

A PREDICTABLE WEEKLY PATTERN IN ADMITTED PATIENTS AWAITING BEDS IN THE ED AND CORRELATION WITH ELECTIVE ADMISSIONS

Michael Drescher

Associate Chief Emergency Medicine, Hartford Hospital, Hartford Connecticut

Objectives: One of the characteristics of Emergency Department (ED) overcrowding is an increasing number of admitted patients ‘boarding’ in the department. This study set out to test whether there was a predictable weekly pattern of number of boarders, with their inherent problems for ED care and throughput‘ at one institution. We further examined the correlation between: a) number of elective admissions to the hospital, b) ED volume, and c) number of patients leaving without being seen (LWBS), with the number of patients boarding in the ED.

Methods: Hospital and ED administrative databases at a 80,000 visit urban hospital were retrospectively searched with IRB approval for the period Feb – April 2006. Data for each day included number of ED visits, number of patients boarding per shift, admissions to the hospital (elective and via the ED) and number of LWBS. Patients were counted in each shift they remained in the ED as a way to capture the duration of the potential overcrowding. Analyses of variance were run to test the effect of day of week (Monday through Sunday) on each outcome and descriptive variable. A repeated measure analysis of variance was run for number of boarders only to include effect of shift within day. *A priori* contrasts were set to test linear and quadratic effects and differences between weekday and weekend. When significant overall differences were found, Bonferroni post hoc pairwise comparisons were made. Pearson correlations were run between boarders and the other variables.

Results: We found significant differences in the number of admitted patients ‘boarding’ in the ED by day of week and hour of the day (shift): the number of boarders increased over the course of the week, peaking on Thursday and decreasing over the weekend ($p < .001$). The number during the day was significantly higher than night ($p < .001$). Elective admissions correlated with numbers of boarders ($p=0.01$) and were significantly fewer on the weekend than on weekdays ($p < .001$). ED visits did not vary significantly by day of the week, nor did ED admissions ($p=NS$) There were also significant differences in the number of patients LWBS weekends and weekdays ($p < .001$) and this was strongly correlated to the number of patients boarding in the ED ($p < .001$).

Conclusions: The number of patients boarding in the ED at this institution is not random and appears to follow a distinct pattern with number of boarders peaking midweek which is not accounted for by variation in ED visits or admissions. The data also show a statistically significant correlation between the number of elective admissions and number of boarders in the ED. Therefore, one may hypothesize that increasing elective admissions on the weekends in lieu of midweek could reduce boarding in the ED. This may also serve to reduce the number of LWBS. This intervention along with other factors that may effect hospital throughput, will require further studies.

A COMMON COMPLICATION OF UNCOMMON DISEASE

Dr. Jalal Ashkar M.D¹, Dr. Margarita Medvedovsky M.D²,
Dr. Pavel Peschansky M.D³

Emergency Department, Hillel Yaffe Medical Center

Hypoglycemia is a common emergency condition that is often seen in the emergency department. Acute hypoglycemia should be immediately considered in any patient with altered mental status. Unexpected and recurrent hypoglycemia in a non-diabetic patient necessitates further investigation.

We present a 30-year-old young man who was treated in our emergency department because of recurrent hypoglycemic episodes related to glycogen storage disease type Ia (Von Gierke disease). This is an extremely rare cause of hypoglycemia, especially in adult patients.

GSD is clinically manifested with fasting hypoglycemia – a hallmark of the disease, in addition to hepatomegaly, growth retardation and bleeding diathesis. The biochemical manifestations of this disease are: rapidly decreasing fasting blood glucose values, lactic acidosis, hyperlipidemia, and hyperuricemia. Long-term complications include hepatic adenoma, osteopenia and nephrolithiasis.

Von Gierke disease is an autosomal-recessive condition. It may be explained by mutations of the phosphohydrolase catalytic unit gene of the G-6-P complex, unlike GSD type Ib and GSD type Ic. Deficiency of G-6-P blocks the final steps of glycogenolysis and gluconeogenesis. This results in severe hypoglycemia.

In this case report, the patient presented with a common symptom – hypoglycemia – of an unusual disease - Von Gierke disease (GSD type Ia).

An emergency physician should keep in mind that Von Gierke disease may be manifested with additional emergency conditions, such as, gastrointestinal bleeding, nephrolithiasis, acute renal failure and osteoporotic fracture.

RECURRENT ANAPHYLACTIC SHOCK IN THE YOUNG MAN

DR. Jalal Ashkar M.D¹, DR. Margarita Medvedovsky M.D²,
DR. Pavel Peschansky M.D³

Emergency Department, Hillel Yaffe Medical Center

Systemic mastocytosis is a clonal disorder of the mast cell and its precursor cells. The clinical symptoms and signs of systemic mastocytosis are due to the accumulation of these clonally derived mast cells in different tissues, including bone marrow, skin, the GI tract, the liver, and the spleen.

Systemic mastocytosis, often termed systemic mast cell disease (SMCD), is characterized by mast cell infiltration of extracutaneous organs, which is in contrast to cutaneous mast cell disorders, which involve only the skin.

We present the case of an asthmatic 40-year-old male who had been treated several times in our emergency department for unexplained anaphylactic shock with diffuse urticarial lesions. It was decided to investigate the reason for this unexplained emergency condition. The patient's laboratory blood tests revealed a borderline normocytic anemia with mild eosinophilia and an elevated sedimentation rate. In light of these findings, a bone marrow biopsy was performed and revealed an excessive proliferation of mast cells. These clinical and pathological findings confirmed our presumptive diagnosis of systemic mastocytosis.

Because of the patient's broncho-spastic clinical picture, he had been treated with large doses of steroids. While undergoing this treatment, the patient had developed an acute psychotic state. The question arose as to whether the patient's symptoms were related to neuro-psychiatric manifestations of systemic mastocytosis or as a known side-effect of large doses of steroids?

This case illustrates the complex and problematic aspects of diagnosis and management of systemic mastocytosis.

IMPROVING NATIONAL PREPAREDNESS FOR BIOTERRORISM WITH INNOVATIVE EDUCATIONAL SOFTWARE

Idit Harari, Liat Tusk-Helerman, Zvi Dushnizki

CBRN Medicine Branch, Medical Corps I.D.F

Bioterrorism has become a major threat in the last decade. First responders, including primary physicians, emergency department staff, paramedics and laboratory technicians should therefore be capable to promptly recognize and treat casualties. Unfortunately, insufficient knowledge and awareness level of first responders comprise a worldwide problem for health systems. Despite abundant information on bioterrorism in the public domain. It seems that the wealth of information cannot be efficiently utilized on-site by first responders, mainly due to lack of time required for search and processing. Frontal lectures by experts provide a partial solution, but require professional teams, the time frame is nonflexible and amount of information is too large to be processed. Posters or information leaflets distributed among first responders provide concise data but lack the space for delivering all the information required to deal with any given bio-terror agent. We have developed interactive, on-line, educational software designed to train first responders how to deal with main bio-terror agents. The software focuses on four of Category A bio-terror agents and includes complete yet concise information about diagnosis, pathogenesis, histology, microbiology, treatment and protective measures. Great emphasis was placed on modularity of incorporated data, as well as on simplicity, "user friendliness" and visual demonstrativeness. Each chapter ends with a test that must be completed. All results are recorded to enable central score monitoring of personnel or even of entire institutions over a course of time. We believe that the software will become an important and cost-effective tool in increasing national preparedness to bioterrorism.

COMPREHENSIVE STUDY OF MYOCARDITIS AT THE ED (COSMED I): CLINICAL, ELECTROCARDIOGRAPHIC AND LABORATORY PRESENTATION.

Ariel G. Bentancur¹, Ben Ami Sela², Slava GavendoMSc², Avraham Zakuto DMD²,
Oren Agranat³, Rafael Kuperstein³, Shlomo Matetzky³

*From the Emergency Department¹, Pathologic Chemistry Institute², and the Heart Institute³,
The Sheba Medical Center, Tel Hashomer; Affiliated to the Sackler School of Medicine, Tel
Aviv University, Israel.*

Introduction: The acute onset of unexplained cardiac symptoms is frequently explained by a critical obstruction of the coronary flow. If the obstruction is prolonged enough the resulting ischemia will produce necrosis of the myocardium and the release of cardiac proteins to the circulation. Myocarditis, the inflammation of the heart muscle may be responsible for a similar clinical picture, but has not been deeply studied at the ED.

Methods: This was a double phase, prospective and retrospective observational study based at the ED originally aimed to non-invasively diagnose acute myocarditis, and to establish the relation between inflammatory markers and the risk of life threatening ventricular arrhythmia. The clinical, laboratory, electrocardiographic, and echocardiographic features of 61 consecutive patients (originally 63, 2 excluded from this analysis because they were outpatients without enough data), 43 prospectively (data collected at the ED) and 18 retrospectively (data collected at the department), with acute onset myocarditis (case group) at the Sheba Medical Center were studied during a 3 year period in order to define the incidence, clinical, electrocardiographic and laboratory characteristics of myocarditis at the emergency department. Patients were excluded from the study if they had a history of: coronary or valvular heart disease, dementia, active malignancy, or if aged less than 18.

Results: Demographic characteristics, clinical findings, and outcomes are described in Table I.

Characteristic Per history	Number (%)	Clinical findings	Number (%)	Outcomes	Number (%)
Total Number	61 (100%)	Temperature (°C) >37.5	7 (11.47)	ED Diag. Myocarditis	29 (47.54)
Age < 30	21 (34.42)	Pulse >100 p.m.	16 (26.23)	ED Diag. ACS	9 (14.75)
Age 30-45	29 (47.54)	O ² saturation (RA) <97%	7 (11.47)	ED Diag. STEMI	5 (8.2)
Age >45	11 (18.04)	Syst. BP <100	4 (6.55)	Diag. other	18 (29.5)
Female gender	9 (14.7)	Diast. BP <60	5 (8.2)	Admission to OU	14 (22.95)
Derived	31 (50.8)	Tonsillitis	26 (42.62)	To ICCU	25 (41)

Transported	9 (14.75)	Arrhythmia	1 (1.6)	To intermediate ICU	10 (16.39)
Prehosp. Diag. myocarditis	3 (4.91)	ST depression >0.5 mm	4 (6.55)	To Int. Med.	8 (13.11)
Prehosp. Diag. ACS	6 (9.82)	ST elevation \geq 1 mm	34 (55.73)	Other	1 (general ICU, 1.6)
Smoking	23 (37.7)	T wave inversion	15 (24.59)	Length of stay (days, mean)	4.7 \pm 2.9
HTN	5 (8.2)	Wall distribution inf-lat	52-62.3%	Length of stay >1 week	10 (16.36)
DM	2 (3.27)	IVCD	11 (18.03)	Ventricular arrhythmia	6 (9.83)
Chest pain	51 (83.6)	PR depression	11 (18.03)	Coronary angiography	17 (27.86)
Epig. Pain	7 (11.47)	CXR cardiomegaly	13 (21.31)	Cardiac CT	17 (27.86)
Time of onset <3hs	40 (65.58)	CXR congestion	6 (9.8)	Cardiac MR	24 (39.34)
Time of onset >3hs	21 (34.42)	CXR condensation	7 (11.47)	Heart Scan	4 (6.55)
Pressure pain	49 (80.32)	ESR >30mm/hr	30/52 (57.69)	CHF treatment upon discharge	19 (31.14)
Irradiated pain	28 (45.9)	WBC >10.000	30 (49.18)	Death (1year)	0
Increase with insp.	15 (24.6)	Neutrophiles >74%	24/59 (40.67)	Pericardial Effusion	6 (9.83)
Throat sore	39 (63.93)	Elevated CPK > 170 IU/L	45/59 (76.27)	Ventricular Dilatation	7 (11.47)
Febrile history	52 (85.24)	Elevated MB > 5%	44/59 (74.57)	Ventricular Hypertrophy	1 (1.6)
Dyspnea	20 (32.78)	Elevated Tr I > 1 micg/L	51/60 (85)	LVEF <40	9 (14.75)
Diarrhea/Vomiting	18 (29.5)	Elevated Fibrinogen	10/11 (90.9)	LVEF 40-55	19 (31.14)
Lapse from onset (days)	6.6 \pm 7.93	Elevated D-Dimers	9/22 (40.9)	LVEF mean \pm SD	52.7 \pm 13.3

Conclusions: Myocarditis is far more common than previously recognized among patients without a history of cardiac disease and with acute chest pain at the ED. Most patients are young males, with a short febrile disease. The most common chief complain is chest pain that mimics ischemia pain. Because ST segment ECG elevation is frequent patients are misdiagnosed as suffering from ACS. A significant percentage of these patients undergo unnecessary urgent coronary angiography when diagnosed with acute STEMI.

COMPREHENSIVE STUDY OF MYOCARDITIS IN THE EMERGENCY DEPARTMENT (COSMED IV): THE VALUE OF N-PRO BNP AND HS-CRP IN THE DIAGNOSIS OF SUSPECTED MYOCARDITIS IN THE EMERGENCY DEPARTMENT

Ariel G. Bentancur¹, Ben Ami Sela², Rafael Kuperstein³, Oren Agranat³, Shlomo Matetsky³

¹*Emergency Medicine Department,* ²*Pathologic Chemistry Laboratory,* ³*Heart Institute of the Sheba Medical Center, Tel Hashomer, Associated to the Sackler School of Medicine, Tel Aviv University, Israel.*

Introduction: Brain Natriuretic Peptide (BNP) is primarily synthesized in the ventricles of the heart (1, 2). BNP is stored as a pro hormone within secretory granules and is secreted as an N-terminal fragment, N-proBNP (proBNP), and a smaller active hormone, BNP. They both have short circulating half lives (3). BNP and pro-BNP levels directly correlate with the severity of heart failure (4).

Acute myocarditis is a multi-etiological inflammation of the myocardium, usually due to viral infection. Because BNP gene expression occurs rapidly in response to stimulus, we postulated that it may be elevated when end diastolic ventricular pressure is elevated because of myocardial wall inflammation and swelling, even before symptoms and signs of heart failure develop.

As myocarditis is an acute inflammatory disease with functional sequel, we found reasonable that the combination of N-terminal pro BNP NT (pro-BNP) and an inflammatory marker could be used to determine the severity of injury at the acute inflammatory phase of this disease. This study evaluates if High sensitivity CRP (HS-CRP) elevation is early, and parallel the elevation of BNP, and if the product of both markers when tested at the ED are of diagnostic and prognostic value for acute myocarditis.

Methods: We prospectively performed a clinical history and a physical examination, conducted electrocardiographic and echocardiographic studies, and measured troponin, proBNP, and HS-CRP levels upon arrival to the ED to consecutive patients being clinically diagnosed as suffering from Acute Myocarditis, and to two matched control groups. All blood samples were withdrawn at the ED and tested by an Elecsys pro BNP test (Roche Diagnostics Corporation, IN, USA), a highly sensitive electrochemoluminescence immunoassay (ECLIA) based on a sandwich format. The sensitivity of the assay is 5 pg/ml and the intra-assay coefficients of variation is <3%. The assay's functional sensitivity is <50 pg/ml. Pro BNP abnormal levels were pre-established at a 300 pg/ml value. Statistical analysis was performed using a Student's one tailed test.

Results- A total of 42 patients with acute myocarditis (study group, SG) were included. Two control groups, control group one (CG-1) composed of chest pain/CHF in febrile disease patients (n=35), and control group two (CG-2) composed by patients with a first ST elevation myocardial infarction (n=35), were studied at the ED.

N-T pro BNP were significantly higher in the myocarditis group than in the two control groups. Mean levels by groups were SG 1672 ± 3802 pg/L, CG-1 151 ± 217 pg/L ($p=0.01$), and CG-2 573 ± 760 pg/L ($p=0.05$). CRP levels were non-significantly higher in the acute

myocarditis group. Mean levels of CRP were 74.27 ± 68.9 mg/L for the SG, 55.56 mg/L for CG-1, and 14 mg/L for CG-2. The N-T pro BNP/CRP product was significantly higher in the SG when compared to both control groups (SG 173349 versus CG-1 17763 ($p=0.015$); and versus CG-2 14602 ($p=0.015$)).

Conclusions: Our results show a significant elevation of inflammatory markers and N-T pro BNP levels in patients with acute myocarditis of different etiologies.

As expected the pro-BNP levels were comparable between the myocarditis and the ischemia group, but the HS-CRP were significantly higher. Also as expected, the HS-CRP levels were comparable between the myocarditis and the chest pain-febrile disease control group, but the pro-BNP levels were then significantly higher. The HS-CRP/pro-BNP product was significantly higher in the acute myocarditis group.

COMPREHENSIVE STUDY OF MYOCARDITIS AT THE ED (COSMED V): ENDOTHELIAL ACTIVATION, OXYGEN STRESS, AND BRAIN NATRIURETIC PEPTIDE IN ACUTE MYOCARDITIS.

Ariel G. Bentancur¹, Ben Ami Sela², Slava Gavendo MSc², Avraham Zakuto DMD²,
Oren Agranat³, Rafael Kuperstein³, Shlomo Matetzky³

¹*Emergency Department,* ²*Pathologic Chemistry Institute, and* ³*Heart Institute,
The Sheba Medical Center, Tel Hashomer; Affiliated to the Sackler School of Medicine, Tel
Aviv University, Israel*

Introduction: Acute Myocarditis is generally associated with a good prognosis. A small but significant percentage of the patients' progress to dilated cardiomyopathy and myocarditis is one of the leading causes of non-traumatic sudden unexpected death in the young. Marked endothelial activation has been demonstrated to be associated to myocardial viral persistence and bad prognosis. We hypothesized that acute self resolving myocarditis will have different degrees of endothelial activation and oxidative stress, as reflected by levels of asymmetric dimethyl arginine (ADMA) and ischemia modified albumin (IMA). Second, we hypothesized that the levels of these markers will be related to N-terminal pro-Brain natriuretic factor (N-T proBNP), a marker of ventricular wall stress and ventricular function. Third, we hypothesized that most severe patients would have higher levels of these markers.

Methods: To test these hypotheses we studied IMA and ADMA levels on twenty patients presenting with acute myocarditis at the emergency department (ED), and age and sex matched healthy controls. Patients with myocarditis were followed up for ventricular size, systolic ventricular function, documented episodes of ventricular arrhythmia, and congestive heart failure treatment upon discharge.

Results: IMA level was higher in tested patients with acute myocarditis compared with controls (0.3785 ± 0.1157 versus 0.26392 ± 0.046 , $p=0.0491$).

Four patients tested for ADMA had elevated levels.

High IMA and ADMA levels were associated with the development of cardiomyopathy and HF treatment upon discharge (38, 46 % versus 0 of patients with normal levels).

Overall, four patients developed ventricular tachycardia; they had normal ADMA levels, but elevated IMA levels upon arrival. Though they had a normal ventricular size and function by echocardiography, their mean N-T proBNP levels were above normal (657.5 ng/ml).

Nine patients (81.8%) had elevated IMA levels. Five of them either developed dilated cardiomyopathy or had a documented episode of ventricular tachycardia.

Conclusion: Acute myocarditis was associated with an elevated oxygen stress and different degrees of endothelial activation, which have been previously related to viral persistence, and further myocardial damage. High levels of IMA or ADMA were associated with a worst long term outcome. In acute myocarditis, ventricular arrhythmia and the risk of sudden death appear to be related to elevated oxygen stress, but unrelated to endothelial activation or dilated cardiomyopathy.

הערכת שביעות רצון של דפי הנחיות למטופלים עקב גפה מגובסת, חבלה בקרסול ופגיעה בעמוד שדרה צווארי במיון אורטופדי של המרכז הרפואי האוניברסיטאי "סורוקה"

מיכל פינזר, פרנסין לאוטמן, גלית יחיא, אילנה מסד

המחלקה לרפואה דחופה, המרכז הרפואי האוניברסיטאי סורוקה, באר שבע

רקע: בשנת 2005 פנו למיון אורטופדי 23,196 מטופלים מגילאים וממוצאים אתניים שונים. מספר זה לא כולל ייעוצים המופנים ממיונים אחרים. מטרת עבודה זו היא לטייב את הטיפול בחולים עקב גפה מגובסת, חבלות בעמוד שדרה צווארי וחבלות בקרסול. אחד המדדים לאומדן שביעות רצון מטופלים הוא איכות הטיפול הרפואי והקניית כלים להמשך טיפול עצמי בבית - self care. לשם כך ניבנו דפי הסבר, מידע והנחיות בעברית ותורגמו לאוכלוסיה הדוברת רוסית, וערבית לאוכלוסיה הבדואית. יש בהם התייחסות למהות הפגיעה, המשך טיפול, התנהגות מומלצת בבית, ציוד עזר מומלץ ומתי יש לפנות שוב לרופא.

שיטה: נבנו שאלוני שביעות רצון, אשר תוקפו על אוכלוסיית היעד. הודגמו 75 מטופלים בגילאים שונים מכלל הקבוצות. (לא כולל חיילים). השאלון כלל פרטים דמוגרפים ואישיים, סיבת הפניה ואפיון הפגיעה, שביעות רצון מהטיפול במיון האורטופדי כולל כל התחנות כרנטגן וחדר גבס, התייחסות לזמני המתנה, לשינוע והערות. לאחר כשבוע עד 10 ימים נוצר קשר טלפוני עם המטופל, ההורה או המלווה לבחינת יעילותם של דפי ההנחיה ושביעות הרצון.

תוצאות: 93% עד 97% מהמשיבים העניקו ציוני שביעות רצון גבוהים להסברים שניתנו, ליחס הצוות, ולאפשרות לשאול שאלות. 97% נעזרו בדף ההסבר. 86% טענו שסופק להם מידע שלא היה ידוע להם. חוסר שביעות הרצון נקשר לזמני המתנה, שינוע שאינו תמיד זמין, לחץ ועומס מטופלים.

יישום המסקנות: * הדפסה צבעונית של 3 עלוני דפי ההסבר. כל פגיעה בשלוש השפות.

* הותקנה עמדה לכיסאות גלגלים בלעדית לפונים למיון האורטופדי – יעילות בשינוע.

* החולים אינם ממתנינים ברנטגן לקבלת הצילומים. אלה נשלחים ישירות למחשבים בעמדות הרופאים במיון האורטופדי – חיסכון בזמן.

* הותקנה טלוויזיה רבת ערוצים בחדר המתנה.

* ילדים עד גיל 5 מתקבלים ללא תור.

* נבנית תכנית לימודים לאחים/יות המסמיכה אותם לשלוח מטופלים עם חבלות גרמיות מינוריות לצילומים על פי נוהלי משרד הבריאות.

HOSPITAL PREPAREDNESS FOR MEGA MASS CASUALTY INCIDENT- A NATIONAL PILOT DRILL

Odeda Benin-Goren, PhD, RN, CEN¹, Ayala Lior, MsC, LLB, RN.²
Ofer Lehavi, MD³. Avi Hassner, MD⁴ Pinchas Halpern, MD⁵

¹ *PhD, R.N, CEN, Director, Center for Resuscitation, Emergency Medicine Education and Emergency Services. TASMC. Israel;* ² *L.L.B, MA, R.N. Head Nurse, Emergency Department. TASMC. Israel;* ³ *MD, Medical Director, Emergency Services. TASMC. Israel;* ⁴ *MD. Deputy Director General. TASMC. Israel;* ⁵ *Pinchas Halpern, MD, Chair, Emergency Department. TASMC. Israel*

During the last six years, the security situation in Israel forced us to be prepared for disasters. Based on our previous experience there is no question if terror will strike us, but when and where it will happen.

The health system (including hospitals and Emergency Medical services {EMS}) is in constant alert for Mass Casualty Incidents (MCI) and disasters.

On April 2006 Tel Aviv Sourasky Medical Center (TASMC) (a level one trauma center) practiced for the first time the Rapid Response System (RRS) for Mega MCI, together with the Home Front Command (HFC), Magen David Adom (the National Israeli ambulance services- EMS) Israeli Police Forces and the National Train System.

It was the first time that such a drill was conducted with the cooperation of all agencies that are involved in a disaster.

Milestones of the drill and evaluated topics in the medical center included:

- About 600 nurses, physicians and para-medical personnel took part in the drill.
- Operation of MCI sites and expanding hospital surge capacity.
- Call up system.
- Activation of computerized information center for the public.
- Incident Command System, Headquarters operation, and command and control of the event.
- Triage in mega MCI
- Overload of the medical center that required secondary evacuation after performing life saving procedures.
- Activation of the roof helipad for observing injured and for second evacuation.
- Communication with HFC, EMS, and cooperation with them while activating secondary evacuation.
- Staff deployment.

There is no doubt; drills are necessary to control preparation activities, as an assessment tool, and for enhancing “collective and accumulative memory”. Drills provide us with lessons and conclusions which are implemented later on.

Activation of RRS is fundamental in controlling the event

The paper will present the preparedness and follow up of the drill and the practice of RRS in all sites of the medical center.

MANAGEMENT OF DISTAL RADIAL FRACTURES IN YOUNG PATIENTS BY NON-ORTHOPEDISTS IN AN URGENT CARE CENTER

Deena R. Zimmerman, Nahum Kovalski

TEREM Emergency Medical Services, Jerusalem, Israel

Background: In younger patients, many distal radial fractures involve minimal bony disruption and are referred to as "greenstick" fractures. A number of studies have indicated that many such fractures may even be managed with elastic bandaging alone, rather than plaster splints. Therefore, for managing such injuries, there would appear to be little need for immediate orthopedic evaluation. This statement assumes that the initial Xray assessment (to identify the presence and severity of the fracture) is accurate even without on-site review by a radiologist or orthopedist. We decided to study our experience in TEREM both in relation to accuracy of Xray interpretation as well as the success of management of distal radial fractures in young patients.

Materials and Methods: TEREM is a privately owned medical services company that establishes and manages freestanding emergent care clinics. TEREM's central clinic, located near the entrance to Jerusalem, is open 24 hours per day, 365 days per year. An orthopedist is on site in this clinic, for approximately 6 hours daily. Four other TEREM clinics (in and around the Jerusalem municipality) are open evening and weekend hours but do not have an on-site orthopedist at any time. All five clinics provide on-site radiology during all operating hours. TEREM uses a proprietary computer system to register, clinically manage and administer all visits to these clinics.

Results: From 01/02/2006 to 30/09/2006, there were a total of 883 visits (all five clinics combined) for patients under the age of 15 years, which included an Xray for a case of forearm trauma.

611 (69%) of all 883 visits were managed by a non-orthopedist without the real-time involvement of a radiologist or orthopedist. The non-orthopedist diagnosed a distal radial fracture in 253 (41%) of these visits. In 11 (4.3%) of these 253 visits, the radiologist read the film as normal (i.e. over-call by the non-orthopedist). In 38 (10.6%) of the 358 visits where the non-orthopedist read the film as normal, the radiologist identified a distal radial fracture (i.e. under-call by the non-orthopedist). TEREM's computer system tracks all visits with cases of under- and over- calls and automatically informs a senior physician of these visits. All patients with under-calls were contacted within 24 hours of the initial visit to TEREM, by this senior physician. Based on the initial Xray and the patient status, the senior physician described a follow up plan with the patient. For all over-call visits, there were already clear instructions on the chart to be in orthopedic follow up.

272 (31%) of all 883 visits were managed by an orthopedist. In almost all cases, the orthopedist examined the patient after an initial evaluation by a non-orthopedist. The orthopedist diagnosed a distal radial fracture in 239 (88%) of the 272 visits. In 8 (3.3%) of these 239 visits, the radiologist read the film as normal (i.e. over-call by the orthopedist). In 2 (6.1%) of the 33 visits where the orthopedist read the film as normal, the radiologist identified

a distal radial fracture (i.e. under-call by the orthopedist). These 2 under-call visits were contacted and referred for further follow up. For all over-call visits, there were already clear instructions on the chart to be in orthopedic follow up.

The differences in under-call and over-call rates, between orthopedist and non-orthopedist, were both not significant (2 x 2 chi-square test).

Of the total of 492 visits that had a distal radial fracture diagnosed at the time of the visit, all but 10 of the cases had a plaster splint applied.

Conclusions: Non-orthopedists can reliably identify and manage trauma cases that are suspicious for fractures of the distal radius. In combination with radiologist review within 24 hours, as well as a call-back follow-up system by a senior physician, initial under-calls will still be appropriately managed. Significant monies can therefore be saved, as management of these cases in an urgent care center is less expensive than direct ED care.

TRENDS IN THE USE OF DIAGNOSTIC IMAGING IN EMERGENCY ROOMS OF TRAUMA CENTERS IN ISRAEL (2001-2005)

Maya Siman-Tov¹, Limor Aharonson-Daniel², Kobi Peleg³

¹*The Israeli National Center for Trauma and Emergency Medicine Research*, ²*The Gertner Institution for Health Policy and* ³*Epidemiology, Sheba Medical Center Tel-Hashomer*

Background: Recent research points to the significance of prompt diagnostic imaging procedures of trauma patients in the Emergency Department (ED).

Placing the CT scanner near, or even in the ED, reduces the time necessary to diagnose trauma patients and gives a more timely indication for the necessary treatment.

Aim: To examine trends in the use of diagnostic imaging in the ED, particularly CT, in trauma patients hospitalized at trauma centers in Israel between 2001 and 2005.

Methods: Retrospective analysis of data on hospitalized trauma patients recorded in the Israel national trauma registry between 1.1.2001-31.12.2005 at nine hospitals, six level I trauma centers and three regional trauma centers. Data included injury diagnoses and imaging procedures conducted in the ED. Data was analyzed using SAS statistical software.

Results: 109,636 admissions to the ED were included. An increase in CTs performed was noted for all severity groups ranging from 20% in hospitalized casualties with critical injuries (ISS 25+) to 58% in mildly injured patients (ISS 1-8). The significant increase was noted in all CTs: chest, abdomen, spine and head. Concurrently, between the years 2003 and 2005 there was a decrease of 23% in Ultrasound (US) scans in the ED, while the use of X-RAY remained constant with a small increase. The physical location of the CT scanner in relation to ED location, was found to affect the number of CTs performed.

Conclusions: In recent years an increase in CT procedures to hospitalized trauma patients in Israel has been noted. This trend, together with the entrance of CT scanners into or near-to the ED, can improve the diagnosis of trauma patients and contribute to the betterment of care provided. However, it is interesting to note that the largest increase was for supposedly "non urgent" diagnoses, as indicated by low ISS scores.

SEATBELTS IN SCHOOL BUSES: ARE THEY SAFE FOR OUR CHILDREN?

Dr. Kobi Peleg and Sharon Goldman

The Israel National Center for Trauma and Emergency Medicine Research, The Gertner Institute, Tel Hashomer

In March 2005, the Minister of Transportation passed new regulations in an effort to increase the safety of children traveling by school transportation in Israel. As of September 1, 2006 all school buses are required to have installed seatbelts for the 280,000 pupils whom travel daily by means of school transportation. The new traffic regulation states "type of seatbelt - lap belt or other seatbelt that is installed". While it is known that seatbelts in private cars save lives, incorrect usage and inappropriate seatbelt types can cause serious injury among children.

The objective of this study was to perform a review of the professional literature in order to determine the efficacy of lap restraints among children and its association with severe injuries.

The professional research regarding seatbelt use in children has shown that lap restraints can cause serious injury, even in low speed motor vehicle accidents. The abdominal area and bone structure of young children are not adequately developed to take the force of a lap restraint. As a result, lap restraints are associated with abdominal and other internal injuries, lumbar fracture-dislocations and contusions across the abdomen, known as the "seat-belt syndrome". The National Highway Traffic Safety Administration (NHTSA) reported that lap restraints are not effective for preventing injury among children traveling by bus. Moreover, children have a two to three fold risk of severe injury; including head, spinal and abdominal injuries (seat belt syndrome) when using lap only restraints. It should be noted that the National Pediatric Trauma Registry in the U.S. reported that among pediatric patients with blunt abdominal trauma, 9% die. Lastly, children 5-14 appear to derive the greatest incremental benefit from using lap/shoulder belts rather than just a lap belt and lap/shoulder belts may reduce abdominal injuries by 52 percent relative to lap belts only (NHTSA).

While policy makers aimed to implement regulations, which will prevent injuries and fatalities associated with school transportation, the decision to enforce use of seat belts on buses is questionable and the potential for severe injury among children resulting from lap restraints should not be disregarded.