Testing acuity of vision in general practice: reaching recommended standard

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Measurements of acuity of vision are highly reliable—with a reliability in excess of 98% according to one important study[1]—because a standard protocol exists. The British Standards Institution specifies the minimum illumination for externally illuminated charts and the distance that patients should be from the chart.[2] Compliance with this standard helps to ensure comparable results in the measurement of acuity of vision. Patients' acuity of vision measured in the eye department at this hospital, however, sometimes differs from the measurement given in their referral letter. I examined whether general practice surgeries complied with standards on illumination and distances.

Methods and results

I randomly selected 24 of the 48 main general practices that fell within the boundaries of the former Torbay District Health Authority. Branch surgeries were excluded from the survey. In September 1993 I visited 22 of the 24 surgeries and measured the distance between the patient and the test chart with a 7 m metal tape measure to the nearest centimetre and the illumination falling on each chart with a luxmeter to the nearest 10 lx.

The 22 surgeries had 67 rooms with a fixed Snellen chart (the most commonly used chart for testing acuity of vision). All the surgeries had at least one chart, either a chart designed to be read at 3 m (54 rooms) or one to be read at 6 m (13). Two of the 6 m charts were of the reversed type—that is, the chart is behind the patient, who reads it in a mirror directly opposite.

The distance the patient had to stand from the chart was shown in only one of the examination rooms (which had a 6 m chart). None of the general practitioners or practice nurses was aware of the minimum lighting requirement of 480 lx.

The distance that the patient had to stand from a chart ranged from 206 cm to 480 cm (mean 305) for the rooms with 3 m charts and from 310 cm to 600 cm (512) for those with 6 m charts. External illumination ranged from 60 lx to 1600 lx (447) for the rooms with 3 m charts and from 100 lx to 725 lx (325) for those with the 6 m charts.

Comment

Few tests can quantify loss of any sensory function as easily as the test of acuity of vision. Loss of acuity may be the only indicator of the onset of serious eye disease. Testing acuity of vision is particularly important, for example, during the screening of diabetic patients for retinopathy including macular oedema. Even a one line change in acuity may be of importance and should arouse suspicion.

Driving is a key activity for people in isolated rural areas, both for employment and for daily living. The standards of vision for driving are strict; if testing of vision is inadequate public safety may be at risk or people may lose their livelihood unnecessarily.[3]

Recommendations

Distance

Snellen charts for testing acuity of vision should be the recommended distance from the patient for the size of chart used—that is, 300 cm for 3 m charts and 600 cm for 6 m charts. The distance should be marked so that it cannot be erased, and the patient should stand behind this mark.

Lighting

The minimum illumination for externally illuminated charts is 480 lx. This can easily be achieved by directing a spotlight at the chart.

This study shows that most general practitioners estimate rather than measure the distance between their patients and the vision test chart, and none of the doctors was aware of the minimum standards on illumination (see box for recommendations). Although I did not study the effect of the variation in distances and illumination on patients' recorded acuity of vision, it would be fair to assume that the reliability and reproducibility of measurements of acuity of vision made in general practice may be in doubt.

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1 Blackhurst DW, Maguire MG. Reproducibility of refraction and visual acuity measurement under a standard protocol. *Retina* 1989;9:163-9.
2 *BS 4274:1968. Specification for test charts for determining distance visual acuity.* London: British Standards Institution, 1968.
3 Raffle A. *Medical aspects of fitness to drive—a guide for medical practitioners.* 4th ed. London: The Medical Commission on Accident Prevention, 1985.

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Management of ventricular fibrillation by doctors in cardiac arrest teams

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Successful management of a cardiac arrest in accident and emergency departments or other specialised hospital units can be expected to result in a survival rate of around 50% initially and around 20% after one year.[1] The protocol for managing ventricular fibrillation and the importance of rapid defibrillation were emphasised in the European Resuscitation Council guidelines 1992 on advanced life support.[2,3] We investigated knowledge of these guidelines among doctors in cardiac arrest teams with respect to the management of ventricular fibrillation.

Methods and results

In December 1993 and January 1994 we conducted a telephone survey of 113 doctors in the cardiac arrest teams from 62 teaching and district hospitals in England and Wales. These hospitals were randomly selected from the 1993 directory of the British Association for Accident and Emergency Medicine. The doctors carrying cardiac arrest pagers were contacted consecutively on the same day through their hospital operators to prevent discussion between them. They were asked about management of a witnessed cardiac arrest due to ventricular fibrillation, practical training for cardiopulmonary resuscitation within the previous year, knowledge of the European Resuscitation Council

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 mangement 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 programmes, 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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2 Advanced Life Support Working Party of the European Resuscitation Council. Guidelines for advanced life support. *Resuscitation* 1992;24:111-22.

3 European Resuscitation Council. Adult advanced cardiac life support: the European Resuscitation Council guidelines 1992 (abridged). *BMJ* 1993;306: 1589-93.

4 Morris F, Tordoff SG, Wallis D, Skinner DV. Cardiopulmonary resuscitation skills of preregistration house officers: five years on. *BMJ* 1991;302:626-7.

5 David J, Prior-Willeard PFS. Resuscitation skills of MRCP candidates. *BMJ* 1993;306:1578-9.

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Ten year follow up of microprolactinoma treated by transsphenoidal surgery

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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 postoperative 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