patients with the same severity of illness treated by junior doctors and consultants.

Given these potential weaknesses, how then can the strength of evidence from observational research be weighted against other forms of inquiry? There is no doubt that for studying the effects of treatment, observational methods come second best to the randomised controlled trial. However, good observational research design can avoid bias and ensure that known confounders are adjusted for in the analysis. Some reference texts give check lists to aid the reader in determining the reliability of different types of study (table 6).

Summary

In this review we have described some uses of observational research, and some of its limitations. The examples given have shown that observational studies can be an ethical and practical method of inquiry. The major uses of observational research include determining the incidence and prevalence of disease, aspects of disease aetiology, the effect of exposure to known hazards, and the application of diagnostic tests in the clinical setting. Observational studies are most useful to the emergency physician for determining the performance of diagnostic strategies. As this is a specialty where clinicians have just a single diagnostic opportunity, high quality observational studies must continue to help develop evidence based emergency medicine.

We gratefully acknowledge the permission granted by D L Sackett (tables 4 and 6), R G Wilkinson (fig 2), and J H Abramson (fig 1) for the reproduction of their work, and that of their respective publishers: Little Brown and Co, BMJ Publishing Group, and Churchill Livingstone.

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Further reading

- Jaeschke R, Guyatt G, Sackett DL, for the Evidence Based Medicine Working Group. Users guide to the medical literature. III. How to use an article about a diagnostic test. A. Are the results of the study valid? JAMA 1994;271:389–91.
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Faculty of Accident and Emergency Medicine

Consultant appointments, September to December 1997

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Mr Paul Cornelius	Conquest Hospital, St Leonards on Sea
Dr K Henderson	Homerton Hospital
Mr Stephen Meek	Royal United Hospital, Bath
Dr M Mitchell	Hillingdon Hospital, Uxbridge
Mr Iomhar O'Sullivan	United Bristol Healthcare Trust
Mr V Reece	South Tyneside District Hospital
Mr M Saab	Fairfield General Hospital
Mr J D Whittaker	Sharoe Green Hospital
Mr J H Williams	Carmarthen and District NHS Trust

hard to identify for the complete (national) telephone questionnaire were not omitted.

RECOMMENDATIONS

This study shows there is a clear need for a draft document setting out appropriately constituted guidelines on pain management in the A&E department. These need to cover the "chain of analgesia," that is: the optimum drug, by the optimum route, by the optimum dose, to achieve the optimum effect. This correct order is essential for effective analgesia. While the results of the study are encouraging in that most SHOs seem to give an appropriate drug, they are less so with respect to the route of administration and dose. Only by considering all these aspect can we effect policies for optimal pain management.

Recently published articles outline recommendations on the development of protocols for pain management.[11-15] These include the following: extensive review of scientific reports, establishment of practice patterns, identification of problem areas, promotion of research, review of current protocols and development of new ones with respect to specific criteria (for example, sensitivity, specificity, reliability, reproducibility, clinical applicability, flexibility, and clarity), a multidisciplinary approach, implementation of guidelines with appropriate validation, extensive research with the publication of both positive and negative outcomes, and finally a review of policies so that they can be altered or abolished as necessary.

There is therefore much work to be done to ensure that accident and emergency patients receive optimum pain relief.

We acknowledge the assistance of S Morris, MRPharmS.

Appendix

Questionnaire for A&E SHOs

What analgesia would you use in the following scenarios?

(1a) A 23 year old female with a compound fracture of the tibia and fibula in severe pain:
- normal procedures practised
- 60 kg, no medical problems.

(1b) The above patient still in moderate to severe pain 20 minutes later.

(2) An 80 year old female with a fractured neck of femur with pain at rest:
- frail, pain at rest.
- 55 kg, no major medical problems.

(3) An 18 year old male with a sprained ankle in pain:
- sports injury, difficulty in bearing weight
- no underlying fractures
- insisting analgesia
- 70 kg, no major medical problems.

(4) A 45 year old male with severe abdominal pain:
- not colicky, abdomen rigid
- haemodynamically stable
- surgeons busy for 30 minutes
- 80 kg, no medical problems.

(5) A 60 year old male with an acute myocardial infarction in pain:
- haemodynamically stable
- 75 kg, no major medical problems

(6) A 2 year old female with 15% partial thickness burns in distress:
- no burns to face
- 12 kg, no medical problems
- Intravenous access attainable.

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Managing meningococcal disease: reducing mortality in children and adults

Monday 15 June 1998, Royal College of Physicians, London

This national conference, organised by the Meningitis Research Foundation, aims to bring together both paediatric and adult hospital doctors who are involved at all stages in the recognition and treatment of meningococcal disease and to provide a practical learning experience involving case studies, comparison of methods, problems and constraints in treating children, adolescents and adults.

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bodies, pedicles, and posterior elements to clear the cervicothoracic junction radiographically.[8]

In conclusion, our study shows that in patients for whom the standard three view series fails to demonstrate the cervicothoracic junction, swimmer's views and supine oblique views provide similar information with regard to the alignment of the vertebral bodies, but supine oblique films are more likely to demonstrate the posterior elements and their alignment. By avoiding the need to move patients, they are also safer and expose the patient to less radiation. They therefore constitute an invaluable additional view in trauma radiology.

We thank superintendent radiographer Lorna Turnbull for her invaluable assistance during this study, Dr David Gentle and Mr Ian Kennedy of the West of Scotland Health Boards Department of Clinical Physics and Bio-engineering for data on radiation exposure doses, and Miss Jackie Riley of Glasgow Caledonian University for statistical advice.

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First Asian Conference on Emergency Medicine,

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testinal flora (that is, the *B fragilis* group and enterobacteriaceae). Regimen used is either a single broad spectrum agent (for example, cefoxitin, an extended spectrum penicillin plus a β-lactamase inhibitor, or a carbapenem), or a combination of agents (for example, clindamycin or metronidazole plus an aminoglycoside, quinolone, or third generation cephalosporin).

I acknowledge the efforts of the clinical and laboratory staffs at the participating hospitals and the secretarial assistance of Joanie Pietrafitta.

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JOURNAL SCAN

Edited by James Wardrope, associate editor
This scan coordinated by Alison Smith

Is routine computed tomographic (CT) scanning necessary in suspected basal skull fractures?

Goh K Y C, Ahuja A, Walken S B, Poon W S
Injury 1997;28:353–7

Overview—The authors aimed to determine the yield of basal skull fractures detected by fine cut CT technique to assess the association between positive CT findings with clinical signs, and between basal skull fracture and other traumatic intracranial pathology.

Design and methods—In a prospective cohort study of 500 patients undergoing CT in a regional neurosurgical centre, 144 were initially identified clinically as having signs of basal skull fracture. The results of a fine cut (5 mm) base of skull CT scan and routine (10 mm cut) vault CT were compared to assess the association between clinical and CT findings. A neuroradiologist, blind to the clinical findings, then reviewed the CT for a clear fracture line crossing the skull base. Data on other intracranial pathology were also collected.

Results and analysis—144 patients (28.8%) were found to have clinical signs of basal skull fracture. The total number of basal skull fractures detected by fine cut CT was 97 (19.4%). Only 75 patients (52%) with positive clinical signs had positive CT findings. A further 22 patients with no clinical signs had positive CT evidence of basal skull fracture. The authors found the following clinical features were associated with positive CT: epistaxis, periorbital bruising, cranial nerve injury, Battle's sign, and ear bleeding ($p < 0.001$). It was also observed that 50.5% of patients with CT evidence of basal skull fracture had other associated intracranial mass lesions, of which 55.1% required neurosurgical intervention, compared with only 16.6% of those without CT evidence of basal skull fracture. Traumatic subarachnoid haemorrhage and increased mortality were also found in the patients with basal skull fracture.

Critique—The study did show an important association between basal skull fracture and intracranial mass lesions, of which half required neurosurgical intervention. The authors feel this evidence justifies the routine use of fine cut CT in all suspected base of skull fractures. However, their findings suggest that in suspected basal skull fracture a standard 10 mm cut vault scan would detect those lesions that require intervention, and that fine cut basal views add little to the management decisions.

The paper could have been improved by addressing the following issues:

(1) The aim was to assess the yield of fine cut CT in suspected basal skull fracture, but there is no real validation of this technique. In particular the authors cite two cases with negative scan results but positive clinical findings and explain these on the basis of a minute fracture missed in the plane of scanning. They make no attempt to determine the numbers of false negative CTs which, if significant, could change all the other conclusions.

(2) The study examined the performance of an investigation and the accuracy of clinical findings, yet no attempt was made to state the accuracy of the tests in terms of positive and negative predictive values. There is no explanation of how the statistics were compiled. The authors state that there was a significant relation between clinical signs and basal skull fracture on CT but on even cursory examination of the information as presented it is difficult to be sure that this is correct (for example, they claim a highly significant association between bleeding from the ear and base of skull fracture but in 37 patients with this symptom 18 had no fracture demonstrated and 19 had a fracture). Also 22.7% of those with basal skull fracture on CT had no clinical signs of such a fracture. The lack of detail and the presentation of the results makes it difficult to have confidence in the conclusions.

Overall this study does highlight the importance CT in patients with clinical signs of basal skull fracture: 47 of 144 such patients had positive findings on routine vault CT, and these patients had a increased need of operative treatment and a higher mortality. However, from the data available it is questionable if fine cut CT of the base of the skull will add anything to the management of these patients.

Emergency room triage of patients with acute chest pain by means of rapid testing for cardiac troponin T or troponin I

Hamm C W, Goldmann B U, Heeschen C, *et al*
New England Journal of Medicine 1997;337:1648–53

Overview—The evaluation of patients with chest pain and negative electrocardiograms (ECG) is time consuming and expensive. Recent studies have shown the measurement of heart specific contractile proteins troponin T (TT) and troponin I (TI) superior to conventional measurement of creatine kinase MB (CKMB) in detecting minor myocardial injury. The use of these measurements is currently inappropriate in the emergency room as they are not widely available and they take a long time to do. However, there is a newly available qualitative (positive or negative) test in which results are available in 15 to 20 minutes. This study assesses the diagnostic and prognostic value of the rapid test in early triage of chest pain patients in the emergency room.

Design—This was a prospective cohort study. All patients in the study group had rapid TT and TI testing in addition to ECG and CKMB. The group were followed up for 30 days to determine the incidence of cardiac events.

Patients—773 patients were recruited from 870 consecutive patients presenting to the emergency room of a university hospital with anterior/precordial/left sided chest pain of less than 12 hours' duration; 97 patients with ST elevation on ECG at presentation or with documentation of myocardial infarction within the preceding two weeks were excluded.

Methods—Troponin levels in addition to CKMB levels were measured at presentation and again at 6 hours after the onset of pain. ECG was assessed by the physicians in the emergency room and re-evaluated by an independent observer. All patients were followed until discharge from the hospital and for 30 days thereafter by telephone or questionnaire to record cardiac events.

Results and analysis—Complete data were obtained on 97.2% of patients; 63% were admitted to hospital and 6% were diagnosed subsequently as having had a myocardial infarction on the basis of CKMB results. TT was

positive for 94% myocardial infarctions, TI for 100%. The negative predictive value for cardiac events in the next 30 days was 98.8% for TT and 99.7% for TI. The one patient with negative TI and subsequent cardiac event had an abnormal ECG.

Conclusion and extrapolation—The rapid qualitative tests for TT and TI are reliable in the diagnosis of myocardial infarction in the absence of diagnostic ECG changes. Of equal importance, they help predict the risk of cardiac events in the next 30 days, allowing discharge of appropriate patients from the emergency room.

Critique—This is a key study of assessment of cardiac risk in patients presenting with chest pain. In general it was both well executed and well reported. The study compared results obtained for TT, TI, and CKMB in myocardial infarction and other cardiac events. It did not compare the troponin tests directly with CKMB results for statistical sensitivity, specificity, or positive and negative predictive values. Without this analysis, the overall impression seems to be that TT and TI are slightly better than CKMB at predicting myocardial infarction but much better at predicting those patients at very low risk of a cardiac event, who can therefore be allowed home. However, the TT result was made available to the emergency room physician and all those with positive results were admitted. The authors admit that this may have led to a lower out-of-hospital event rate than with conventional decision making. Overall it seems the availability of the rapid TT and TI test in the emergency room could allow safe discharge with a considerable saving of bed-days for any reasonable sized hospital.

Effect of fever on capillary refill time

Gorelick M H, Shaw K N, Murphy K O, Baker D
Pediatric Emergency Care 1997;13:305–7

This paper reassures us that fever (deep body temperature > 38.5°C) does not affect capillary refill time as a measurement of dehydration in medically sick children. Eighty children with carefully defined dehydration were studied. Capillary refill has a specificity of 0.94 and a sensitivity of 0.44.

Radiographically occult scaphoid fractures: value of MR imaging in detection

Breitenseher MD, Metz VM, Gilula LA, Gaebler C, Kukla C, Fleischmann D, Imhof H, Trattnig S
Radiology 1997;203:245–50

Magnetic resonance imaging (MRI) was performed within one week of injury in 42 patients with *x* ray negative, clinically positive scaphoid fractures. MRI at one week identified all 20 fractures (including other carpal bones) and significant ligamentous injuries, compared with follow up *x* rays which identified half at two weeks, three quarters at four weeks, and all at six weeks. This study supports several others in advocating MRI. An appropriately timed five minute scan could offer advantages both in reducing patient inconvenience and reducing the greater economic considerations of prolonged immobilisation and recurrent hospital attendances.

Outcome of survivors of accidental deep hypothermia and circulatory arrest treated with extracorporeal blood warming

Walpoth B H, Walpoth-Aslan B N, Mattle H P, Radanov B P, Schroth G, Schaeffler L, Fischer A P, von Segesser L, Althaus U
New England Journal of Medicine 1997;337:1500–5

This study evaluated the long term outcome—with emphasis on neurological function—of 15 survivors of accidental deep hypothermia with circulatory arrest who had been rewarmed with cardiopulmonary bypass. They found that neurological deficits noted early in recovery resolved completely in 14 patients and functionally resolved in the final patient.

Reliability of fat-pad sign in radial head/neck fractures of the elbow

Irshad F, Shaw N J, Gregory R J H
Injury 1997;28:433–5

This prospective study looked at 193 patients with elbow injury. The *x* rays were assessed for the presence of a positive anterior fat pad sign. Analysis of their results shows the presence of a positive anterior fat pad was 85% sensitive for radial head/neck fracture but only 50% specific for the presence of any elbow fracture. However, the absence of an anterior fat pad is a more reliable indicator that no radial head/neck fracture is present.

Value of assessment of pretest probability of deep-vein thrombosis in clinical management

Wells P S, Anderson D R, Bormanis J, Guy F, Mitchell M, Gray L, Clement C, Robinson K S, Lewandowski B
Lancet 1997;350:1795–8

This study examined 593 outpatients with suspected deep vein thrombosis. They were stratified according to clinical guidelines in terms of risk for deep vein thrombosis, and this determined the subsequent level of investigation. Deep vein thrombosis was detected in 16% of patients, and only 0.6% of those with initially negative tests went on to have subsequent thromboembolic events. Overall only 5.6% of patients required venography and 28% required serial ultrasound testing.

Covert video recordings of life-threatening child abuse: lessons for child protection

Southall D P, Plunkett M C B, Banks M W, Falkov A F, Samuels M P
Pediatrics 1997;100:735–60

The study describes the use of covert video surveillance in 39 children in whom apparent life threatening events (ALTE) were suspicious of induced illness. The covert video surveillance confirmed life threatening child abuse, mainly attempted suffocation, in 33 of the 39 children. Factors associated with life threatening child abuse presenting as ALTE were an older age at initial presentation (3.6 *v* 0.3 months), blood around the nose or mouth, suspected or actual history of abuse in siblings, SIDS in a sibling, and episodes deliberate self harm or recurrent medical attendances of the parents.

Cambridge accident and emergency team wins BUPA communication award

Dr Sue Robinson from the accident and emergency department at Addenbrooke's Hospital received the award for excellence in communication between health care professionals and patients at an awards ceremony in London on the 12 November 1997. This award is given by the BUPA Foundation in association with the Academy of Medical Royal Colleges and the Patients Association. Presenting the award is Sir Michael Peckham, Chairman of the BUPA Foundation.

Dr Robinson and her colleagues at Addenbrooke's also received a cheque for £10 000 for their initiative, which offered relatives the option of remaining in the resuscitation room with patients undergoing resuscitation for major trauma or cardiac arrest.

Pictured: (left to right) Dr Gregor Campbell-Hewson, specialist registrar in emergency medicine, Dr Sue Robinson, consultant in emergency medicine, Sir Michael Peckham, and Mr David Williams, Past President, Faculty of Accident & Emergency Medicine.

Further information is available from Alison Bone or Alan Rustad, BUPA Public Relations, Tel (0)171 656 2091/ 2086.