guidelines, whether they were certified providers of advanced cardiac life support or advanced life support, and postgraduate qualifications. Each doctor's management of ventricular fibrillation was compared with the protocol stipulated in the council's guidelines.

The results were analysed by χ^2 analysis. We contacted 113 doctors, all of whom agreed to participate in the survey. Twenty were registrars, 50 senior house officers, and 43 house officers. Fifty six doctors led the cardiac arrest team.

Thirty two doctors knew the full sequence of managing ventricular fibrillation, and 49 knew the initial management; 32 were unable to state correctly the initial management. Minor mistakes such as omitting the precordial thump were ignored. The major mistakes are shown in the table.

Major mistakes in initial management of ventricular fibrillation among 113 doctors in cardiac arrest teams

Mistake	No of doctors
Choosing lignocaine, atropine, or bretylium instead of adrenaline as first line drug	12
Performing chest compressions and manual ventilation before defibrillation	7
Using low energy shocks (for example, 120 J) for defibrillation	5
Performing defibrillation, airway management, cardiopulmonary resuscitation, and intravenous treatment in wrong order	5
Trying defibrillation an inadequate number of times	3
Total	32

Seventy seven doctors had had practical training within the previous year, of whom 59 knew the management of ventricular fibrillation. Thirty six did not have practical training, of whom 22 knew the management sequence. This difference (15.5%) (95% confidence interval -30.1% to 34%) was not significant. Team leaders and members and different grades of doctors did not differ significantly in their knowledge of the management of ventricular fibrillation. Seventy nine doctors had heard of certified courses in life support but only eight were certified providers. Only 45 knew that the guidelines were those of the European Resuscitation Council. Forty eight doctors were taught the guidelines at inhouse training pro-

grammes, most of which were induction courses for junior doctors. Forty eight had read the guidelines in material from inhouse training programmes, 30 had read them in publicity material such as wall posters, 27 had read them in the *BMJ*; eight had read them elsewhere or could not recall the source.

Comment

The resuscitation skills of preregistration house officers and candidates for the MRCP examination are poor.^{4,5} The need for practical training and revision has long been recognised. We studied the doctors in cardiac arrest teams, who would be expected to be thoroughly conversant with the new guidelines on advanced life support. It is therefore surprising that less than a third of them could recall the full sequence of management of ventricular fibrillation. Doctors who had had practical training seemed better versed in managing ventricular fibrillation than those who had not, though the difference was not significant.

Most of the hospitals surveyed provide practical training for their preregistration house officers. The aim now should be that all grades of doctors are given advanced life support training, continued training, and the opportunity to rehearse cardiac arrest procedures. Certified life support courses provide excellent training, yet the proportion of doctors surveyed who had had such training was small. Ideally, all members of cardiac arrest teams should be certified providers of life support techniques, but we suggest that at least the team leader should have such training.

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Department of Medicine,
University of Glasgow,
Glasgow Royal Infirmary,
Glasgow G3 7ER
John A Thomson, reader

Department of Medicine
and Therapeutics, Western
Infirmary, Glasgow
G11 6NT
David L Davies, senior
lecturer

Department of Medicine,
Stobhill Hospital, Glasgow
G21 3UW
Eon H McLaren, consultant

Institute of Neurological
Sciences, Southern
General Hospital, Glasgow
G51 4TF
Graham M Teasdale,
professor of neurosurgery

Correspondence to:
Dr Thomson.

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Ten year follow up of microprolactinoma treated by transsphenoidal surgery

John A Thomson, David L Davies,
Eon H McLaren, Graham M Teasdale

In 1985 we published the results of transsphenoidal surgery in 61 women with microprolactinoma.¹ Early results were satisfactory in over 80% of patients. Only two out of 21 patients with a normal postoperative prolactin concentration had a relapse after five years. This paper documents the 10 year outcome.

Patients, methods, and results

We tried to obtain information about patients who were not currently being followed up in Glasgow by contacting their general practitioner, referring specialist, and the patients themselves, achieving a 10 year follow up in 45 of the 61 patients (74%). We defined cure of hyperprolactinaemia as a plasma prolactin concentration within the reference range (60-360 mU/l), operative failure as a persistently raised

prolactin concentration, and recurrence as a sustained increase in prolactin concentration after a normal value had been achieved. In four patients prolactin concentration was variably raised during follow up.

The overall results are shown in the figure. Cure rates at 10 years were similar to those at five years (hyperprolactinaemia 73% (95% confidence interval 58% to 85%), amenorrhoea 76% (60% to 87%), galactorrhoea 87% (73% to 95%), and infertility 82% (68% to 92%).

Eleven patients were amenorrhoeic at 10 years: three were menopausal, three had primary operative failure, two had had a hysterectomy (for ovarian cancer and menorrhagia), and three had some evidence of post-operative hypopituitarism. All but eight patients became pregnant. Although infertility was a major indication for operation, four decided postoperatively not to attempt pregnancy despite achieving a normal prolactin concentration. One of the remaining four patients had premature ovarian failure, two had hypopituitarism, and one had a hysterectomy for ovarian carcinoma three years after a successful hypophysectomy. The remaining 37 patients achieved 63 pregnancies, of which six miscarried. Only one of these six patients did not subsequently achieve a successful term delivery. Seven patients (all with primary operative failure) were still taking bromocriptine. Four were

Follow up over 10 years of 61 patients with microprolactinoma who had transsphenoidal surgery

receiving thyroxine; in two the need was questionable. Two patients were taking steroids, possibly unnecessarily in one case. One patient was receiving hormone replacement therapy.

The true recurrence rate is difficult to assess because of the variability in serum prolactin concentrations in some patients. During the 10 years of follow up there was evidence of recurrence of hyperprolactinaemia in six of the 45 patients (13%) at two, four, seven, eight, and 10 years (two patients). One patient developed a raised serum prolactin concentration three months postoperatively, but defaulted from the study after five years. This gives an overall known recurrence rate of seven out of 61 patients (12%). One relapse at 10 years was marginal (prolactin concentration 550 mU/l). Sustained amenorrhoea occurred in only one out of six patients with recurrent hyperprolactinaemia. In one, hyperprolactinaemia reverted spontaneously after 13 years. In four of the six with the highest prolactin concentrations repeated computed tomography

showed no evidence of tumour. Thus at 10 years only four of the 45 patients (9%) had definite recurrence of hyperprolactinaemia—that is, four of the 39 patients (10%) who had a normal postoperative prolactin concentration.

Comment

The initial results of transsphenoidal surgery for microprolactinoma are good. In 1983 Serri *et al* reported an incidence of apparent recurrence of hyperprolactinaemia in 50% of patients (12/24) with microprolactinoma five years postoperatively.² Our findings¹ and those of Scanlon *et al*³ and Bevan *et al*⁴ did not confirm this observation. Other American and European authors, however, have reported higher recurrence rates. Our 10 year follow up showed that transsphenoidal surgery was successful overall in 73% of patients. Relapses did occur, however, and in some patients the prolactin concentration was quite variable.

Serri *et al* reported a 10 year cure rate for hyperprolactinaemia of 56% and a clinical remission rate of 75% in 57 patients after successful operations.⁵ We confirm that transsphenoidal surgery for microprolactinoma remains a reasonable treatment with satisfactory long term results in selected patients.

We are grateful to our colleagues in other hospitals and in general practice who provided details of long term outcome of patients. We particularly thank our biochemical colleagues, especially Dr Graham Beastall and Dr Christina Gray of the Institute of Biochemistry, Glasgow Royal Infirmary, who provided most of the hormone measurements. We gratefully acknowledge the statistical skills of Dr Gordon Murray.

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A MEMORABLE ILLNESS

Making use of gravity

I was reminded that life is full of coincidences when reading M G Jacoby's letter to his son on becoming a resident in a New York hospital (*BMJ* 1994;308:64). I also graduated in medicine in Newcastle upon Tyne 50 years ago, in fact in the same cohort as Dr Jacoby. I have not seen or heard of him since, which is not unlikely as I practised as a family doctor in Jarrow in north east England for 34 years.

One of my most vivid and painful memories of those years as a student was when I was acting as a house surgeon on an orthopaedic ward at the Royal Victoria Infirmary in Newcastle. One day, like Dr Jacoby's nurse patient, I developed a sore throat. I, too, had a throat swab which produced streptococci and diphtheria bacilli. I was immediately taken to an isolation hospital, although I cannot remember the journey, presumably because I was so ill. I was put to bed on my back and told not to move except to have antitoxin painfully injected into my buttocks. I suppose the streptococcal infection just took care of itself.

The consultant, who was a kindly refugee from central Europe, visited at least once a day and examined me

wearing rubber gloves, I know not why. Having examined me, he then asked me to say, not "Sister Susie's sewing shirts for soldiers," but "Pretty Polly." This was fairly boring, and I knew that the exercise was to detect a soft palate paralysis. I knew, too, that I was developing a soft palate paralysis and that if it was detected I would be kept in hospital for a further period. I discovered that if I sat up gravity would drop my soft palate and I could say the magic words clearly.

I was duly allowed home and I told my general practitioner father that I had a palatal palsy which he and I knew had an excellent prognosis. I duly recovered, having been away from the medical school for three months. I did suffer, however, from the medical student's neurotic outlook and thought that I had a myocarditis also. This enforced absence from college and hospital enabled me to read the textbooks from cover to cover and I passed my finals three months later. One of the questions in the medicine written paper was "Discuss the aetiology, diagnosis, and treatment of diphtheria."—G B GRANT *lives near Newcastle upon Tyne*