are currently so preoccupied with the funding implications of change. But rejoicing may yet be premature, for the spectre of a higher prevalence of factor VIII inhibitors in patients receiving high potency concentrates needs to be looked at and, we hope, dispelled.

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For Debate

Guidelines for the management of convulsions with fever

Joint Working Group of the Research Unit of the Royal College of Physicians and the British Paediatric Association

A workshop on the subject of childhood convulsions with fever was held at the Royal College of Physicians, London, on 3 July 1990 under the joint auspices of the Research Unit of the Royal College of Physicians and the British Paediatric Association. There were 21 invited participants, of whom 11 prepared background papers on various aspects of the subject (appendix). The background papers were circulated before the meeting, and after discussion, which was often brisk, this report was agreed.

Definition

The working group considered that it was important to distinguish "convulsions with fever" and "febrile convulsions." Convulsions with fever include any convulsion in a child of any age with fever of any cause. For the purposes of clinical management the term febrile convulsions should be limited to "an epileptic seizure occurring in a child aged from six months to five years, precipitated by fever arising from infection outside the nervous system in a child who is otherwise neurologically normal." The working group considered that it was proper to use the term "epileptic" in so far as the neurophysiological substrate of a febrile convulsion is a paroxysmal neuronal discharge, as in an epileptic seizure.

Among children who have convulsions with fever are those with pyogenic or viral meningitis, herpes simplex encephalitis, other acute encephalitides, cerebral palsy with intercurrent infection, and metabolic or neurodegenerative disease with a seizure precipitated by fever. Children who have a prolonged seizure or who have not completely recovered within one hour should be suspected of having one of these conditions and investigated accordingly.

Primary care

Much discussion centred on the question of when children with fever and convulsions should be admitted to hospital. Some members of the working group thought that all should be admitted after a first convulsion, mainly because of anxiety about overlooking meningitis. Most members thought that some selection was possible. The following factors would favour admission after a first convulsion: (*a*) a complex convulsion—that is, one lasting longer than 20 minutes, with focal features, repeated in the same episode of illness or with incomplete recovery after one hour; (*b*) a child aged less than 18 months; (*c*) early review by a doctor at home not possible; (*d*) home circumstances inadequate, or more than usual parental anxiety, or parents' inability to cope. It should be remembered that a history of previous convulsions does not rule out the possibility of meningitis.

Investigations

No investigations are routinely necessary in all children after a febrile convulsion. It is prudent to measure the blood glucose concentration with a glucose oxidase strip in any child who is still convulsing or unrousable when seen either with or without fever. Other investigations will be determined by the febrile illness rather than by the convulsion, with the possible exception of lumbar puncture.

LUMBAR PUNCTURE

The possibility of failing to diagnose meningitis worries most doctors. The working group did not consider that all children who convulse with fever should have a lumbar puncture. A lumbar puncture should, however, be performed if there are clinical signs of meningism; after a complex convulsion; if the child is unduly drowsy or irritable or systemically ill; or if the child is aged less than 18 months (probably) and almost certainly if the child is aged less than 12 months. Ideally the decision should be taken by an experienced doctor, who may decide on clinical grounds that lumbar puncture is unnecessary even in a younger child, but when in doubt the investigation should be performed. The doctor deciding not to undertake a lumbar puncture should be prepared to review the decision within a few hours.

A comatose child must be examined by an experienced doctor before lumbar puncture because of the risk of coning.[1] Brain imaging may be necessary.

ELECTROENCEPHALOGRAPHY

An electroencephalogram is not a guide to treatment or to prognosis. It is not helpful after single or recurrent febrile convulsions. It may help if the clinical picture suggests pathological changes in the brain, but in this case computed tomography or magnetic resonance imaging will usually be performed first.

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Members of the joint working group are listed in the appendix

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Treatment

MANAGEMENT OF FEVER

The working group knew of no evidence that antipyretic treatment influences the recurrence of febrile seizures but believed that fever should be treated in order to promote the comfort of the child and to prevent dehydration. Physical methods such as fanning, cold bathing, and tepid sponging are likely to cause discomfort and are not recommended.[2,3] The use of an antipyretic drug is effective and paracetamol is preferred. An adequate fluid intake should be ensured.

ANTICONVULSANT DRUGS

Many paediatricians now advise rectal diazepam after the onset of a convulsion. Some members of the working group suggested that it should be used as soon as possible after the onset of a convulsion, accepting that in practice several minutes will usually elapse before it is given. Other members advised waiting for five minutes, by which time most convulsions will have stopped and the drug will not be necessary. Parents should be advised not to give it if the convulsion has stopped.

Episodic use of anticonvulsants in children with recurrent convulsions with fever—Although rectal diazepam may prevent convulsions when given at the onset of fever and a large oral dose of phenobarbitone may give an effective drug concentration in the blood by 90 minutes,[4] both are apt to cause drowsiness. The working group did not recommend their routine use in this way.

Long term anticonvulsant prophylaxis—The vogue for long term anticonvulsant prophylaxis against febrile convulsions seen in the 1970s and early 1980s has passed. The disappointing results of trials analysed on an "intention to treat" basis[5] and the known side effects of sodium valproate[6] and phenobarbitone had convinced the working group that long term anticonvulsant prophylaxis was rarely indicated. Occasionally drug prophylaxis may be used for a child who has frequent recurrences. There is no evidence that in the minority of children who later develop epilepsy the prophylactic use of anticonvulsant drugs would have prevented it.

Immunisation

With diphtheria, tetanus, pertussis, and poliomyelitis immunisation being given at 2 to 4 months, this schedule is likely to have been completed before febrile convulsions occur. Babies having convulsions with fever below the age of 4 months should be assessed by a paediatrician. Children who have febrile convulsions before immunisation against diphtheria, pertussis, and tetanus because the immunisation has been delayed should be immunised after their parents have been instructed about the management of fever and the use of rectal diazepam.[7]

Measles, mumps, and rubella immunisation should be given as usual to children who have had febrile convulsions, with advice about the management of fever to the parents.[7] Rectal diazepam should be made available for use should a convulsion occur (see above).

Prognosis

Unless there is clinical doubt about the child's current developmental or neurological state, the parents should be told that the prognosis as regards developmental and neurological impairment is excellent. The risk of subsequent epilepsy after a single febrile convulsion with no complex features is about 2·5%. With increasingly complex convulsions (three complex features) the risk rises to nearly 50% by 25 years of age,[8] but only about 1% of children with febrile convulsions are in this group. The risk of having further febrile convulsions is about 30% overall, increasing with younger age at first convulsion and approaching 50% in children aged less than 1 year at the time of their first convulsion. A history of febrile convulsions in a first degree relative is also associated with a risk of recurrence of nearly 50%.[9] A complex convulsion or a family history of epilepsy is probably associated with a modest increase in the risk of further febrile convulsions, but reports vary.[9] Combinations of risk factors have defined small subgroups of children with a reported risk of up to 100%.[9,10]

Information for parents

Information given to parents should include:

- An explanation of the nature of febrile convulsions, including information about the prevalence and prognosis
- Instructions about the management of fever, the management of a convulsion, and the use of rectal diazepam (see above)
- Reassurance.

This advice should be given verbally, and a supplemental leaflet may also be helpful. The British Paediatric Association is preparing a suitable leaflet.

Suggested audit measures for hospital practice

HOSPITAL RECORDS OF THE INDIVIDUAL CASE

Do the case notes contain:

- An accurate description of the convulsion, including its duration?
- Information about the nature of the episode?
- A record about the family history with regard to febrile and non-febrile seizures?
- The age at first seizure?
- The temperature on admission?
- Whether signs of meningitis were present or absent?
- An assessment of the cause of the fever?
- The child's neurodevelopmental state when recovered (estimated as far as practical)?
- The blood glucose concentration, if the child was seen during a convulsion?
- An estimate of the likely prognosis, advice to the parents about what to do if further seizures occur, and advice about future immunisation?
- What the parents were told at admission and before discharge?

Discharge summary—Does the discharge summary sent to the general practitioner contain information on the above points, and was it dispatched in a timely manner?

UNIT STATISTICS

Adverse outcomes—Have there been cases of meningitis diagnosed after an inappropriate delay? Has there been undue delay in the child receiving treatment for a prolonged convulsion?

Inappropriate investigation and treatment—Have the following been performed on or given to more than a small minority of patients:

- Electroencephalography?
- Blood urea and serum electrolyte estimations?
- Serum calcium estimation?
- Maintenance anticonvulsant treatment?

Clinical guidelines are published as they may help doctors by providing an analytical framework for the evaluation and treatment of some common clinical problems. They are not intended to replace a doctor's clinical judgment and are not necessarily the only way in which a particular condition can be managed. They do, however, provide a framework within which audit and review of clinical practice can take place. The guidelines presented here reflect the views of the individuals who attended the workshops.

Appendix

Members of the joint working group were: Dr Douglas P Addy[1] (chairman; Dudley Road Hospital, Birmingham); Dr Anthony P Hopkins (Research Unit, Royal College of Physicians, London); Dr Christopher J Bacon (Friarage Hospital, North Yorkshire); Dr J S Brown (general practitioner, County Londonderry); Dr Peter M Crowle (Norfolk and Norwich Hospital, Norfolk); Dr Neil S Gordon (clinical medical officer, Cheshire); Dr Stuart H Green (Birmingham Children's Hospital, Birmingham); Professor D Hull (University Hospital, Queen's Medical Centre, Nottingham); Dr S Lingam (Child Development Centre, Harlow); Dr Roderick MacFaul (Pinderfields General Hospital, West Yorkshire); Dr I A McKinlay (Royal Manchester Children's Hospital, Manchester); Dr David R Morgan (University of Birmingham); Professor B G R Neville (Wolfson Centre, London); Professor Niall V O'Donohoe (National Children's Hospital, Dublin); Dr Richard O Robinson (Guy's Hospital, London); Professor Euan M Ross (King's College School of Medicine and Dentistry, London); Dr N Rutter (Queen's Medical Centre, Nottingham); Dr G W Rylance (Birmingham Children's Hospital, Birmingham); Dr G Stores (Park Hospital for Children, Oxford); Dr R Sunderland (Selly Oak Hospital, Birmingham); Dr S J Wallace (University Hospital of Wales, Cardiff).

BACKGROUND PAPERS

The following background papers were circulated before the meeting:

(1) "What do we mean by 'febrile convulsions?'" (Professor B G R Neville).
(2) "How are febrile convulsions best managed in general practice? When should the child be admitted to hospital?" (Dr D R Morgan).
(3) "Which investigations is it useful to perform on a child following a febrile convulsion? When should lumbar puncture be performed?" (Dr N Rutter).
(4) "When does an EEG contribute to the management of febrile convulsions?" (Dr G Stores).
(5) "What is the prognosis following a febrile convulsion?" (Professor E M Ross).
(6) "How important is it to control fever? How is it best controlled? Does control of fever affect febrile convulsions?" (Professor D Hull).
(7) "What do we know about the drugs which may be used in children with febrile convulsions? What are the potential toxic effects of the drugs?" (Dr G W Rylance).
(8) "What is the place of drug prophylaxis?" (Dr S J Wallace and Dr I A McKinlay).
(9) "What information and advice should be given to parents?" (Dr D P Addy).
(10) "What future research should be undertaken?" (Professor N V O'Donohoe).

These background papers can be obtained from the Publications Department, Royal College of Physicians, 11 St Andrew's Place, Regent's Park, London NW1 4LE. Price £6.00 to cover costs of photocopying and postage.

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The Health of the Nation: responses

Strategy for stroke

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In the consultation document for health in England the government identified stroke as a possible priority for disease prevention and treatment.[1] We will consider how well stroke fulfils the criteria for a key area, what targets should be set, how we might achieve them, and what the problems are likely to be, particularly in monitoring any progress.

Making stroke a priority

The first criterion for a key area is that it should be a major cause of premature death or avoidable ill health either in the population as a whole or among specific groups of people. About 100 000 people each year have a first stroke in England; about 25 000 are less than 65 years old and another 29 000 are aged between 65 and 74.[2] Each year 64 000 deaths are attributed to stroke in England, representing 12% of all deaths.[1] Of these, 5000 deaths occur in those under 65 years and 11 000 in those aged 65-75 (5% and 9% of all deaths in each age category respectively).[1]

Stroke is also one of the commonest causes of severe disability.[3] Furthermore it consumes vast resources. Isard and Forbes estimated that in Scotland in 1988 stroke accounted for about 4·3% of all NHS resources and 5·5% of hospital resources.[4] The costs to patients, their families, and society must be huge but have never been quantified. Also it is a disease which even in Britain particularly affects certain ethnic groups[5] and the socially deprived.[6] Thus stroke is clearly an important avoidable cause of premature death and disability.

Effective interventions

The government's second criterion is that there should be effective interventions and scope for improvement in health. Certainly over the past 20 years most developed countries have seen a reduction in mortality from stroke (by 2-7% a year[7]), and this may be due to a fall in incidence of stroke,[8] although there is no definite evidence that the incidence is falling in England as the discussion document wrongly asserts.[1] Most of the observed reduction in mortality is unexplained, although the treatment of hypertension may have played some part.[9]

The figure shows the interventions which would reduce the incidence of stroke and associated mortality and disability. Some interventions, for instance primary and secondary prevention, would reduce not