LETTERS TO THE EDITOR

Acute myocardial infarction in patients with left bundle branch block

EDITOR.—We read with interest the paper about the electrocardiographic diagnosis of acute myocardial infarction (AMI) in patients with left bundle branch block (LBBB).

It is essential that accident and emergency staff recognise this group of patients so that thrombolysis is delivered promptly. Shlipak et al reviewed patients presenting with LBBB and an acute cardiopulmonary history and assessed the usefulness of the Sgarbossa criteria. They found that these criteria had a sensitivity of 92% and a specificity of 100%. Although an ECG that satisfies the criteria is almost certainly indicative of AMI, most (90%) patients with AMI will not meet the criteria. If thrombolytic treatment were withheld until the criteria were met, few patients in this high-risk group would receive appropriate treatment.

Rather than relying on the Sgarbossa criteria, we feel it would be more appropriate to thrombolise all patients (except those with contraindications) who have a history suggestive of AMI and LBBB. This policy is supported by the data of Shlipak et al.

Matt Shepherd
Registrar
Richard Hardern
Consultant, Acute Medical Assessment Area, The General Infirmary, Great George Street, Leeds LS1 3EX

The authors reply

We read with interest the comments of Shephard and Hardern concerning our article. In large part, we agree with their thoughts. In our report, we stressed several points, including (1) the confounding effect of LBBB pattern on the electrocardiographic diagnosis of AMI; (2) the “normal” or expected findings of LBBB; and (3) the potential electrocardiographic strategies to assist in identifying the patient with a potential AMI. Several electrocardiographic strategies are available to the clinician to assist in this endeavour such as comparison with old ECGs, examination of serial ECGs, and a sound understanding of the anticipated ST segment changes resulting from LBBB. These strategies may be supplemented by the clinical decision rule developed by Sgarbossa et al.

Since our report was published, recent literature has suggested that the Sgarbossa et al clinical prediction rule is less useful than reported. The first such investigation, not noted by Shephard and Hardern, who applied the Sgarbossa et al criteria to patients with chest pain and AMI in the emergency department of a North American hospital, found much less promising results—a very low sensitivity coupled with poor interobserver reliability. And, as noted by Shephard and Hardern, a second study investigated the diagnostic and therapeutic impact of this criteria—none effectively distinguished the patients who had AMI from those patients with non-coronary diagnoses. The authors concluded that electrocardiographic criteria are poor predictors of AMI in LBBB situations and suggested that all patients suspected of AMI with LBBB should be considered for thrombolysis. As we stated, even if the ECG is normal, it is a useful tool in the evaluation of the patient with LBBB and AMI.

Traditional criteria for administration of thrombolytic agents in the AMI patient most often involve electrocardiographic ST segment elevation situated in an anterior distribution; the presence of a new LBBB pattern represents another electrocardiographic criterion for such treatment. Shephard and Hardern suggest that all patients with LBBB pattern presumably regardless of its chronology and a history suggestive of AMI receive a thrombolytic agent. Such an approach is potentially dangerous to the physician who has a high suspicion of AMI and is comfortable initiating thrombolysis based solely on clinical information—in other words, an analysis of the patient’s history and physical examination. Physicians, however, may be uncomfortable administering a thrombolytic agent under such circumstances; in fact, patients with electrocardiographic LBBB and AMI less often receive thrombolysis despite an increased risk of poor outcome and a higher mortality for significant benefit. The clinician must realise that all patients with chest pain, electrocardiographic LBBB pattern without obvious infarction, and clinically presumed AMI, only a minority will actually be the patient with the myocardial infarction. Treating all such patients with LBBB and presumed AMI will subject a number of non-infarction patients to the not insignificant risks and expense of thrombolysis.

Relying on having witnessed an endotracheal tube “pass through the cords” and depending on clinical signs is hazardous in the multiply injured patient. Capnography should be considered mandatory in any patient requiring intubation, especially as an adjunct to clinical examination. The endotracheal tube must be replaced immediately in any patient not in cardiac arrest in whom ETCO2 is not detected.

Endotracheal intubation continues to remain the “gold standard” for airway management for patients in cardiac arrest. The standard clinical signs widely used to confirm endotracheal intubation are again potentially unreliable and capnography is unhelpful. The use of a lit tracheal stylet (for example Trach-light Stylet and Trachlight Lightwand, Rusch Inc, Duluth, GA, USA), inserted through the endotracheal tube after intubation, can very reliably confirm correct tracheal placement by transillumination of the soft tissues of the neck. This simple technique may help to reduce the tragedy of failure to recognise oesophageal intubation in critically ill patients.

John J M Black
Fleet Medical Officer, Medical Centre, MY Golden Odyssey, c/o 3602 Rousseau St, Dpt 487, Swift Current, Canada S9A 2T1
David V Skinner
Consultant in Accident and Emergency Medicine, John Radcliffe Hospital, Headington Way, Oxford OX3 9DU

Confirmation of correct endotracheal tube placement

EDITOR.—We were disturbed to note from the survey of Florance et al that fewer than 50% of “major” accident and emergency departments in East Anglia report having any facilities for end tidal carbon dioxide (ETCO2) monitoring available for trauma patients.

All emergency departments in North America that manage trauma patients routinely keep in their trauma rooms at least a capnograph device for airway management. Our rationale for doing so would be considered indefensible in the event of an adverse airway event (R N Walls, personal communication).

Relying on having witnessed an endotracheal tube “pass through the cords” and depending on clinical signs is hazardous in the multiply injured patient. Capnography should be considered mandatory in any patient requiring intubation, especially as an adjunct to clinical examination. The endotracheal tube must be replaced immediately in any patient not in cardiac arrest in whom ETCO2 is not detected.

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John J M Black
Fleet Medical Officer, Medical Centre, MY Golden Odyssey, c/o 3602 Rousseau St, Dpt 487, Swift Current, Canada S9A 2T1
David V Skinner
Consultant in Accident and Emergency Medicine, John Radcliffe Hospital, Headington Way, Oxford OX3 9DU

The authors reply

We would like to thank Black and Skinner for their interest in our survey. Since then, one more department has acquired a capnograph, with more contemplating purchase. We hope this trend will continue.

We agree that capnography is essential in patients who require endotracheal intubation.

and is a minor monitor for anaesthesia in the UK and the USA. We have no experience of the “lit tracheal stylet” and so cannot comment on its usefulness.

However, we question whether capnography is unhelpful in cardiac arrest. The level of carbon dioxide has been correlated with survival in cardiac arrest and the ability to resuscitate. After cardiac arrest in patients already intubated, for example during surgery, ETCO₂, levels are invaluable in guiding resuscitation (personal experience RG).

In summary, capnography provides useful information about the correct placement of an endotracheal tube (“A”), the adequacy of ventilation (“B”), and the perfusion of the lungs (“C”).


Anaesthetic training for specialist registrars in accident and emergency

EDITOR,—Accident and emergency (A&E) trainees are required to spend a minimum of three months on secondment to anesthetics and the intensive care unit (ICU) if they have not already obtained adequate anaesthetic/ICU experience before entering the specialty. The depth and breadth of experience varies widely. Sometimes, the trainee is purely supernumerary and gains little experience other than placing laryngeal masks and endotracheal tubes. We have each been fortunate enough to spend six months as trainee senior house officer (SHO) anaesthetists as part of our rotations. We feel that this offers considerable benefit to our training as A&E specialists and recommend it to other A&E trainees.

Anaesthetics is unlike any other clinical specialty. It is impossible to start as the sole “on call” anaesthetic SHO on the first day. Hospitals vary, but most train their new SHOs over three months before allowing them onto the on call rota. In our six month secondments we participated in the on call rota and have benefited from the responsibility of acute decision making. We have become increasingly competent in preanaesthetic assessment, sedation, pain management (including regional anaesthesia), and the induction, maintenance, and recovery phases of a general anaesthetic. We have performed rapid sequence induction independently. Our improved confidence in the management of the airway has to be good for patient care, especially as we often provide initial airway control before the anaesthetist arrives in the A&E department.

A greater understanding of anaesthetic problems and equipment will be increasingly important for A&E consultants as anaesthetists and the common role in airway management and ventilatory and circulatory support in critically ill patients. We propose that every A&E trainee requiring an anaesthetic secondment undergo six months of anaesthetic self-experience with the same commitment and training as a career anaesthetist SHO.

To achieve this, A&E training programmes should routinely allow the trainee to be released to SHO posts in anaesthetics and intensive care for six months. This could be at another hospital, although salary issues would need to be addressed in advance. These include salary protection at the specialist registrar grade, and how much each trust and postgraduate deanery pay.

We accept that both the quality and quantity of dedicated anaesthetic SHOs must be maintained. However, six month slots could still be allocated on a competitive basis, and an anaesthetic specialist registrar or SHO could undertake a similar secondment in A&E on an exchange. A&E medicine has a lot to offer, particularly in those departments that perform regional anaesthesia, rapid sequence induction, advanced life support, and advanced trauma life support without initially involving the on call anaesthetist.

A. BOYLE
Specialist Registrar,
Peterborough District Hospital,
Thorpe Road,
Peterborough PE3 6DA

R. FLORANCE
Specialist Registrar,
Queen Elizabeth Hospital,
King’s Lynn

R. MACKENZIE
Specialist Registrar,
Ipswich Hospital

Casemix Healthcare Resource Group update

EDITOR,—The accident and emergency (A&E) medicine clinical working group of the Casemix Office (part of the NHS Information Authority) has selected six pilot sites to take part in a study leading to refinement of the A&E medicine Healthcare Resource Group (HRG). The chosen sites are as follows (attendances in previous year in thousands):

- Leeds General Infirmary (96)
- Derbyshire Royal Infirmary (78)
- Sandwell District General Hospital (72)
- Princess Alexandra Hospital, Harlow (60)
- Stoke Mandeville Hospital (59)
- Harrogate District Hospital (35)

Other departments are thanked for submitting high quality bids but it was essential to represent a broad cross section of emergency departments.

The current HRG A&E casemix measure version 1.0 uses disposal data that are already collected and are generally comprehensible. The A&E HRGs also have a specificity or reduction in variance for allocating appropriate grouping and complexity of activity, which is currently better than that of any other specialty.

Korner returns to the NHS of departmental and an anaesthetic specialist registrar or SHO at the same time. Several of the sites will also be modernising the hard work that will be necessary by the selected sites and the Casemix Office to deliver this refinement of our casemix measure. We owe them a debt of gratitude, especially when several of the sites will also be modernising their departments at the same time.

NIGEL BRAYLE
Accident and Emergency Department,
Golchester General Hospital,
Tunbridge Wells–Colchester,
Essex CO4 5JL

CHERYL DAY
Project Manager,
NHS Information Authority (Casemix Programme)

JONATHAN MARROW
Arrow Park Hospital,
Wiral, Merseyside

JANET PORTER
Chairman,
Clinical Services Committee (BAEM)

Prospective survey to verify the Ottawa ankle rules

EDITOR,—In their study to verify the Ottawa ankle rules Perry et al. point out “the potential dangers of rigid adherence to decision rules”. The study discovered that four malleolar fractures would have been missed had the guidelines (per the Ottawa ankle rules) been applied—that is, these patients would not have had radiography.

The data from the study were derived from the emergency department ankle “stamper”, which comprises 12 parameters. Of these they selected four: age, posterior malleolar tenderness (which malleolus was not specified), inability to weight bear immediately, and inability to weight bear in the emergency department. This information was deemed adequate to meet the study’s requirements. However, age is relevant only as an eligibility criterion for application of the rules—it does not impact on decision making regarding radiography thereafter. Secondly, the failure to specify which malleolus was tender detracts from attempts at verification—the rules specify both malleoli must be assessed.

Moreover, the study (and the stamper!) ignores the second part of the ankle rules entirely—that is, navicular zone and fifth metatarsal zone tenderness.
In view of the authors’ decision to apply only part of the Ottawa ankle rules, and the disregard for one of the malleoli, it seems inappropriate to conclude that “although useful, decision rules should be used with care and cannot replace clinical judgment and experience”.

BRENDAN McCANN
Specialist Registrar, Accident and Emergency Department, Royal University Hospital, Percust Street, Liverpool L7 8XP


Dr Perry replies

Thank you very much for giving me the opportunity to reply to Dr McCann’s letter. I disagree with Dr McCann’s comments about age. The Ottawa ankle rules clearly state that plain radiography is indicated if the patient is aged 55 years or greater.

The authors accept that our stamper did not specify which malleolus had been examined and may, theoretically, have resulted in some patients being recorded as “Ottawa negative” inappropriately. However, it is clearly stated in the discussion that the four missed fracture patients had their case notes reviewed and there were no apparent reasons why these fractures were not identified. This included ensuring adequate documentation of the clinical examinations.

It was never the intention to study the second rule concerning foot radiography and patients with bony tenderness of the foot, therefore, excluded.

Since we published the paper a number of changes have occurred at our hospital which reflect changes occurring in many hospitals in the NHS: the number of acute orthopaedic beds on the hospital site fell from 75 to 60; the number of acute admissions, particularly medical, has continued to rise; and improved resources and initiatives for managing emergency admissions have suffered at the expense of initiatives for reducing waiting lists.

In January 1999 we reviewed the length of stay in the accident and emergency (A&E) department for 25 consecutive patients over 65 years of age who were admitted with a proximal femoral fracture and compared them with figures for patients who were fast tracked in our original paper (fig 1). Although the 1995 figures were for patients who were fast tracked, the mean time for patients who could not be admitted because of the unavailability of an orthopaedic bed had still been only 4 hours and 8 minutes. The average length of stay has risen sharply with 40% of patients now staying in the A&E department for more than seven hours.

This apparent breakdown of a quality improvement initiative is an example of how emergency patients are suffering because of reduced numbers of acute hospital beds and a reduction in resources available for acute cases. In 1998 there were 812 cases of proximal femural fracture over the age of 65 years admitted to our hospital. We advocate the availability of three dedicated beds each day for the management of patients with a proximal femoral fracture.

The predictability of numbers and almost uniformity of presentation makes a fast track system for this type of injury eminently suitable. It is important, however, that hospital management work alongside clinicians in providing the necessary resources to develop a fast track service for this vulnerable group of patients.

The authors reply

We thank Mr Southward for his comments on our paper. Comprehensive data on CS incapacitant spray are lacking, particularly with regard to the more concentrated solution in use by UK police forces.

Mr Southward reminds us that serious symptoms are more likely with excessive or prolonged exposure and are generally mitigated by the victim being removed to a well ventilated area. We recommended irrigation of the eyes for severe symptoms as well as suggesting some general measures for decontamination and the treatment of cardiorespiratory complications.

Mr Southward recommends that particular attention be given to areas of the body where air flow may not occur and we are grateful to him for providing this additional advice.

CS incapacitant spray

EDITOR.—In 1996, CS incapacitant spray was sanctioned for the use of police forces in England and Wales. As its use increases the demands on accident and emergency departments from individuals who have been exposed to this will also increase. Some of the points in Worthington and Nee’s review are worth clarifying.

The experimental work into the safety of CS was performed on pyrotechnically generated CS. The spray used by the police produces a mist that contains CS as a supersaturated solution or as a fine powder. The solution in the spray is a 5% w/v solution dissolved in methyl isobutylketone (MIBK). The American forces use a 1% solution.

Pulmonary oedema after CS exposure has been reported, but only in conditions where the victim has been unable to escape, and is trapped in a confined area—that is, in exposure to very high concentrations. Equally burns to skin occur in specific conditions: high temperature, humidity, high concentrations, and prolonged exposure.

As mentioned at the outset these experiments were conducted on CS produced by a different method and it is difficult to extrapolate the results to a totally different type of exposure. The solvent, MIBK, has a low volatility, therefore in areas protected from air currents (behind ears, in skinfolds, under clothing bands, etc) it may not evaporate, prolonging the contact in warm moist areas. MIBK, itself, also has the potential to cause inflammation, dermatitis, and burns to the skin.

Although the standard advice regarding management of CS exposure is to remove the subject from the source and allow a flow of fresh air over the affected parts, if symptoms are persistent irrigation and bathing are required, as skin irritation may not be caused by CS but by MIBK.

R D SOUTHWARD
Specialist Registrar in Accident and Emergency, Sunderland Royal Hospital, Keir Road, Sunderland SR4 7TP


The authors


Figure 1. Length of stay in the A&E department for patients admitted with a proximal femoral fracture.
A rare cause of acute confusional state

Editor,—A 42 year old man presented after applying to eradicate wasp's nest in his attic with Rentokil wasp killer spray containing carbaryl 5%. The area was enclosed without windows. He was aware of the potential for toxicity and wore a cotton homemade mask. He sustained two wasp stings as he sprayed and his wife reported him staggering into the living room about 20 minutes later. Shortly after this he lost consciousness.

On arrival he was acutely confused and combative. Both conjunctivae were injected. He was haemodynamically stable with oxygen saturations >94%. He was difficult to manage because of his aggression and agitation. Short term memory was severely impaired. Oxygen and 5 mg intravenous diazepam were given immediately. There was no history of allergies and no local reaction to the two wasp stings. We gave atropine 600 μg and used intravenous diazepam to control the agitation. The patient was monitored and gradually improved.

Carbaryl can produce a host of signs and symptoms:

Mild—nausea and vomiting, diarrhoea, and tachycardias.
Moderate—confusion, sweating, salivating, incontinence, tremor, twitching, constricted pupils.
Severe—convulsions, coma, respiratory depression, cardiopulmonary arrest.

The acute confusional state, transient loss of consciousness, hypotension (recorded by paramedics on arrival), sinus tachycardia, and lacrimation seen in this man after spraying wasp killer in an enclosed, poorly ventilated area are typical of cholinergic hyperstimulation. This problem is more commonly reported with the use of agricultural pesticides containing organophosphates. Written on the bottle of the spray used is a warning not to use in enclosed, confined spaces.

BELINDA BREWER
Specialist Registrar, South Thames

CD-ROM REVIEWS

Abdominal Ultrasound: Principles and Techniques. CD-ROM written by Mark Deutchman, Associate Professor of Family Medicine, University of Colorado, Denver. Published by SilverPlatter Education Inc, Newton, Massachusetts, 1997. ISBN 1-57276-051-1. Hardware requirements: Multimedia PC with Microsoft Windows (8 MB RAM) or Windows 95 (16 MB RAM) or Macintosh (System 7.0 or later with 8 MB RAM). Details available from: SilverPlatter Education Inc. 246 Walnut Street, Suite 302, Newton, MA 02460-1639, USA (tel: +1 800 521 0574/+1 617 244 0284).

Installation of the software is simple. Within minutes the novice is introduced to the basic physics and practicalities of sonographic imaging. Each organ of the abdominal cavity is anatomically oriented via a 3D animated model or corona longum computed tomographic videographic image, relevant acoustic windows and shadows are highlighted, and normal ultrasonic images are emphasised. Representative images of common abnormalities, such as organomegaly, cysts, tumours, ascites and calculi, are presented via real time video images and multiple still images. Practical skills such as frame selection and organ measurement are emphasised and assessed. Cross reference icons allow for rapid updates to unfamiliar terms and principles, both within the text or via the world wide web.

This CD-ROM costs US$175 for individual use and US$495 for institutional use (plus shipping costs outside the US). While the educational content and the graphical quality are impressive, this CD-ROM needs more emergency case studies, particularly traumatic cases, for it to be of clinical and financial value in an accident and emergency department.

THOMAS CARRIGAN
Specialist Registrar in Accident and Emergency, Leeds

Although the Oxford Clinical Mentor is an innovative way of providing access to medical information its clinical content is more suitable for use in general practice than A&E. A similar system more orientated to the clinical problems of A&E medicine would be a welcome addition to a department's resources. While the Oxford Clinical Handbooks are a valued part of most departmental libraries, I would not recommend the purchase of this electronic version for use on A&E computer systems.

GRAHAM JOHNSON
Consultant in Accident and Emergency Medicine, Leeds

Modern Management of Acute Medical Emergencies


Critical Care, Trauma, and Emergency Medicine, 38th Annual Symposium

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British Association for Accident and Emergency Medicine 2000

4–7 April 2000, Churchill College, Cambridge. Further details: Conference Contact, 42 Devonshire Road, Cambridge CB1 2BL (tel: 01223 323437, fax: 01223 460396, e-mail: cc@concomm.demon.co.uk).