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Significance of early postoperative fever in children

Fever is one of the earliest recorded signs of illness and has been a traditional observation in nursing care for centuries. A small rise in body temperature after operation is a well-recognised phenomenon, particularly in children, but its frequency and implication for care have never been assessed.

Patients, methods, and results

We studied 150 consecutive children (16 girls, 134 boys) undergoing operation for inguinal hernia. Three boys were also circumscised and two children underwent bilateral herniotomy. Age range was 4 months to 11 years (mean age 3·7 years). The procedure was planned on a day-case basis in all but 32 cases, and operations were performed by several different surgeons. All children were admitted on the morning of operation and recovered during the afternoon. During this period routine postoperative nursing observations were made, including at least two temperature recordings. The children were later seen by a doctor and allowed home at around 6 pm if their condition was found to be satisfactory; if it was not they remained in hospital. Children were visited several times at home by the district nurse and reviewed in hospital at one month by the medical staff.

Body temperature above 37°C was often recorded, and the table shows a relation between temperature reached and age. The incidence of fever over 37·5°C fell from 74% in those aged under 1 year to 28% in those over 4 years.

Proportion of children with fever after operation

	Fever (°C)		
	37–	37·5–	≥38
No (%) of children with fever within 24 hours	83 (55)	71 (47)	33 (22)
No (%) of children with fever at 6 pm	66 (44)	56 (37)	32 (21)
Average age (years)	3·1	2·9	1·9

Of 70 children with a temperature of over 37·5°C, 52 were essentially well, six vomited transiently, and 12 developed complications possibly associated with fever (haematoma or infections). Two children without fever developed similar complications. All of the complications were apparent clinically, sometimes after discharge.

Of the 118 children for whom day-case treatment had been planned, 48 were detained overnight. In 28 cases this was solely because fever had been recorded; a similar number, however, were discharged despite fever. None of these was unwell. Nine of those detained stayed two or more days on account of unexplained fever. Pain, vomiting, or social reasons accounted for the remaining 20 who stayed overnight.

Comment

Temperatures over 37°C are conventionally considered to be abnormal. If only temperatures over 37·5°C are considered, however, 70 (47%) of the 150 children studied were febrile within the first 24 hours. Interestingly, 12 of the 14 children who subsequently developed complications were from this febrile group. Complications were always apparent on clinical grounds, and decisions about management and discharge from hospital were never beneficially influenced by knowledge of the child's temperature. There therefore seems little useful predictive value in knowledge of fever in such cases.

The mechanism of the early postoperative rise in body temperature is not clear. A simple infective basis does not explain the relation above. There was no relation to postoperative chest infection. Excessive administration of atropine may result in fever,[1] but there was no relation here to atropine dosage or other premedication. Hyperpyrexia occurring during anaesthesia is probably a completely different phenomenon,[2] and no relation was noted here to the type of anaesthetic agent used. We suggest that the phenomenon may be a central response to the stress of surgery, entailing a transient adjustment of "set point" for temperature homoeostasis as occurs under other circumstances such as exercise.[3] This would explain its lack of serious implication. Furthermore, the strong inverse relation to age suggests that it is a relatively primitive response. Whether the mechanism is reabsorption of blood (analogous to fracture fever) or other consequences of trauma inflicted remains speculative.

These observations have important implications for the management of operations done on a day-case basis. Even when only the temperature recorded at 6 pm (the usual time of discharge) was considered, one-third of the patients were febrile (>37·5°C). We suggest that temperature is of poor predictive value and may lead to unnecessary admission to hospital. It seems wiser in this type of operation to avoid measuring children's temperatures.

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Facial burns due to fan heater

Facial heat injuries in toddlers are usually due to scalds. We describe a facial burn due to a fan heater, widely considered to be incapable of causing such injury.

Facial appearance of child 12 hours after injury.

Case report

A 10-month-old West Indian girl who had been crawling for one month was left unattended on the floor with a 3-kW electric fan heater switched to maximum. She was discovered minutes later to have fallen over the front

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corner of the heater with her face applied closely to the grill. She was immediately immersed under the cold-water tap of a bath, and medical help was sought.

On admission she had blistering burns mainly affecting the midface and the centre of her forehead, extending asymmetrically over the temporal region into the hairline. Her hair was not singed. There was considerable associated oedema, and the appearance 12 hours after injury is shown in the figure.

Treatment was by exposure, and after six days she had a clearly demarcated extensive superficial injury. A case conference accepted unanimously that this injury was accidental. The skin is currently beginning to repigment, but her ultimate facial appearance will depend on the uniformity of this repigmentation.

Comment

The appliance which caused the injury was a standard electricity board 3-kW fan heater and carries the British Standards Certificate symbol: the grill on the front constitutes an adequate guard from the elements as required by law. Electricity board sales staff are unaware of this potential hazard and do not recommend the use of fire guards with this heater. We suggest that an additional fire guard is essential when this appliance is used in the presence of any person unable to move quickly out of the direct blast of hot air, such as toddlers or immobile, elderly, or handicapped people.

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How is gastroenteritis treated?

A recent survey[1] of prescribing for children stated that, "The management, in general practice, of diarrhoea and vomiting needs improvement." We therefore examined the preadmission treatment of children with gastroenteritis admitted to our isolation unit, which serves the Maidstone and Medway health districts. These have a population of 490 000 and about 220 general practitioners.

Patients, methods, and results

We reviewed the case notes of 181 children admitted over an eight-month period in 1979-80; these represented 15% of medical admissions to the paediatric unit. Any preadmission treatment was recorded, together with the severity and outcome of the illness. In hospital all patients were given either an oral glucose electrolyte mixture (Dioralyte, Armour Pharmaceuticals Ltd) or, if more severely dehydrated, intravenous fluids; no drugs were given after admission.

Eighty-one children were aged less than 1 year. Ninety had been given drugs—54 antidiarrhoeal drugs, 41 antiemetics, and 39 antibiotics. Twenty-four had been given two drugs and four three drugs. The parents of 14 of the children said that they had been advised to stop solids and give fluids only; none of the children had been prescribed a glucose electrolyte mixture. Intravenous fluids were needed for 30 patients (17%); of these 19 had been given one or more drugs at home. Fifty (29%) were well enough to be discharged within 24 hours, and 24 of these had been given drugs at home.

Pathogenic bacteria were isolated from the faeces of seven patients: there were two cases of *Campylobacter jejuni*, and one each of *Escherichia coli* 044; *Salmonella typhimurium*, *S virchow*, *S hayder*, and *shigella sonnei*.

One child, aged 22 months, was severely dehydrated and died a few hours after admission. He had been ill for three days and had been treated with Lomotil (diphenoxylate and atropine). No pathogenic bacteria were isolated from faeces or blood cultures.

Comment

Antidiarrhoeal drugs, prescribed for 30% of our patients, do no good and are potentially harmful. Kaolin may facilitate the penetration of the intestinal mucosa by viruses while opiates and Lomotil delay the passage of liquid stools. This encourages the proliferation of pathogens and may lead to an underestimate of the severity of the diarrhoea.[2] The greatest danger of Lomotil, however, is respiratory depression and the drug is one of the commonest causes of fatal poisoning in childhood.[3]

Antiemetics, prescribed for 23% of patients, are largely ineffective against vomiting due to gastroenteritis; both prochlorperazine (Stemetil) and metoclopramide (Maxolon, Primperan) may cause extrapyramidal disturbances[4] that are often misdiagnosed as meningitis, encephalitis, or even tetanus and may lead to unnecessary lumbar puncture.

In this country most gastroenteritis is due to virus infections—in our study only 4% of patients had pathogenic bacteria—yet antibiotics were prescribed for 22% of these children. Furthermore, in bacterial gastroenteritis antibiotics do not lessen the severity or duration of symptoms and they may prolong the period of symptomless carriage and excretion of salmonellae and shigellae.[2] Thrush and prolonged diarrhoea are common complications of antibiotic treatment; a rare but often lethal one is pseudomembranous colitis.

The essential requirement in the management of gastroenteritis is the maintenance of fluid balance; without this other treatments are useless. If oral rehydration is insufficient intravenous fluids are needed; drugs do no good, have dangerous side effects, and may distract attention from the giving of fluids. Demands from parents for "medicine" may be satisfied safely by prescribing a proprietary glucose electrolyte mixture, such as Dioralyte. Gastroenteritis is common and it has been argued that the cases admitted to hospital are a small and "different" group who fail to respond to treatment. The children in our survey were presumably the most seriously ill of those seen by their family doctors yet 83% quickly recovered on oral fluids.

While we cannot be certain, it seems likely that our findings give a fair indication of the usual treatment of gastroenteritis in general practice; there is indeed room for improvement.

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CUCUMBERS. There is no dispute to be made, but that they are under the dominion of the Moon, though they are so much cried out against for their coldness, and if they were but one degree colder they would be poison. The best of Galenists hold them to be cold and moist in the second degree, and then not so hot as either lettuce or purslain: They are excellently good for a hot stomach, and hot liver; the unmeasurable use of them fills the body full of raw humours, and so indeed the unmeasurable use of any thing else doth harm. The face being washed with their juice, cleanses the skin, and is excellently good for hot rheums in the eyes; the seed is excellently good to provoke urine, and cleanses the passages thereof when they are stopped: there is not a better remedy for ulcers in the bladder growing, than Cucumbers are; The usual course is, to use the seeds in emulsions, as they make almond milk; but a far better way (in my opinion) is this; When the season of the year is, Take the Cucumbers and bruise them well, and distil the water from them, and let such as are troubled with ulcers in the bladder drink no other drink. The face being washed with the same water, cures the reddest face that is; it is also excellently good for sun-burning, freckles, and morphew. (Nicholas Culpeper (1616-54) *The Complete Herbal*, 1850.)

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