Journal scan

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Is it possible to exclude a diagnosis of myocardial damage within six hours of admission to an emergency department? Diagnostic cohort study ▶ *Background:* Patients with chest pain commonly present to emergency departments. In the UK, 30% of such patients are admitted to hospital for further investigation, and of those discharged around 6% may have significant myocardial damage. The authors set out to compare a six hour diagnostic protocol, which could reduce unnecessary admissions, against a gold standard test.

Method: Consecutive patients aged over 25 years with less than 12 hours of unexplained chest pain were included. Exclusion criteria were electrocardiographic (ECG) evidence of infarction or ischaemia, hypotension, arrhythmia or the need for admission on other medical or social grounds. The subjects underwent serial creatinine kinase MB measurements and continuous 12 lead ST segment monitoring for six hours. Patients were admitted to hospital if they had a positive creatinine kinase MB or developed an "important" ST segment change, as determined by a clinician. The gold standard tests were troponin T measurement at 48 hours or serial ECGs and cardiac enzymes over 24 hours.

Results: Of 383 patients attending, 368 completed the protocol and 292 completed follow up with gold standard testing. Fifty three patients tested positive on the diagnostic protocol, 47 on CK-MB measurements and six on ST monitoring. Altogether 239 patients were protocol negative. Of these 239 patients, 238 were also gold standard negative. The single false negative patient had a marginally increased troponin T and at one month remained well with no ECG changes. The sensitivity of the test was 97.2% (95% CI 95.0% to 99.0%), the specificity 93.0% (90.0% to 96.0%).

Conclusions: The six hour protocol effectively ruled out myocardial damage in patients with low to moderate risk of infarction, permitting safe, early discharge. Continuous ST monitoring identified two patients with evolving infarction enabling early thrombolysis.

Comment: Given the ever increasing demands on the emergency health care system, there can be no doubt that the authors have tackled an important issue. The diagnostic protocol used relied upon continuous ST segment monitoring and certain cardiac enzyme assays, which may not be immediately available at other hospitals. This may affect the way in which these results can be applied elsewhere. Twenty per cent of patients did not undergo gold standard testing and the authors point out that, although this is not ideal, it was unavoidable because of the "highly mobile and diverse" nature of their local population. This also raises the question of whether the population studied was representative of that in other areas of the UK—a brief table of patient data may have helped to clarify this. Despite these reservations, the authors present a convincing case for more widespread adoption of a strategy aimed to enable "early" discharge of relatively large number of patients presenting to hospital with chest pain.

▲ Herren KR, Mackway-Jones K, Richards CR, *et al.* *BMJ* 2001;323:1-4.

Effects of clopidogrel in addition to aspirin in patients with acute coronary syndromes without ST-segment elevation

▶ The use of aspirin and heparin is known to reduce the risk of death and myocardial infarction in patients with acute coronary syndromes. Intravenous glycoprotein IIb/IIIa inhibitors reduce the risk of early events but, like heparin, they are not beneficial for

long term prophylaxis. The authors have investigated the use of aspirin with and without clopidogrel, which inhibits the adenosine diphosphate platelet aggregation pathway. They describe a randomised, double blind placebo controlled trial of 12 562 patients presenting to hospital within 24 hours of onset of symptoms, but without ST elevation. During most of the trial, patients were only included if there were electrocardiographic (ECG) changes or raised cardiac enzymes at presentation. Once randomised, further treatment was unrestricted and left to the discretion of the physician. The primary outcome was the composite of death from cardiovascular causes, stroke or non-fatal infarction. The rate of the primary outcome measure was lower in the clopidogrel group (relative risk 0.80; 95% CI 0.72 to 0.90), with a number needed to treat of 50 to prevent one episode. Major bleeding episodes were more common in the clopidogrel group (relative risk 1.38; 95% CI 1.13 to 1.67), but there was no significant difference in the rates of life threatening or fatal bleeding or haemorrhagic stroke. This large trial has shown some improvement in outcome by using clopidogrel in a select group of patients with non-ST elevation ECG changes or raised biochemical markers. Given that the clopidogrel group suffered significantly more major haemorrhagic complications, the potential for clopidogrel in other situations remains unclear. It is also unclear as to whether clopidogrel will prove to be more effective (or safer) than the glycoprotein IIb/IIIa inhibitors which block the final common pathway of platelet aggregation.

▲ The clopidogrel in unstable angina to prevent recurrent events trial investigators. *N Engl J Med* 2001;345:494-502.

A prospective multicentre study of cervical spine injury in children ▶ This prospective, observational trial of 3065 paediatric blunt trauma patients was designed to evaluate the effectiveness of the National Emergency X-Radiography Utilization Study (NEXUS) guidelines for cervical spine imaging¹ in a paediatric population.

All patients were assessed by a physician who decided whether radiographic imaging was necessary or not, and recorded the presence or absence of the NEXUS criteria (midline tenderness, altered conscious level, intoxication, neurological abnormality or distracting injury). Only 30 children were subsequently found to have a cervical spine injury and they were all positive for at least one of the NEXUS criteria. The sensitivity of the test (100%), however, has wide confidence intervals (95% CI 87.8% to 100%) because of the low number of children with injuries. Just four of the cervical spine injuries occurred in children less than 4 years. The authors estimate that proper validation of the NEXUS rules in children would require a study of 80 000 participants, so it is unlikely to ever happen. In the absence of this, it is probably reasonable to use these criteria in adolescents, but it is difficult to recommend them with any degree of certainty for younger children, because of the low incidence of injury, combined with inherent difficulties with communication and cooperation.

▲ Viccellio P, Simon H, Pressman BD, *et al* for the NEXUS group. *Pediatrics* 2001;108:e20.

▲ 1 Hoffman JR, Mower WR, Wolfson AB, *et al*, for the National Emergency X-Radiography Utilization Study. Validity of a set of clinical criteria to rule out injury to the cervical spine in patients with blunt trauma. *N Engl J Med* 2000;343:94-9.

A comparison of lorazepam, diazepam, and placebo for the treatment of out of hospital status epilepticus ▶ This paper adds some weight to the growing body of evidence supporting the use of intravenous lorazepam to terminate tonic-clonic seizures.

A total of 205 adults patients who had been fitting for more than five minutes (defined as "status epilepticus" by the authors) in the prehospital setting were randomised to receive blinded treatment with either intravenous lorazepam 2 mg, diazepam 5 mg or placebo from the attending paramedics. The dose was repeated if necessary. As expected, both benzodiazepines were significantly more likely to stop fitting than

placebo. There was a trend towards more success with lorazepam than diazepam, but this did not quite reach significance (OR 1.9; 95%CI 0.9 to 4.3). Prehospital complications were more common in those receiving placebo than in either treatment group. In this study, prehospital intravenous benzodiazepines were safe and had more patients been enrolled, it does seem to be likely that lorazepam would have proved superior.

▲ **Allredge BK**, Gelb AM, Isaacs SM, et al. *N Engl J Med* 2001;**345**:631–7.

Asthma severity and adequacy of management in accident and emergency departments in France: a prospective study

► This prospective observational study reports the treatment of 3772 patients with acute asthma in 37 centres across France. Severity was classified according to British Thoracic Society guidelines and the “adequacy” of treatment was assessed. High proportions of patients fell into the more severe categories (26% life threatening, 49% severe) and concerns were raised about the underuse of systemic corticosteroids in these patients, with 30%–40% of those who “should” have been treated according to the guidelines actually being untreated. It is interesting that the guidelines were not followed, despite the fact that the clinicians knew that they were being studied! Of course, simply because the guidelines were not followed does not automatically mean that patients suffered as a result—indeed, there is no evidence presented to suggest this. It is worth remembering, however, that there is good evidence that many patients who present to hospital with acute asthma do benefit from a short course of corticosteroids.¹

▲ **Salmeron S**, Liard R, Muir JF, et al. *Lancet* 2001;**358**:629–35.

▲ **1 Rowe BH**, Spooner C, Ducharme FM, et al. Early emergency department treatment of acute asthma with systemic corticosteroids. *Cochrane Database Syst Rev* 2000;**2**:CD 002178.

The child with a non-blanching rash: how likely is meningococcal disease? ► Non-blanching rash is a well publicised sign of meningococcal infection and as such, often causes parents to consult general practitioners or emergency departments. In many children the rash has another cause and the authors aimed to determine whether characteristics of the rash, other physical signs or laboratory tests could predict which children had meningococcal infection. This prospective observational study included 218 children presenting to a paediatric emergency department with petechiae or purpura and no clear alternative diagnosis (such as Henoch-Schönlein purpura or leukaemia). Not surprisingly, children with subsequently proven meningococcal disease (11% of those studied) were more likely to be ill with prolonged capillary refill time, hypotension and increased white cell counts. No child with a normal CRP or with a rash confined to a superior vena cava distribution had meningococcal disease. No other clinical findings or test had sufficient sensitivity to rule out meningococcal disease. The authors concluded that in an otherwise well child, limitation of the rash to the head and neck is suggestive of causes other than meningococcal disease. Unfortunately, however, while interesting, their findings do not offer an effective rule out strategy for meningococcal disease in children with a non-blanching rash.

▲ **Wells LC**, Smith JC, Weston VC, et al. *Arch Dis Child* 2001;**85**:218–22.

Efficacy of eye patching for traumatic corneal abrasions: a controlled clinical trial

► The authors of this study determined to challenge standard practice and to investigate whether there is a need to apply an eye patch to patients presenting to a large US emergency department. Altogether 163 patients with corneal abrasions were randomised to treatment with or without an eye patch. All received antibiotic ointment and were followed up at daily intervals until healing occurred. No formal sample size calculation was reported. The authors found no significant differences in healing or discomfort over the first three days after injury. They suggest that any effect missed would probably be insignificant and therefore recommend treatment without eye patches, in order to preserve binocular vision.

▲ **Le Sage N**, Verreault R, Rochette L. *Ann Emerg Med* 2001;**28**:129–34.

Paediatric minor head trauma; indications for CT scanning revisited

► There is wide variety in practice, both nationally and internationally, surrounding computed tomography (CT) of

children who have sustained apparently minor head injury. Although significant injuries in this group are believed to be rare, there are concerns about the impact of failing to diagnose them, partly because of the difficulty of clinical evaluation of young children. In this retrospective review of 429 children with Glasgow Coma Scale of 14 or 15 who were scanned after head injury with a “high risk” mechanism, 62 (14%) were found to have intracranial injury, although only three needed surgical intervention. History of loss of consciousness was not found to be predictive of intracranial injury. The authors suggest that CT should be used liberally in children with apparently minor head injury but with a “significant” mechanism. The review, however, fails to note the presence of headache, which may have helped to identify a higher risk group, and it suffers from selection bias. These data do not demonstrate that a policy of CT is more effective than a period of observation in these children. No doubt practice will still be largely guided by the resources available in individual departments, perhaps also with a slight concern (not prominent in this paper) regarding the amount of radiation exposure resulting from a brain CT scan.

▲ **Simon B**, Letourneau P, Vitorino E, McCall J. *J Trauma* 2001;**51**:231–8.

The non-invasive diagnosis of pulmonary embolism ► This editorial explores current dilemmas in the investigation of possible pulmonary embolism (PE). Although pulmonary angiography is recognised as the gold standard investigation for suspected PE, it is invasive and not widely used. Ventilation: perfusion (V/Q) scanning may be difficult to interpret if the chest radiograph is abnormal, and results given in terms of probabilities can be confusing to clinicians. Patient selection for imaging is important and, in those with low clinical risk, a negative D-dimer virtually excludes PE. Those with a positive D-dimer or higher clinical risk require further investigation and the authors suggest that if the chest radiograph is normal a V/Q scan will often give a definitive result. Admittedly, two of the authors are radiologists, but they make a good case for proceeding to spiral CT angiography in patients with abnormal chest radiograph, explaining that this will reliably detect emboli at the segmental level and may identify other causes of chest pain.

▲ **Dixon AK**, Coulten RAR, Peters AM. *BMJ* 2001;**323**:412–13.

Accidents and resulting injuries in premobile infants: data from the ALSPAC study

► In this large study, the mothers of 11 466 infants were questioned about any “accidents” their child had suffered up to 6 months of age in order to elucidate a “normal pattern of accidental injury”. Twenty two per cent of children had suffered a fall, usually from a bed or settee, but only 17% of these resulted in an injury. Just one child sustained a fracture (clavicle) after a fall from a bed or settee. Only 1.5% had suffered a burn or scald, most commonly from hot drinks. The authors state that children aged under 6 months are not mobile and that falls or burns in this group should raise the suspicion of non-accidental injury. Personal experience as a parent suggests that infants in their first 6 months can be far from immobile! In keeping with this, “accidents” were reported very commonly in this group, but injuries appeared to be infrequent, usually comprising trivial head injuries. This ambitious study takes an important step into difficult and previously uncharted territory. However, its limitations do need to be considered. These include both deliberate and non-deliberate under-reporting of potentially injurious events by parents.

▲ **Warrington SA**, Wright CM, ALSPAC Study Team. *Arch Dis Child* 2001;**85**:104–7.

Bedside tracer gas technique accurately predicts outcome in aspiration of spontaneous pneumothorax

► After aspiration of a pneumothorax it is common practice to base decisions about further drainage, admission to hospital or discharge on the basis of a repeat chest radiograph. In the 119 patients in this study, lung re-inflation on postaspiration radiograph was a poor predictor of success, with re-collapse requiring further intervention occurring in 34% by the following day. The authors postulated that evidence of a pleural leak may be a better predictor of success. They therefore asked patients to breathe air labelled with tracer gas during their aspiration and then used a flame ioniser to try to detect tracer in the aspirate. A negative tracer gas test predicted successful aspiration in 92% of cases, but in 67% of those with a

positive test there was early re-collapse. On the strength of their findings, the authors propose a policy of admitting tracer positive patients overnight and reviewing tracer negative patients at one week (rather than the next day). The authors are to be congratulated on identifying a problem and resolving it with a rather neat solution! They do not, however, present any evidence that patients came to harm by being discharged and reviewed the following day. This, combined with the rather cumbersome equipment needed (including a 150 litre Douglas bag), means that current practice seems unlikely to imminently change.

▲ **Kiely DG**, Ansari S, Davey WA, *et al.* *Thorax* 2001;**56**:617–21.

Bolus fibrinolytic therapy in acute myocardial infarction ►

Bolus thrombolytics offer ease of administration which may reduce door to needle times and facilitate prehospital thrombolysis. This review considered 38 papers reporting the outcomes of patients treated with bolus agents. Quite reasonably, the authors did not carry out a meta-analysis, because of the heterogeneity of agents

and regimens. They did, however, manage to conclude that outcomes are similar in patients treated with bolus agents compared with tPA infusion. They suggest that the excess rates of intracranial haemorrhage with bolus agents in some trials may be attributable to concomitant heparin administration, but argue that large trials are still needed to assess risks. This paper is scientifically unconvincing and on this basis it should not influence practice relating to in-hospital thrombolysis.

▲ **Llavadot J**, Giugliano RP, Antman EM. *JAMA* 2001;**286**:442–9.

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