

## Journal scan

Edited by Jonathan Wyatt; this scan coordinated by Lee Wallis

### Clinically significant blunt cardiac trauma: role of serum troponin levels combined with electrocardiographic findings

A Salim, G C Velmahos, A Jindal, *et al*

*J Trauma* 2001;50:237-43

**Aim**—The authors attempted to answer three questions. Firstly, which trauma patients are at risk of significant blunt cardiac trauma (BCT); secondly, what is the value of the electrocardiogram (ECG) and cardiac troponin I (cTnI) measurement in determining significant BCT; and finally, how long do patients at risk of significant BCT have to be monitored for?

**Methods**—Prospective study of all blunt trauma victims with any risk of BCT admitted to a level 1 trauma centre in the USA over a 10 month period. Patients were said to be at risk of BCT if they had: rib fractures; sternal fracture; pneumothorax; haemothorax; thoracic seat belt sign, or pulmonary contusion. They were managed in a standardised manner by the in house surgeons, and all were investigated with ECG (0 and 8 hours), cTnI (0 and 4 hours) and chest radiography. Patients were analysed according to the presence or absence of significant BCT. Significant BCT was defined as the presence after trauma of: cardiogenic shock requiring inotropes; arrhythmias requiring treatment; structural cardiac abnormalities, or unexplained hypotension requiring vasopressors.

**Results**—115 patients were enrolled, of whom 19 (16.5%) had significant BCT. Eighteen of these became evident within the first 24 hours (one had a haemopericardium detected at day six). ECG abnormalities were detected in 58 (50%), and cTnI was increased in 27 (24%). All ECG abnormalities and 22 of the 27 patients with increased cTnI were apparent on arrival, the other five patients having increased cTnI within four hours (all five had an abnormal initial ECG). The combination of both tests gave a positive predictive value of 62% (both tests abnormal), and a negative predictive value of 100% (both tests normal). Six risk factors were identified as being independently associated with significant BCT: abnormal ECG (adjusted relative risk (ARR) of 14.0); abnormal cTnI (ARR 5.8); spinal injury (ARR 8.8); pre-existing cardiac disease (ARR 6.0); chest abbreviated injury score >2 (ARR 7.1), and head injury (ARR 4.5). Only seven of the 19 patients with significant BCT had abnormalities identified on echocardiography.

**Discussion**—The authors discuss the difficulties in defining significant BCT and argue that

it is the clinical problem resulting from injury which is important, not the presence of ECG or other investigation abnormality. They therefore defined significant BCT according to the clinical sequelae of the injury. The results were used to produce a treatment algorithm for patients with BCT. According to this algorithm, patients with abnormalities of both ECG and cTnI are admitted to intensive care, whereas patients with a normal ECG, but abnormal cTnI (or vice versa) are admitted to a monitored area and undergo echocardiography (although it is acknowledged that this has a limited role). The authors conclude that if both the ECG and cTnI are normal, then the patient can be safely discharged from the point of view of complications of cardiac injury.

**Critique**—The paper is well written and reports a high quality prospective study. The problems with identifying a gold standard against which to test ECGs and cTnI are addressed by the development of a new clinical definition based on the presence of cardiovascular problems as a result of the injury. The use of two relatively simple tests to exclude the likelihood of the development of significant cardiac problems is quite attractive and could well find a role to help to identify those patients who can be safely discharged after BCT. However, the numbers in the study were relatively small and it would therefore seem to be reasonable to await further evidence before promoting the algorithm as standard practice. Furthermore, given that all patients who had both an abnormal ECG and cTnI were admitted to intensive care for the treatment of other injuries, it is questionable how useful this information is.

### Study of community acquired pneumonia aetiology (SCAPA) in adults admitted to hospital: implications for management guidelines

W S Lim, J T Macfarlane, T C J Boswell, *et al*

*Thorax* 2001;56:296-301

**Aim**—The last review of community acquired pneumonia (CAP) in the UK was 20 years ago and since then, many new organisms have been identified. The authors set out to identify the organisms currently causing CAP in adults admitted to hospital.

**Methods**—A prospective study of adults (aged 16 years and over) admitted to one hospital over a 12 month period. Standard microbiological tests (sputum, blood, urine) were used to identify causative organisms. Admission criteria

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were: features of a lower respiratory tract infection (defined by the authors), new radiological findings consistent with infection on admission, treatment with antibiotics by the admitting doctor. Exclusion criteria were given as: other cause for admission, expected terminal event, infection distal to bronchial obstruction, and patients with TB, HIV, immunocompromise, or previously admitted into the study. An experienced radiologist who was blinded to the clinical details reported the radiographs.

**Results**—309 patients were admitted with CAP in the study period: 267 agreed and fulfilled the entry criteria. Some 199 of these had aetiological agents identified. There were many coinfections, with 60 (47%) of the pneumococcal infections having coinfection with another agent. The commonest identified organisms were: *Streptococcus pneumoniae* 129, influenza A virus 50, *Chlamydia pneumoniae* 35, *Haemophilus influenzae* 20, *Mycoplasma pneumoniae* 9, *Legionella pneumophila* 9. Only one case of penicillin resistant pneumococcus was found. Thirty day mortality was 15% (40 patients).

**Discussion**—The authors were pleased with their high pathogen detection rate (75%). They concluded that there was no evidence for a substantial shift in the causative organisms in CAP since previous studies. They emphasised the continuing need to administer antibiotics effective against *S pneumoniae*. The high infection rate with *Chlamydia pneumoniae* has not been previously demonstrated in large studies, but this was attributed to new diagnostic methodology. *Chlamydia pneumoniae* is usually found as a co-pathogen, and can lead to severe infection: hence the authors' recommendation that an antibiotic effective against atypical agents should be included in initial treatment in severe CAP. In non-severe CAP in the under 75 year age group, the use of an antibiotic to cover atypical agents was recommended in addition to standard antibiotic treatment. This was not considered to be necessary in the over 75 year olds, where atypical agents were less common, and were not associated with any fatalities.

**Critique**—This was a well conducted study from a respected group. It yielded some important data on the aetiological agents responsible for CAP requiring hospital admission. The findings are reassuring in that the recommendations made on the basis of the results seem to reflect current practice in most UK hospitals. It should be noted that the study only investigated those patients who were admitted to hospital and not those who attended accident and emergency and were discharged with treatment on an outpatient basis—it is possible that the aetiological agents responsible for CAP in this group is different. Similarly, the data were collected from a single hospital, which may not be representative of all other centres.

#### **The incidence of simultaneous fractures of the scaphoid and radial head**

C J Wildin, B Bhowal, J J Dias

*J Hand Surg [Br]* 2001;26B:25–7

The authors comment that previous studies show the incidence of associated injuries with

scaphoid fractures to be 5%–10%. In particular, for example, approximately 2% of scaphoid fractures are believed to be associated with distal radial fractures. This study looked at the incidence of associated radial head fractures in patients with scaphoid fractures. The authors prospectively followed up 178 patients with 181 scaphoid fractures who presented over a two year period. Of these, 11 (6%) had radial head fractures: four of these 11 had their scaphoid fractures diagnosed late (by up to three months). Patients with both scaphoid and radial head fractures were said to have often sustained higher energy transfer injuries.

**Comment**—A variety of different injuries may follow a fall onto the outstretched hand. This study is a useful reminder of the importance of complete examination and in particular, to consider the possibility of more than one injury. It is notable that in this series, overall, 14% of the scaphoid fractures were diagnosed late—it would be interesting to see how this compares with other centres.

#### **Can myocardial infarction be rapidly identified in emergency department patients who have left bundle branch block?**

M C Kontos, R H McQueen, R L Jesse, *et al*  
*Ann Emerg Med* 2001;37:431–8

This paper investigated an area that has been much debated in recent years. The risks associated with acute myocardial infarction (AMI) and the difficulties of early diagnosis in patients presenting with chest pain and left bundle branch block (LBBB) are well recognised. Previous studies suggest that, in patients with chest pain and LBBB, a significant proportion will have AMI. It is therefore highly desirable to have a system for recognising AMI from other causes of chest pain in these patients. The authors undertook a literature review, followed by a prospective study. From June 1994 to February 2000, 7725 patients attended the authors' department and underwent further evaluation for suspected ischaemia: 182 (2.4%) had LBBB on their initial ECG. Of these, 24 (13%) had AMI retrospectively diagnosed. Only 11 of these met one or more of the Sgarbossa criteria: the presence of concordant ST depression or elevation (>1 mm) was found to be 100% specific for AMI, but only 8%–17% sensitive. The authors conclude that there are no reliable ECG criteria for diagnosing AMI in LBBB. They argue that clinical information adds little (only 29% of those with LBBB and AMI were initially felt to be "high risk" on clinical information). Mindful of studies that show a slight reduction in overall mortality achieved by thrombolysing all patients with suspected AMI and LBBB, they await the development of biochemical markers to help with the early diagnosis.

**Comment**—A policy of administering thrombolysis to all patients with LBBB and suspected AMI seems unsatisfactory, but it does seem to be evidence based at the moment, and should be followed until further evidence comes to light. Although advocated by some, it is questionable

as to whether or not this approach will find many supporters in the UK.<sup>1</sup>

1 Shepherd M, Hardern R. Acute myocardial infarction in patients with left bundle branch block. [Letter]. *J Accid Emerg Med* 2000;17:74.

### Does advanced airway management in the field by paramedics improve patient outcome? A review of the literature

A-M Kelly

*Pre-hospital Immediate Care* 2001;5:16–18

A search of the Medline, CINAHL and Cochrane databases was undertaken for papers looking at outcomes from paramedic airway intervention. Almost all of the studies found were retrospective in nature, with only one non-randomised prospective trial and one controlled trial involving children. There were no papers on outcomes from the use of laryngeal mask airways. Other papers were broken down into the use of surgical airways and tracheal intubation. The evidence regarding tracheal intubation in cardiac arrest does not demonstrate any improvement in outcome if defibrillation is unsuccessful. However, there may be some benefit if spontaneous circulation is restored, although the evidence is weak. Tracheal intubation seems to be of benefit in patients with isolated head injury, but again, the evidence is weak. The authors found good evidence that paramedics are capable of safely and effectively intubating patients. Studies are quoted that show that the rate of successful intubation increases from 70% to over 90% if succinylcholine is available, but there is no increase in success with the use of sedatives. This information could be used to support changes in paramedic training and treatment protocols. As far as obtaining surgical airway is concerned, the evidence suggests that paramedics can perform cricothyroidotomy safely and effectively, but it remains of unproven value in terms of patient outcome.

*Comment*—This is a useful review of the role of certain advanced skills that often add to the prehospital time for a small but significant proportion of critically ill patients. Although it seems that paramedics are capable of undertaking some procedures, there remains considerable doubt as to their usefulness.

### Diagnosis of rotator cuff tears

G A C Murrell, J R Walton

*Lancet* 2001;357:769–70

This research letter looked at 400 patients with shoulder injuries “requiring” arthroscopy in two separate studies. The first study aimed to discover if any of the 23 commonly used clinical tests (not listed) were predictive for rotator cuff injury. The first 100 arthroscopically diagnosed rotator cuff tears formed one group, and the first 100 patients with no tears formed the second set. Three clinical tests were more positive in the tear group ( $p < 0.0001$ ): supraspinatus weakness, weakness in external rotation, and impingement (in internal and/or external rotation). The second study looked at all 200 tear and 200 no-tear patients, in order to try to establish the prevalence of tears in 10 year age groups. The results demonstrated a linear increase with age.

The authors concluded that the presence of all three clinical signs (above), or two signs in a patient over 60 years of age, gives a 98% probability of a rotator cuff tear. The absence of all three signs (in any age) gives only a 5% probability, which therefore, for practical purposes, effectively rules out the diagnosis.

*Comment*—It would be nice to see a more complete version of this paper, as it is difficult to comment on methodology on this relatively short research letter. Having said this, the findings and conclusions seem to be valid and therefore could be incorporated into clinical practice.

### The use of hypertonic saline in the treatment of traumatic brain injury

J A Doyle, D P Davis, D B Hoyt

*J Trauma* 2001;50:367–83

This paper reviewed the evidence regarding the use of intravenous hypertonic saline (HTS) in the treatment of patients with traumatic brain injury. A large number of studies of HTS were reviewed, looking at its effect upon intracranial pressure, together with its haemodynamic, vasoregulatory, immunomodulatory and neurochemical effects. The authors believe that evidence from animal studies suggest that HTS has a favourable effect on intracranial pressure and cerebral blood flow. They also present evidence that HTS can be used to control intracranial pressure in humans, although methodological differences makes the available evidence regarding HTS in resuscitation difficult to interpret. Potential adverse effects of HTS are discussed, including demyelination, acute renal insufficiency and haematological abnormalities. The studies quoted reported very low overall rate of complications from the treatment. The authors conclude that there is good evidence to support the controlled use of HTS in intracranial pressure management on neurosurgical units. However, they are unable to offer firm guidance on its use in resuscitation of the brain injured patient.

*Comment*—As often seems to be the case in reviews of this sort, the main recommendation is for further well designed studies, paying particular attention to dosage regimens. This is rather disappointing, given the large amount of time and effort that has already been spent upon research in this area.

### Paediatric pre-hospital care: postal survey of paramedic training managers

P Gaffney, G Johnson

*Arch Dis Child* 2001;84:82–3

The authors undertook a postal survey of the paramedic training managers of all UK NHS ambulance trusts, with two aims. The first was to identify the provision of paediatric equipment on frontline emergency ambulances; the second, to determine the level of training received by paramedics in the management of paediatric emergencies. There was a good response rate, but the results were rather worrying, if perhaps not too surprising. Of the 41 trusts (93%) that replied, none provided all of the equipment that the authors considered appropriate. Regarding specific items, 29%

carried paediatric tracheal tubes, 32% oral airways and 29% intraosseous needles. These figures are broadly representative of a longer list of equipment, with a consistent trend for less equipment to be carried for neonates than infants or older children. As far as the length of paediatric training for paramedics was concerned, the average was 5.7 hours (range 0–40 hours) during initial training. Annual refresher training was provided by 44% of trusts, with an average length of 1.7 hours.

*Comment*—Despite criticisms that could be levelled at the study, the results do reveal inadequacies and provide a useful baseline on which to try to improve. As the authors acknowledge, the increased emphasis on paediatric training in the new paramedic syllabus should go some way towards correcting the lack of training, but this will be of limited value on ambulances not carrying basic paediatric equipment! As a comparison, it would be interesting to ascertain what level of paediatric training doctors who respond to prehospital emergencies (“BASICS doctors”) in the UK have undertaken, and what equipment they carry.

**Anxiety reaction in children during removal of their plaster cast with a saw**

K Katz, R Fogelman, J Attias, *et al*  
*J Bone Joint Surg Br* 2001;**83B**:388–90

The authors report the death of an 18 month old child during the removal of a plaster of Paris. The child suffered from cardiomyopathy—it was postulated that anxiety, induced by the electric plaster saw, triggered an arrhythmia. To investigate this further, they undertook a prospective study of 20 children (without heart problems), aged 5–6 years, who required above elbow plaster immobilisation of forearm fractures. At removal of the plaster, 10 children were provided with hearing protection and 10 were not. Noise levels were recorded throughout the procedure, as was heart rate. The plaster saw generated noise levels up to 114 dBA without hearing protection, and 88 dBA inside the ear muffs. Mean heart rate was recorded before, during and after the procedure, with a mean increase of 11.1 beats per minute in the hearing protected group, compared with 26.9 in those without ear muffs ( $p < 0.001$ ). The authors suggest that children with cardiac abnormalities should have their plasters removed without a saw (assuming that they have been identified initially). To facilitate this they recommend placing a groove in the cast when it is applied. They also advocate the use of ear protection for all children where an electric saw is being used to remove a plaster.