

Patients, methods, and results

We reviewed the records of 64 consecutive diabetic patients who had undergone elective aortoiliac or femoral bypass (43 patients) or aortoiliac thromboendarterectomy (21) from January 1975 to July 1982. From the 1236 non-diabetic patients who had undergone the same operations within the same period we selected 64 patients at random without knowledge of postoperative morbidity but matched to the diabetics for age (means 60 years (diabetics) and 57 years (non-diabetics)), sex (27 women and 37 men), and weight (mean 78 kg (diabetics) and 79 kg (non-diabetics)). Similar numbers of diabetics and controls had heart failure (25 and 21 respectively), angina pectoris (12 and 11), and hypertension (12 and 13). Twenty three diabetic patients compared with 18 controls were treated with digoxin. Diuretics were used in 26 diabetics and 19 controls. Beta-blockers were taken by 11 diabetics and eight controls. The degree of peripheral arteriosclerosis, as estimated from arteriograms, was similar in the two groups.

The average duration of diabetes was 10.8 years (range four to 18 years). Twenty three patients received insulin and 22 oral antidiabetic agents, and 19 were treated by diet. Two patients had severe retinopathy, five nephropathy, and 17 polyneuropathy. Postoperative treatment of the diabetics was based on results of four daily blood glucose tests.

All patients in both groups received prophylactic anticoagulation with phenprocoumon (Marcoumar) and antibiotics (penicillin and an aminoglycoside). The surgical procedures were similar in the two groups, and more than 95% were performed by the same three surgeons. Fisher's exact test was used to compare postoperative morbidity data in the two groups, and Student's *t* test for unpaired data to compare blood glucose concentrations; probabilities below 0.05 were considered to be significant. Calculation of type II error was made according to Feinstein.³

The table gives data on postoperative morbidity. There was no difference in the total number of complications between the two groups (15 in the diabetic group (one patient with two complications) and 14 in the control group; *p* > 0.5). The mean difference in the incidence of complications was 1.5% (95% confidence limits -13% to +16%).

Of the diabetics with complications, five received insulin and six oral antidiabetic agents, and three were treated by diet. There was no difference (*p* > 0.4) in postoperative blood glucose concentrations between diabetic patients with and without complications. Thus mean (SEM) fasting blood glucose concentrations before and 24, 48, 72, and 96 hours after surgery were 7.8 (0.4), 7.1 (0.3), 8.3 (0.5), 8.8 (0.8), and 9.3 (0.8) mmol/l (122 (7.2), 128 (5.4), 150 (9), 159 (14.4), and 168 (14.4) mg/100 ml) in the diabetics with complications and 8.1 (0.2), 7.4 (0.2), 8.9 (0.4), 8.9 (0.3), and 8.7 (0.4) mmol/l (146 (3.6), 133 (3.6), 160 (7.2), 160 (5.4), and 157 (7.2) mg/100 ml) in those without complications.

The risk of overlooking a 25% difference (type II error) in the incidence of complications between diabetic and non-diabetic patients—that is, from the actual incidence of 22% to 28%—was less than 20%. The risk of overlooking a 50% increase in morbidity in the diabetic patients (from the actual 22% to 33%) was less than 5%.

Postoperative complications after major vascular procedures in diabetic and non-diabetic patients (no deaths occurred)

	Diabetics (n = 64)	Controls (n = 64)
Wound infection	4	3
Venous thrombophlebitis	1	1
Pulmonary embolism		
Septicaemia		
Arterial or prosthetic thrombosis or embolism	4	2
Pneumonia	4	4
Urinary tract infection	2	3
Acute myocardial infarction		1
Total morbidity	15 (23.4%)	14 (21.9%)

Comment

We found no difference in the incidence of complications postoperatively between diabetic patients and matched controls. No correlation was found between the types of diabetes and the incidence of complications. Blood glucose concentrations were almost identical in diabetic patients with and without complications.

It might be argued that our study included too few patients for a significant difference in postoperative morbidity to be shown. Nevertheless, the risk of a type II error (overlooking a 50% or more difference in the incidence of postoperative complications) was less than 5%. We therefore concluded that diabetics undergoing major vascular surgery do not have a greater risk of postoperative complications.

Our results support those of a recent retrospective study in which postoperative morbidity was similar in diabetic and matched non-diabetic control patients undergoing gallbladder surgery.⁴ There is thus some evidence against the common belief that diabetes mellitus

is associated with increased postoperative morbidity, but studies of other surgical procedures are needed.

¹ Cruse PJE, Ford R. A five year prospective study of 23 649 surgical wounds. *Arch Surg* 1973;107:206-11.

² Kahn O, Wagner W, Bessman AN. Mortality of diabetic patients treated surgically for lower limb infection and/or gangrene. *Diabetes* 1974;23:287-92.

³ Feinstein AR. Clinical biostatistics. XXXIV. The other side of "statistical significance": alpha, beta, delta and the calculation of sample size. *Clin Pharmacol Ther* 1975;18:491-505.

⁴ Walsh DB, Eckhauser FE, Ramsburgh SR, Burney RB. Risk associated with diabetes mellitus in patients undergoing gall bladder surgery. *Surgery* 1982;91:254-7.

(Accepted 15 June 1983)

Department of Vascular Surgery D, Rigshospitalet, Copenhagen, Denmark

ALLAN HJORTTRUP, MD, senior registrar

BO FELDT RASMUSSEN, MD, registrar

HENRIK KEHLET, MD, senior registrar

Correspondence to: Dr A Hjortrup, Akacievej 27, 2791 Dragør, Denmark.

Sciatic neuropathies

Most reports on sciatic neuropathies record wartime experience.^{1,2} We have reviewed the causes of sciatic nerve lesions in an urban peacetime setting.

Present study and results

All the patients were seen in the electromyography laboratory of a large general hospital for evaluation of leg weakness. Each was examined by a neurologist and underwent nerve conduction and electromyographic studies.

Thirty nine electrophysiologically confirmed sciatic neuropathies were detected in 34 patients. The table summarises the causes.

Sciatic neuropathies: causes in 34 patients

	No of patients
External compression (four patients had bilateral neuropathies)	10
Hip fracture-dislocations	10
Hip surgery	6
Direct trauma	4
Miscellaneous (one patient had bilateral neuropathies)	4

External compression (10 patients)—Five patients developed sciatic neuropathies after an episode of coma resulting from an overdose of drugs or alcohol or both. Two patients had prolonged coma after a head injury and their bilateral neuropathies resulted from being bedridden for many weeks. One patient developed bilateral sciatic nerve compression after an eight hour operation in the sitting position. One patient worked for a long time in a cramped position with his buttock against a sharp edge.

Hip fracture-dislocations (10 patients)—The typical injury was a hip fracture including the posterior acetabulum. The commonest cause was a motor vehicle accident.

Hip surgery (six patients)—Five patients had had total hip replacements and one a Chiari type pelvic osteotomy.

Direct trauma (four patients)—These patients had suffered direct injuries to the thighs, but only one had a fractured femur.

Miscellaneous (four patients)—One patient had endometriosis at the sciatic notch, compressing the sciatic and inferior gluteal nerves. Another developed compression at this site from a haematoma resulting from anticoagulation treatment for a pulmonary embolus after a hip replacement. In only one patient (with bilateral sciatic neuropathies) were the lesions due to injections. One patient had a sciatic neuropathy as part of a mononeuritis multiplex syndrome of unknown aetiology.

Comment

In war missile injuries account for most sciatic nerve lesions.^{1,2} In our peacetime experience trauma is also the single commonest cause, particularly fracture-dislocations of the hip resulting from motor vehicle accidents. Sciatic neuropathies due to fractures of the shaft of the femur are considerably less common. The second commonest

cause is external compression due to coma induced by drugs or alcohol. Awareness of this condition is important, as leg weakness in a patient recovering from coma may be misinterpreted as being due to an intracranial lesion. Sciatic neuropathy occurring as an intra-operative pressure palsy or during prolonged immobilisation in bed is less well recognised than pressure palsies of the ulnar and peroneal nerves, but our findings illustrate that the sciatic nerve is also vulnerable in these situations.

Six patients developed sciatic neuropathy after hip surgery, particularly hip replacement. In one centre this has been reported as occurring in 0.5% of hip replacement operations.³ The nerve may be damaged by the heat of the setting cement, the cement itself, or by retraction. These neuropathies have been said to have a good prognosis for recovery, and our findings confirm this.

¹ Seddon H. *Surgical disorders of the peripheral nerves*. Edinburgh: Churchill Livingstone, 1975.

² Sunderland S. *Nerves and nerve injuries*. Edinburgh: Churchill Livingstone, 1978.

³ Weber ER, Daube JR, Coventry MB. Peripheral neuropathies associated with total hip arthroplasty. *J Bone Joint Surg* 1976;58A:66-9.

(Accepted 17 June 1983)

Department of Neurology and Neurosurgery, McGill University, The Montreal General Hospital, Montreal, Quebec H3G 1A4, Canada

J D STEWART, MB, FRCP(C), associate professor

E ANGUS, MD, resident

D GENDRON, MD, FRCP(C), resident

Correspondence to: Professor J D Stewart.

Seasonal variation in incidence of brachial and femoral emboli

The heart is the most common source of brachial and femoral emboli.¹ Rheumatic endocarditis of mitral or aortic valves (particularly associated with atrial flutter or atrial fibrillation), mural thrombi secondary to myocardial infarction, and prosthetic valves are often predisposing factors. I examined the case records of patients in whom peripheral arterial embolus had been diagnosed to compare the incidences of brachial and femoral emboli and to determine whether seasonal variation occurred.

Patients, methods, and results

Analysis was made of 127 consecutive patients (mean age 70.6 (range 41-92) years) presenting with brachial or femoral embolus referred to consultant surgeons with a specialist interest in vascular surgery on one unit of the Royal Infirmary of Edinburgh during the 11 years to 17 April 1983. Femoral embolus was significantly more common than brachial embolus (88 patients v 39; $p < 0.001$). There was no relation to sex (59 men, 68 women).

The table shows the seasonal distribution of systemic embolus, with a peak incidence during the winter months and a trough in summer. Comparison of the periods October to March with April to September yielded a significant difference ($\chi^2 = 8.574$, $df = 1$, $p < 0.01$). The hypothesis of a constant incidence throughout the year was not reasonable ($\chi^2 = 29.19$, $df = 11$, $p = 0.0021$), but when the logarithms of the observed counts were submitted to regression on a sine (month) and cosine (month) scale jointly on a 12 month cycle assuming Poisson type errors, goodness of fit was satisfactory ($\chi^2 = 13.46$, $df = 9$, $p = 0.14$).

Monthly distribution of brachial and femoral emboli over 11 years

	Brachial embolus	Femoral embolus	Total
July	2	7	9
August	2	3	5
September	2	8	10
October	2	11	13
November	1	9	10
December	6	11	17
January	7	15	22
February	2	6	8
March	4	6	10
April	8	6	14
May	2	4	6
June	1	2	3
Total	39	88	127

Comment

The distribution of systemic emboli may be related to external temperature. Increased mortality from ischaemic heart disease and stroke during the winter is well documented.²⁻⁴ Although incidence cannot be equated with mortality (which may change differentially), a similar seasonal influence is seen with recordings of systolic and diastolic blood pressure.²

Bull *et al* investigated the relation of air temperature to various chemical, haematological, and haemostatic variables.⁵ They concluded that there was no association with either routine haematological or clinical chemical variables. The correlation between increased antithrombin III concentrations and higher temperatures (and consequently an increased tendency to thrombosis at lower temperatures) is consistent with increased mortality from vascular accidents at lower temperatures. This is countered, however, by an inverse relation between fibrinolytic activity and temperature—that is, increased fibrinolysis at lower temperatures.

In conclusion, a significant seasonal variation was found in the incidence of brachial and femoral emboli. The reasons for this remain uncertain although there may be a correlation with external temperature.

I thank Mr B Nolan for permission to report these figures, Dr M Tweedie for statistical advice, and Miss M Corr for typing the manuscript.

¹ Strandness DE. Vascular diseases of the extremities. In: Thorn GW, Adams RD, Braunwald E, Isselbacher KJ, Petersdorf RG, eds. *Harrison's principles of internal medicine*. 8th ed. Tokyo: McGraw-Hill Kogakusha, 1977:1322.

² Brennan PJ, Greenberg G, Miall WE, Thompson SG. Seasonal variation in arterial blood pressure. *Br Med J* 1982;285:919-23.

³ Bull GM, Morton J. Environment, temperature and death rates. *Age Ageing* 1978;7:210-24.

⁴ Bull GM. Meteorological correlates with myocardial and cerebral infarction and respiratory disease. *British Journal of Preventive and Social Medicine* 1973;27:108-13.

⁵ Bull GM, Brozonic M, Chakraborti R, *et al*. Relationship of air temperature to various chemical, haematological and haemostatic variables. *J Clin Pathol* 1979;32:16-20.

(Accepted 28 June 1983)

Vascular Surgical Unit, Royal Infirmary, Edinburgh EH3 9YW

CHARLES V CLARK, BSC, MB, senior house officer

Correspondence to: Dr C V Clark, Research Fellow, Department of Ophthalmology (University of Liverpool), St Paul's Eye Hospital, Old Hall Street, Liverpool L3 9PF.

Wheelchairs used by old people

Two thirds of the 200 000 wheelchairs in England and Wales are used by people over retirement age.¹ Most wheelchairs have inflatable tyres, and the brakes work by a plate pressing against the tyre. If the tyre is flat the brake will not function effectively and propelling and steering the wheelchair may be difficult. If the brake does not work properly getting in and out of the wheelchair may be hazardous. We have observed that many wheelchairs used by elderly people have inefficient brakes and flat tyres.

Patients, methods, and results

We interviewed 61 elderly users of wheelchairs in their homes; 55 of them were attending Sherwood Geriatric Day Hospital. The main disabilities necessitating provision of a wheelchair were stroke (34 patients (57%)), arthritis (eight (13%)), and amputation (eight (13%)). Thirty three of the patients were women.

Fifty nine of the wheelchairs were on loan from the Department of Health and Social Security. Three quarters were self propelling, general purpose wheelchairs, the remainder being attendant propelled, transit wheelchairs. Two wheelchairs had solid tyres; the rest had pneumatic tyres.

We asked the patients to demonstrate how to operate the brakes and to produce a pump and show us how to use it. We assessed mental function using a 10 point memory questionnaire. Examination of the wheelchair included inspection of tyres and brakes. We considered tyres to be inadequately inflated if the brake action was compromised by lack of inflation.

We found one puncture, and 18 other wheelchairs had flat tyres. Of the