Time of onset of hypothyroidism related to presentation with polymyalgia rheumatica or giant cell arteritis

	No of patients	No with hypothyroidism	Time of onset of hypothyroidism: Before or at presentation	Time of onset of hypothyroidism: After presentation
Giant cell arteritis	20	6	3	3
Polymyalgia rheumatica	16	9	7	2

patients tested were hypothyroid. The table shows the time of onset of the hypothyroidism; in five patients it developed during follow up, after six months to 10 years.

There was no significant difference in mean age, erythrocyte sedimentation rate, haemoglobin concentration, or platelet count between the hypothyroid and euthyroid patients. As expected, there were proportionately more women than men (ratio 12:3) among those with hypothyroidism. Thyroid autoantibodies were present in seven of the 11 patients screened prospectively (five with giant cell arteritis and two with polymyalgia rheumatica).

Comment

Hypothyroidism occurred concurrently with polymyalgia rheumatica and giant cell arteritis or developed during follow up in a high proportion of patients (15/36). This has important implications for the treatment of patients in whom the rheumatic symptoms of hypothyroidism[2] could be misconstrued as an exacerbation of their symptoms, resulting in unnecessary increases in the steroid dose. This happened in one of our patients: the typical symptoms of polymyalgia rheumatica responded to steroid treatment, but a year later she developed aches and pains with general malaise suggesting a relapse of the disease. At this stage her erythrocyte sedimentation rate was normal, although her mean corpuscular volume was raised. Her steroid dose was increased, but her condition did not improve. Measurement of the serum thyroxine and thyroid stimulating hormone concentrations confirmed the development of primary hypothyroidism. Her symptoms improved with thyroxine replacement. Despite remaining euthyroid she had one relapse of her polymyalgia rheumatica when her steroid dose was reduced.

The association of the two conditions supports the idea of a common autoimmune aetiology. More work is needed to assess the importance, if any, of thyroid autoantibodies in euthyroid patients with polymyalgia rheumatica or giant cell arteritis.

1 How J, Bewsher PD, Walker V. Giant cell arteritis and hypothyroidism. *Br Med J* 1977;ii:99.
2 Golding DN. The musculo-skeletal features of hypothyroidism. *Postgrad Med J* 1971;**47**:611-4.

(Accepted 8 December 1988)

Revision arthroplasty: a high price to pay

Clark R Dreghorn, David L Hamblen

Department of Orthopaedic Surgery, Western Infirmary, Glasgow G11 6NT
Clark R Dreghorn, FRCS, *orthopaedic senior registrar*
David L Hamblen, FRCS, *professor of orthopaedic surgery*

Correspondence to:
Mr C R Dreghorn, University Department of Orthopaedic Surgery, Clinical Sciences Building, St James's University Hospital, Leeds LS9 7TF.

Br Med J 1989;**298**:648-9

Expenditure in the NHS has never been under greater scrutiny. Although total hip replacement is one of the most cost effective advances in medical technology,[1] many orthopaedic surgeons are facing criticisms about its costs and are under pressure to reduce unit costs. In 1983 we assessed the costs of primary joint replacements.[2] We have now evaluated the costs of all revision arthroplasties carried out in the same year to make direct comparisons.

Methods and results

The time to failure of the replacement joint and any investigations performed to determine the cause of failure were noted from the patients' case records. The duration of inpatient stay was calculated, including the time spent in hospital for treatment of complications as a result of failure of the primary arthroplasty in addition to the perioperative period itself. Details of the operative procedure and any antibiotics prescribed were noted. Prices current when the expenditure was incurred were obtained from the hospital's pharmacy and stores department records.

The table gives data on all revision hip and knee arthroplasties performed in 1983. The interval from primary to revision surgery showed no notable difference between patients with and without infection of the joint, but those with infection had a longer mean duration of inpatient stay (hip replacement 73 *v* 28 days; knee replacement 47 *v* 42 days).

Eight of the 27 patients who had revision hip replacements and four of the 13 who had revision knee replacements required admission before their revision surgery, spending on average 30 and 69 additional days in hospital respectively.

There is a fixed policy for antibiotic prophylaxis in primary joint replacement, and bone cement containing antibiotic was not used in any primary operations. This allowed a direct comparison to be made between the costs of antibiotics at primary and revision arthroplasty (£8.69 *v* £98).

The greater range of implants used in revision arthroplasty resulted in a higher average cost for each revision operation compared with the equivalent primary procedure (hips £119 *v* £108, knees £442 *v* £361).

Details of revision joint replacement in 1983. Figures are numbers of patients except where stated otherwise

	Hip	Knee
Primary arthroplasties	216	61
Revision arthroplasties	27	13
Mean (range) interval to revision (years)	6·3 (1·8-13·0)	5 (1·8-10·3)
Cause of revision procedure:		
Mechanical loosening	18	7
Infection	6	5
Other	3	1
Duration of perioperative hospital stay (days):		
Primary arthroplasty	20	31
Revision arthroplasty	38	43
Type of revision:		
Exchange arthroplasty	24	12
Excision arthroplasty	3	1
Antibiotic use during revision procedure:		
Systemic antibiotic used	26	13
Duration of treatment (days)	18	28
% Increase in duration of treatment over primary arthroplasty	419	393
Antibiotic cement used	16/24	9/12
Total cost/patient (£)	90	114

Comment

Since 1970 the number of revision arthroplasties being performed each year at this hospital has increased progressively from 10 a year in 1970-4 to 22 a year in 1981-5. Our previous study showed that almost 90% of the expenditure on a joint replacement (£2440 out of £2730) was due to the hotel costs incurred. These new data show that costs are greatly increased when patients require revision operations, not only at the

time of the operation but also because inpatient investigations and treatment are necessary.

Revision operations take longer to perform than the equivalent primary procedure and are certainly more expensive in terms of the consumable items used. Twenty five out of 36 of the exchange arthroplasties used cement impregnated with antibiotic, and 27 required non-standard implants.

The cost of antibiotics was over 10 times that incurred with primary surgery because combined, often parenteral, treatment with expensive drugs was given for long periods.

To reduce the costs to the patient and the NHS all efforts must ensure that a primary joint replacement is as successful as possible. We caution against short term economies, which may well produce considerable clinical and financial burdens in the long term.

We thank Miss Margaret Richardson, principal pharmacist, and theatre sisters Margaret Douglas and Pat McDonald for their invaluable help, and the consultant orthopaedic surgeons of Gartnavel General Hospital for allowing their patients to be included in the study.

1 Williams A. Economics of coronary artery bypass grafting. *Br Med J* 1985;**291**:326-9.
2 Dreghorn CR, Roughneen P, Graham J, Hamblen DL. The real cost of joint replacement. *Br Med J* 1986;**292**:1636-7.

(Accepted 2 December 1988)

Retention of skills by advanced trained ambulance staff: implications for monitoring and retraining

Geraldine Walters, Edward Glucksman

Accident and Emergency Department, King's College Hospital, London SE5 9RS
Geraldine Walters, BSC, *research associate*
Edward Glucksman, FRCP, *consultant*

Correspondence to: Ms Walters.

Br Med J 1989;**298**:649-50

In the United Kingdom there are no formal recommendations for monitoring ambulance staff who have training in advanced cardiac life support skills. Although the NHS Training Authority's guidelines for extended training of ambulance staff describe the content of courses in detail, recommendations for monitoring standards are limited.[1] To assess the need for monitoring we evaluated the performance of ambulance staff who had been trained in advanced cardiac life support skills but had not been formally monitored or retrained over two years.

Subjects, methods, and results

In 1985, 17 ambulance staff in London were trained in advanced cardiac life support skills. The table shows the training programme and protocols of treatment. After the training they submitted reports and electrocardiograms/audiocassette tapes (dual channel cassette tapes providing an electrocardiogram and audible record of the incident) on all patients requiring advanced skills. In 1987 all reports and tapes available for these patients were assessed for recognition of rhythms; correct treatment of arrhythmias according to the protocols; compliance with the sequence of treatment stated in the protocols; quality of the electrocardiogram; time to direct current shock (for patients found in ventricular fibrillation); and continuity of basic life support.

From 99 cases of cardiac arrest 57 tapes were available for assessment. In 100 out of 111 episodes the rhythm was accurately recognised. Drugs were given correctly in 49 out of 57 cases. Defibrillation was attempted on 54 occasions: 34 were appropriate and nine inappropriate, and in 11 cases assessing whether the shock was appropriate was impossible because of inadequate or missing electrocardiograms. In nine patients some of the treatment was given on the basis of inadequate electrocardiograms. On two occasions the electrocardiograph's "gain" seemed to have been turned down. On four occasions "quick look" paddles were used but the resulting trace was inadequate, and on three occasions the trace was distorted by artefact. In 17 cases the patient was intubated or moved to the ambulance before electrocardiograph leads were applied. The mean time from arrival of the ambulance crew to delivery of the first shock was 4·3 (SD 2·7) minutes (range 1-9 minutes; 27 cases assessed). The mean time from the first appearance of ventricular fibrillation on the oscilloscope to delivery of the first shock was 66 (46) seconds (range 22-221 seconds). Interruptions to basic life support of longer than 30 seconds occurred in 23 cases.

Comment

The ambulance staff showed a good knowledge of the protocols of treatment and the electrocardiographic rhythms encountered. Errors in applying skills were more common and resulted in delays in defibrillation (often secondary to the patient being intubated or moved before electrocardiograph leads were applied), interruptions to basic life support, and the risk of inappropriate treatment as a result of an inadequate electrocardiogram. Improvement in these would have optimised the lifesaving capabilities of the staff, but as the staff did not receive any feedback they were probably unaware of how they might improve their performance.

The results suggest that the initial training programme was sufficient in theoretical content but required more emphasis on practical aspects. The protocol was not clear about what equipment and procedures should be used first when attending a possible cardiac arrest. Monitoring of staff is therefore necessary to assess the adequacy of the initial training programme, to evaluate how training translates into practice, and to identify aspects in which retraining is required.

Review of electrocardiograms/audiocassette tapes in

Details of advanced training programme (full programme lasts six weeks) and protocols of treatment for ambulance staff

Staff eligible for programme	Content of course	Assessment	Training given by	Practical skills acquired
Selected staff	Two weeks' theoretical work	Written examination	Hospital consultants and ambulance instructors	Cardiac monitoring
Staff trained in intubation and infusion	One week's practical work in classroom	Oral examination		Use of defibrillator
Staff able to pass written test before course	Three weeks' practical work in hospital	Practical assessment with manikin		Administration of selected drugs by endotracheal tube and intravenous routes according to set protocols*

*Ventricular fibrillation: precordial thump → shock 200 J → shock 200 J → shock 400 J → intubation → lignocaine 200 mg → shock 400 J → adrenaline (20 ml) 1/10 000 → shock 400 J. Asystole: intubation → atropine 2 mg → adrenaline (20 ml) 1/10 000 → isoprenaline 100 μg.