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SHORT REPORTS

Causalgia as a complication of meningococcal meningitis

We report this case for three reasons. Firsly, as a reminder that a normal cerebrospinal fluid does not exclude meningococcal infection; secondly, to report causalgia as a complication of meningococcal meningitis; and, thirdly, as an example of the efficacy of guanethidine blocks in the management of causalgia.

Case report

A 19 year old student, who had developed a cramp like pain in both calves two days previously, was admitted with a sore throat, headache, and fever. On admission his temperature was 39·2°C. He had a widespread macular rash and mild neck stiffness. Cerebrospinal fluid pressure measured at lumbar puncture was 21 cm H_2O, with a total protein concentration of 0·44 g/l, and glucose concentration of 4·4 mmol/l (79·3 mg/100 ml). Microscopic examination showed 25 red blood cells and five lymphocytes; no organisms were seen. He was treated with intravenous penicillin. Blood cultures and cerebrospinal fluid which had been taken on admission grew *Neisseria meningitidis*. He improved rapidly but complained of increasing burning pain in his left foot and lower leg associated with paraesthesiae. The pain, which was over the lateral aspect of his calf and foot, was not exacerbated by coughing or performing Kernig's manoeuvre and was accompanied by a deep pain in his calf. He had decreased power of dorsiflection and plantarflexion at the left ankle, and the left ankle jerk was absent. There was hypersensitivity to light touch and pinprick over the lateral aspect of the left foot. The rest of his neurological examination was normal. Eight days after admission his cerebrospinal fluid had a protein concentration of 1·78 g/l, a normal glucose concentration, and a polymorphonuclear leucocytosis. It was sterile. A radiograph showed osteoporosis of the bones of the left foot. A lumbar myelogram and computed tomogram of the head were normal. Electromyographic studies of the left leg showed denervation of the left gastrogenemius and tiberalis anterior muscles.

During the next three weeks the pain increased. All the muscles in his left foot became wasted and the skin over the foot was vasodilated and sweated excessively. He was treated with five guanethidine blocks using the method described by Hannington-Kiff,[1] and the pain decreased progressively after each block. The technique is similar to that of a Bier's block except that guanethidine rather than lignocaine is used. Seven weeks after admission he was discharged, no longer requiring analgesia and with only a slight limp.

Comment

This case is a reminder that in early meningococcal infection the cerebrospinal fluid may be normal biochemically and cytologically despite the presence of the organism.

In bacterial meningitis the spinal cord is rarely affected; we found reports of only four cases, two of which occurred before antibiotics were available.[2-4] Our patient had weakness in the distribution of L5 and S1 with electromyographic evidence of denervation, but the exact site of the lesion is uncertain.

Hyperpathia was described by Loh and Nathan[5] as a burning pain resulting from any stimulus, which radiates from the stimulus and lasts an abnormally long time. The area of abnormal sensation characteristically spreads beyond the original territory and is associated with a deep pain, increased sweating and vasodilatation, and a good response to guanethidine blocks, as in our patient. The underlying mechanism behind the efficacy of guanethidine blockade in the management of patients with causalgia is disputed,[5] but it probably operates by modifying the large afferent input to the spinal cord.

We thank Dr P Verril and Dr G M Stern for their advice and permission to report this case.

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Clinical and financial implications of a district scheme to provide plastic insulin syringes to diabetics

Despite the manufacturers' instructions to discard plastic insulin syringes after single use, multiple reuse is safe and acceptable to patients.[1,2] If multiple use of plastic syringes can be ensured they cost less than glass syringes. In March 1983 the change to U100 insulin in the United Kingdom provided an opportunity to offer plastic syringes to patients instead of glass ones, to encourage their reuse, and to evaluate costs, problems, and patient preferences. The Southampton district accepted this policy in anticipation that it would be cost effective.

Methods and results

A doctor and state registered nurse gave detailed instruction in the use of U100 insulin at a special clinic. Sixty Becton-Dickinson 0·5 ml or 1·0 ml plastic syringes were supplied for the first year for all patients except those who requested glass replacements. It was suggested that each syringe should be used for at least one week. Patients were instructed before injection to clean the skin with soapy water and tissue rather than surgical spirit, which by transfer on the fingers to the plastic syringes causes the markings to rub off. Despite the fact that the plastic syringes used contained no "dead space," the insulin dosage was not reduced and there were no appreciable problems in diabetic control as a result of this policy.[3]

The issue of syringes was recorded by the pharmacy staff so that patients could subsequently obtain further annual supplies, which were recorded on a central register in the hospital pharmacy. Those patients unable to reuse the syringes as recommended were encouraged to purchase further supplies from retail chemists to supplement the annual hospital issues. One year after the changeover began the patients were sent a questionnaire. Their responses were coded and the statistical analysis performed on an ICL 2970 computer with the SPSS package.[4]

Patient details

	All patients	Patients changing from glass to plastic syringes	Patients already using plastic syringes	Patients continuing to use glass syringes
No (%)	630	451 (71·6)	151 (24·0)	28 (4·4)
Mean age (years) (range)	49 (15-91)	50 (15-91)	47 (16-86)	46 (19-77)
Mean duration of diabetes (years) (range)	15 (1-55)	16 (1-54)	11 (1-55)	20 (1-48)
Sex (No (%)):				
Male	340 (54)	254 (56)	66 (44)	20* (70)
Female	290 (46)	197 (44)	85 (56)	8 (30)
No (%) of injections/day				
1	203 (32)	150 (33)	45 (30)	8 (28·5)
2	424 (67)	300 (66)	104 (69)	20 (71·5)
3	3	1	2	

*Significantly more men in this group compared with other groups ($p=0·006$).

A total of 865 patients were circulated and 630 (72%) replied. Some 28 (4%) had continued to use glass syringes, 151 (24%) had used plastic syringes before the changeover, and 451 (72%) had chosen plastic syringes for the first time; 548 (87%) thought that administration of insulin was easier with U100 insulin (table). Glass syringes lasted a mean of 10 months, equivalent to an annual usage of 1·21 syringes. The needles used with them lasted a mean of 31·8 injections (steel) and 9·9 injections (disposable). Some 406 (90%) patients using plastic syringes preferred them and used them for an average of 14·2 injections. No patient reported infection at the injection site. The most common reasons for discarding syringes were: blunting of the needle; bending of the needle; fading of markings; simple preference; hospital instructions; and hygiene.

Comment

This seems to be the largest reported survey of use of insulin syringes,[5] and the high response rate of 72% is sufficient for valid statistical analysis. We confirm the feasibility and safety of multiple reuse of plastic syringes. The number of glass syringes used annually (1·21) was similar to that reported in another large study (1·72).

Current district costs are £6·67 for a glass syringe and non-disposable needle, compared with 9·5p for a Becton-Dickinson plastic syringe. This gives an annual cost for patients having twice daily injections of £12·91 with glass syringes and £4·72 with plastic syringes and for patients having once daily injections £10·49 and £2·36, respectively. By reusing plastic syringes a calculated minimum saving of £7000 a year has been made in the Southampton district, not including savings from not providing spare glass syringes, carrying cases, industrial spirit, and cotton wool. Reuse of plastic syringes as described could provide savings of over £0·5 million a year for the United Kingdom as a whole.

Issuing plastic syringes on the drug tariff through a hospital pharmacy could ensure the safe and economical reuse of syringes. There is no sound basis for continuing to advise single use of plastic insulin syringes.

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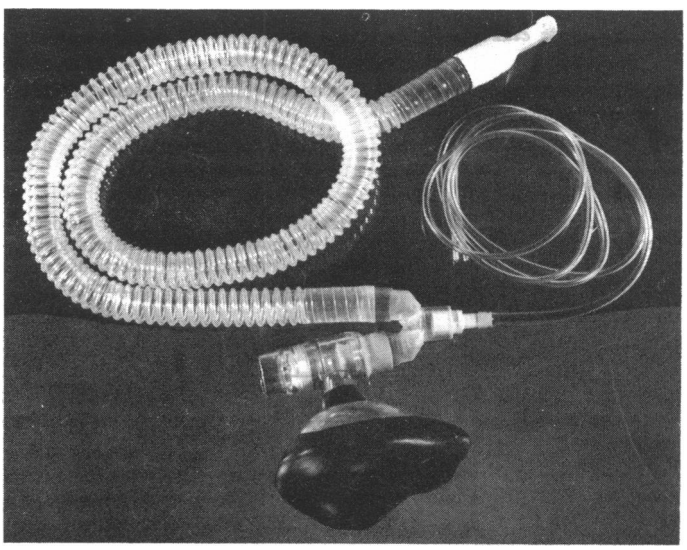
A new resuscitation apparatus providing 70% oxygen

Mouth to mouth ventilation is still the most simple first line resuscitation manoeuvre recommended to the non-anaesthetist.[1] Any proposed improvement on this technique must be straightforward and foolproof. We report on the performance of a simple apparatus that allows oxygen to be administered during both spontaneous and "expired air powered" ventilation. It also overcomes some of the problems inherent in other methods of resuscitation.

The apparatus

The apparatus (figure) consists of an Ambu E valve that may be attached to any facemask with a 22 mm socket or to any endotracheal tube connector of 15 mm taper. The expiratory port has a 30 mm taper, which will not connect to any of the other components. A Y piece (Siemens, 66 05 729 E037E) and a flexible, corrugated 1·5 m tube (Hudson, 1417) provide a 500 ml oxygen reservoir, with a terminal 22 mm taper, on to which fits a disposable mouthpiece (Ohmeda, 332555). The oxygen connecting tube (Argyle, 8888-230409) fits onto a 15 mm



The new resuscitation apparatus.

endotracheal tube connector (Portex, 100/252/080) and is an essential part of the system. It has a high resistance to gas flow, which ensures that satisfactory ventilation is maintained even if it is not connected to (or becomes disconnected from) a supply of oxygen. All joints except those to the Ambu valve and mouthpiece are permanently bonded together by cyanoacrylic adhesive (Loctite 406).

Laboratory evaluation—End tidal carbon dioxide pressure and mean oxygen concentration at the mouth were measured using a Datex Normocap (CD102/02) carbon dioxide and oxygen analyser. Healthy volunteers ventilated spontaneously through the apparatus at 12 breaths per minute, to an end tidal carbon dioxide pressure of 33-40 mm Hg. With oxygen flows of 2, 6, and 10 l/min mean oxygen concentrations at the mouth were 34·6%, 69·3%. and 80·5%, respectively, after two minutes.

Clinical evaluation—Seventeen patients (10 male and seven female) aged between 3 and 79 were studied during general anaesthesia. They were ventilated using the apparatus with an oxygen inflow of 10 l/min to an end tidal carbon dioxide pressure of between 30 and 42 mm Hg. The mean oxygen concentration at the mouth was 80·6% (range 72-94%) after two minutes.

Comment

The self inflating bag with non-rebreathing valve, facemask, and oropharyngeal airway is traditionally used to provide high oxygen concentrations during resuscitation. Competence in the use of this equipment is, however, low. Unfortunately, mouth to mouth ventilation is aesthetically objectionable and carries the risk of transmission of infection. Use of the oesophageal obturator airway has been shown to be associated with a high incidence of complications.[2]

Mouth to valve to mask ventilation frees both hands to hold the mask and maintain a clear airway.[3] The technique is readily mastered but does not ensure the delivery of a high concentration of oxygen.

The apparatus described here may be constructed easily using items