifiable non-violent/non-accidental mechanism for their injury. Patient charts were then pulled and IPV case identification and documentation evaluated. The second phase of the study involved a cross-sectional survey of ED staff to evaluate IPV screening/case finding awareness and willingness to implement a new questioning tool.

Preliminary Results

Retrospective Chart Review 884 patient visits between January and April of 2015 were screened from a list of injury-related CEDIS complaints (n=2736) using i3 software. 508 charts were pulled and reviewed further. 366 patient visits met our inclusion criteria. 323 patient injuries were described as accidental from the history provided, 2 injuries were described as accidental from external evidence, and 27 visits were described as deliberate injuries. Overall, we found that 35/366 (9.6%) of cases had an unclear cause of their injury and 12/366 (3.3%) of cases had unclear documentation of their history. For deliberate injuries we assessed documentation of assailant identity and found that 1/21 (5%) were known to the victim, 3/21 (14%) were unknown, 1/21 (5%) were friends, 5/21 (24%) were partners. 11/21 (52%) had no documentation with regards to assailant identity. No documentation was noted in the DV field. We hope to further report on written documentation of IPV, current awareness and knowledge of IPV questioning in ED staff as well as willingness of staff to implement a structured case finding tool.

Impact

It is likely that emergency department staff will come across victims of intimate partner violence in their daily practice. It is important to determine the current rates and methods of current IPV documentation as it may help determine if there is a need to improve the process as it is a high-risk condition in a vulnerable population group.

Can communication skills training improve the Emergency Department workplace environment?

Munaha Mostofa, Michael Howlett, Jo-Ann Talbot, Jacqueline Fraser, Paul Atkinson

Introduction

Among all medical specialties, emergency medicine physicians experience the highest levels of burnout at over 60%. A large body of evidence outlines adverse outcomes of burnout for Emergency Department (ED) staff, which include lower job satisfaction and higher frequencies of suboptimal care. Several possible explanations may be linked to high risk of burnout amongst ED staff, such as individual parameters of coping mechanisms and work environment. There is a demonstrated relationship between coping styles and burnout in ED professionals: the use of more assertive, task-oriented coping is associated with reduced burnout, while emotion-oriented coping styles are predictive of increased burnout. Our objective is to determine if there is a need for communication skill training amongst ED staff in two tertiary care Emergency Departments in New Brunswick, and whether they will find an assertiveness training program in Crucial Conversations and Crucial Accountability provided by *VitalSmarts*® to be effective in improving their work environment.

Rationale

Previous studies have shown reduced burnout following communication skills and assertiveness training. Therefore, programs teaching positive, more assertive forms of communication and conflict resolution may improve coping skills, job satisfaction, social development and, in turn, sustainably reduce stress and burnout amongst ED staff in the long term.

Methods

All ED staff from the Saint John Regional Hospital (SJRH) and the Dr. Everett Chalmers Hospital (DECH) were asked to complete a survey package including a demographics and baseline questionnaire, which asks them to indicate whether they feel there is a need for communication training to improve their work environment. The participants from SJRH were then asked to participate in the assertiveness training intervention. This will be followed by a 5-month post-intervention refresher course, at which time, the participants will be asked to evaluate whether they anticipate the program will be helpful to them in communicating more effectively in their work environment.

Impact

Positive research outcomes could indicate that it would be useful to implement such a communication skills training program at an organizational level to improve work environment and job satisfaction in every department.

Does point of care ultrasound improve selected markers of resuscitation in patients with undifferentiated, non-traumatic shock?

Luke Taylor

Introduction:

Patients who present to the ED with undifferentiated, non-trauma associated hypotension are often affected by conditions with a prognosis largely dependent on the time taken from presentation to correction of their vital as well as metabolic derangements. Undifferentiated shock also carries an in hospital mortality of 20%, further proving the need for prompt diagnosis and management [1]. Therefore, any means available to decrease this time to normalization of vitals and laboratory studies must be explored. The SHoC-ED1 trial sought to investigate just one of those means, point of care ultrasound (POCUS). SHoC-ED1 was the first multi centre randomized controlled trial to compare POCUS in the treatment of adult patients presenting with undifferentiated hypotension (SBP<100mmHg or a shock index > 1.0) to those that did not get POCUS. The primary outcome of this study was to determine whether ultrasound improved the morbidity and mortality of hypotensive patients over those patients in which ultrasound was not used. The aim of this particular study is to utilize the data collected in SHoC-ED1 to test the hypothesis that POCUS improves the resuscitation of patients presenting with undifferentiated hypotension. This will be done by examining the change in shock index, MEWS score, acid-base balance, as well as lactate over the course of the resuscitation in both arms of the SHoC-ED1 study.

Methods:

Patient selection will involve utilizing the SHoC-ED1 database to retrieve adult patients who presented to selected EDs in Canada and South Africa from 2012 to 2016. The outcome measures will consist of Shock Index and MEWS score calculated using recorded vitals. Blood pressure, heart rate, respiratory rate, and temperature were collected both at presentation as well as at discharge allowing them to be analyzed for change. Venous acid base balance as well as change in lactate will also be analyzed using the data base. These laboratory values were collected initially and at four hours to assess for change. Again, both the POCUS arm of the study will be compared to that of the normal treatment to assess for any significant improvement in resuscitation.

Purpose:

The use of POCUS in the ED is fast becoming commonplace for various patient presentations. However the use of this modality in the hypotensive patient has not been thoroughly studied. A broad literature review reveals that there is data showing the efficacy of ultrasound in the diagnosis for cause of hypotension, however there are currently no published papers demonstrating its efficacy in regards to improving selected markers of resuscitation [3]. As such, it would be of great value to assess whether this point of care imaging modality is beneficial in the resuscitation of undifferentiated hypotensive patients presenting to the ED.

Reference:

- 1) Hall MK et. al: Impact of point-of-care ultrasonography on ED time to disposition for patients with nontraumatic shock. *Am J Emerg* 2016; 34: 1022-30
- 2) Atkinson et. Al: Abdominal and Cardiac Evaluation with Sonography in Shock (ACES): an approach by emergency physicians for the use of ultrasound in patients with undifferentiated hypotension. *Emerg Med J* 2009; 26: 87-91
- 3) Jones et. al: Randomized, controlled trial of immediate versus delayed goal-directed ultrasound to identify the cause of nontraumatic hypotension in emergency department patients. *Crit Care Med* 2004; 32:1703-8
Population: Adult ED patients with non-traumatic undifferentiated hypotension

Point of care ultrasonography in shock – ‘Hocus PoCUS’ or helpful diagnostic tool?

Mandy Peach

Introduction

Shock is a common presentation to the emergency department (ED). There are multiple etiologies, and mortality associated with undifferentiated shock can approach up to 50%¹. Accurately determining the etiology of shock is therefore integral to resuscitation efforts.

Point of care ultrasonography (PoCUS) is a diagnostic tool employed at the bedside that can quickly give a wealth of information². Some studies have shown that PoCUS is helpful in ruling out etiologies of shock³, improving diagnostic certainty^{4,5}, and has reasonable accuracy^{3,5}. However, supportive evidence for the use of PoCUS in hypotension is not expansive. Given that accurate diagnosis can substantially change management there is a need for more evidence on the benefit of PoCUS in diagnosing undifferentiated hypotension.

Research Question

The First Sonography in Hypotension and Cardiac Arrest in the Emergency Department (SHOC-ED 1) study is a multicenter, randomized controlled trial. In keeping with the objectives of this larger study, this project will access the data from SHOC-ED 1 to answer the following two-fold question:

Does the use of PoCUS change our diagnostic impression and improve diagnostic accuracy in the assessment of non-traumatic hypotensive patients presenting to the emergency department?

Methodology

Adult patients presenting to the emergency room with non-traumatic hypotension (SBP < 100 mmHg or shock index > 1.0) were consented to the study if they fell outside the exclusion criteria. Patients were assigned via pre-ordered, randomized sealed envelopes to either the treatment group – receiving standardized PoCUS protocol – or the control group receiving the standard of care excluding ultrasound. An initial diagnostic impression and differential was established for both groups upon arrival, with a second diagnostic impression 1 hour later. Final diagnosis upon discharge was recorded by 2 outside parties who interpreted the clinical and laboratory data.

To determine if PoCUS improves our diagnostic impression, initial impressions will be compared to secondary impressions after PoCUS using Fishers’ Exact Test. Odds ratios will then be used to compare diagnosis after PoCUS to the final diagnosis on discharge to assess accuracy. Together these will determine if PoCUS is helpful in improving diagnosis of shock and if it is an accurate tool.

Impact

The goal of this project is to add to the lacking evidence of the benefit of PoCUS in hypotensive patients, with hopes for eventual incorporation of ultrasonography in resuscitation protocols.

¹Strehlow, M. (2010). Early identification of shock in critically ill patients. *Emergency Medicine Clinics of North America*, 28(1):57-66.

²Atkinon, P., McAuley DJ., Kendall, RJ., Abeyakoon O., Reid CG., Connolly J., & Lewis, D. (2009). Abdominal and Cardiac Evaluation with Sonography in Shock (ACES): an approach by emergency physicians for the use of ultrasound in patients with undifferentiated hypotension. *Emergency Medicine Journal*, 26(2):87-91

³Jones AE., Tayal, VS., Sullivan, DM., & Kline, JA. (2004). Randomized, controlled trial of immediate versus delayed goal-directed ultrasound to identify the cause of nontraumatic hypotension in emergency department patients. *Critical Care Medicine*, 32(8): 1703-8.

⁴Haydar, S., Moore E., Higgins, G., Irish, C., Owens, W., Strout, T. (2012). Effect of Bedside Ultrasonography on the Certainty of Physician Clinical Decisionmaking for Septic Patients in the Emergency Department. *Annals of Emergency Medicine*, 60(3): 346-358

⁵Shokoohi, H., Boniface, K., Pourmand, A., Liu, Y., Davison, D., Hawkins K., Buhumaid, R. et al. (2015). Bedside Ultrasound Reduces Diagnostic Uncertainty and Guides Resuscitation in Patients With Undifferentiated Hypotension. *Critical Care Medicine*, 43(12): 2562-2569

Public Access to Epinephrine Auto-Injectors: Training A Community on Anaphylaxis Response

Robert Dunfield, Jaime Riley, Chris Vaillancourt, James French, Jacqueline Fraser, Paul Atkinson

Introduction

Anaphylaxis is a medical emergency that is often under-recognized and under-treated and can cause death. Public access to epinephrine auto-injectors (EAI's) through unlocked, alarmed cabinets is a novel concept. Making EAI's publicly available removes potential barriers to adequate emergency response times, such as locked desk drawers in classrooms and/or increased ambulance response times. Improved access to EAI's significantly improves treatment times and therefore survival rates of anaphylaxis. Making epinephrine publicly accessible hinges on the competency of the bystanders present during an anaphylactic event and their ability to respond in a timely and proficient manner. This emphasizes the need to develop an effective training process in which bystanders (e.g. teachers, coaches, waiters) effectively learn the necessary skills in delivering epinephrine.

Rationale

Developing an education process that promotes retention of proficient EAI use will set the standard for future community education on public response to anaphylaxis. Such a standard would also be applicable to other forms of public access to emergency interventions, including automated external defibrillators.

Methods

This prospective, randomized study will involve participants who are stakeholders belonging to the various sites at which public EAI cabinets will be installed throughout the Town of Hampton, New Brunswick. Thus far, 15 sites have been studied in Hampton with an expected 7 more sites to join this project. Sites are randomized to 1 of 3 experimental education groups: i) the didactic poster (DP) group, ii) the DP with video education (VE) group, and iii) the DP, VE, and simulation training group. Approximately 60 individuals are expected in each experimental group for a total of 180 participants. After participating in one of the three educational modalities, participants are asked to respond to an anaphylactic scenario and this is videotaped. Three months following the initial session, each site will be revisited for another assessment using the same process. All data will be reviewed by blinded healthcare professionals. Assessment scores will be consolidated for each group and analyzed using a one-way ANOVA.

Impact

Research outcomes could lead to improved community education in the delivery of publicly accessible epinephrine auto-injectors. This study will play an important role in the future of early anaphylaxis management and relief, and has already played a role in saving a man's life in the Sussex, NB area.