

- ⁴ Grimley Evans J, Prudham D, Wandless I. A prospective study of fractured proximal femur: incidence and outcome. *Public Health* 1979;**93**: 235-41.
- ⁵ Brocklehurst JC, Exton-Smith AN, Lempert Barber SN, Hunt LP, Palmer MK. Fracture of the femur in old age: a two-centre study of associated clinical factors and the cause of the fall. *Age Ageing* 1978;**7**: 7-15.

- ⁶ Baker MR. An investigation into secular trends in the incidence of femoral neck fracture using Hospital Activity Analysis. *Public Health* 1980;**94**: 368-74.
- ⁷ Office of Population Censuses and Surveys. *General household survey 1978*. London: HMSO, 1980.

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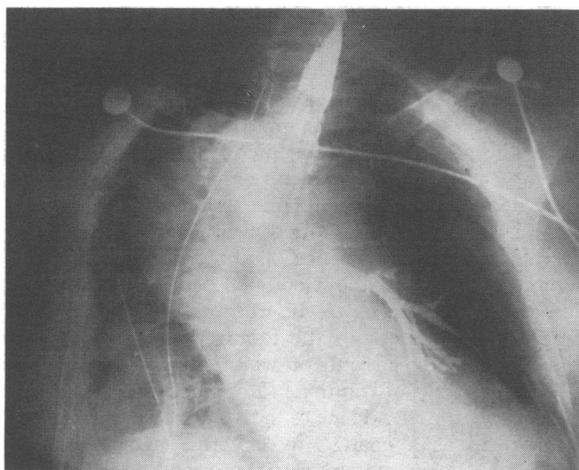
SHORT REPORTS

Aspiration around high-volume, low-pressure endotracheal cuff

Evidence suggests that low-pressure, high-volume endotracheal tube cuffs may permit leakage of material past them.^{1,2} Studies performed on dogs' tracheas and on glass tubes used as models of the human trachea showed that liquid passed around folds in the cuff.³ We report a case in which material tracked around the folds in a high-volume, low-pressure cuff that was properly inflated.

Case report

A 65-year-old man had undergone resection of the middle third of his oesophagus because of carcinoma; his condition deteriorated after the operation and he was admitted to the intensive therapy unit, where he was intubated with a 9 mm Mallinckrodt Hi-Lo oral endotracheal tube and intermittent positive-pressure ventilation was started using a Cape ventilator. The next day he was placed in the sitting position and barium was inserted into his upper oesophagus to test oesophageal anastomosis. A chest x-ray film showed that barium had spilled over into the oropharynx and tracked around the folds of the inflated cuff into the trachea and left main bronchus (figure).



Aspiration around a low-pressure, high-volume cuff.

The cuff pressure had been checked routinely and was 18 cm water, which is within the recommended range; there was no audible leak during the inspiratory phase of ventilation. The peak inspiratory pressure was 24 cm water and the expiratory pressure atmospheric. The patient himself was making no inspiratory effort.

Comment

The advantages of high-volume, low-pressure cuffs over low-volume, high-pressure cuffs are well established.^{4,5} In the intensive therapy unit at this hospital low-pressure, high-volume cuffs are used exclusively. Patients are clearly at risk, however, if material is allowed to collect in the oropharynx. Frequent sucking out to maintain a clear oropharynx is essential. Our case serves as evidence that material may track around the folds of a cuff which is being maintained at a pressure that is assumed to be safe. We would agree with Bernhard *et al*² that a

compromise may be needed, so instead of using the lowest inflation pressure at which no leak can be detected audibly a pressure of 25 cm water should be used routinely. This pressure will confer the benefits of low-pressure, high-volume cuffs but the possibility of aspiration will be reduced.

- ¹ Routh G, Hanning CD, Ledingham IM. Pressure on the tracheal mucosa from cuffed tubes. *Br Med J* 1979;**i**:1425.
- ² Bernhard WN, Cottrell JE, Sivakumaran C, Patel K, Yost L, Turndorf H. Adjustment of intracuff pressure to prevent aspiration. *Anesthesiology* 1979;**50**:363-6.
- ³ Pavlin EG, Van Nimwegan D, Hornbein TF. Failure of a high compliance low pressure cuff to prevent aspiration. *Anesthesiology* 1975;**42**:216-9.
- ⁴ Leigh JM, Maynard JP. Pressure on the tracheal mucosa from cuffed tubes. *Br Med J* 1979;**i**:1173-4.
- ⁵ Dobrin P, Canfield T. Cuffed endotracheal tubes, mucosal pressures and tracheal wall blood flow. *Am J Surg* 1977;**133**:563-8.

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Laburnum "poisoning"

Occasionally there are alarming accounts in the press or on the radio or television to the effect that a small child has eaten laburnum seeds and been rushed as an emergency to hospital, presumably in dire danger. The outcome is seldom heard. Understandably, the laburnum has come to be regarded toxicologically as an ogre, and representations are often made to have such trees felled and destroyed wherever children are likely to come into contact with them.

What is the authority for this view? According to *British poisonous plants*,¹ an invaluable bulletin issued by the Ministry of Agriculture, Fisheries, and Food, "After the yew tree, the laburnum is the most poisonous tree grown in Britain; all parts of it are toxic, the wood, bark and roots being consistently so throughout the year. . . ." The bulletin goes on to declare that, "Numerous cases are recorded of laburnum poisoning of human beings who have eaten the flowers or seeds, or who have carried twigs or bunches of flowers in their mouths. The features are dilatation of the pupils, stomach pains, vomiting, giddiness, weakness, coldness of the limbs, incoordination, and death from asphyxia." Lampe and Fagerstrom² give an even more horrifying clinical description. Thus it was only to be expected that the National Poisons Information Service should annotate its index accordingly and prepare for the worst whenever a call was received about this plant. We investigated the outcome of suspected laburnum poisoning in children in 1979.

Patients, methods, and results

During 1979 all inquiries received from doctors about suspected laburnum poisoning were carefully recorded and followed up. Among 49 cases, comprising 20 children under 5 years and 29 aged from 5 to 12, no symptoms were found in 34. Among the remainder the symptoms were nausea and vomiting (12 cases), abdominal pain (seven), sore mouth (three), drowsiness (two), delirium (two), and diarrhoea (one). The duration of symptoms was

up to five hours in five cases, five to 12 hours in one, 12-24 hours in one, and unspecified in eight. Sixteen of the children did not have to be admitted to hospital. Eight were admitted for up to five hours, 11 for five to 12 hours, 12 for 12-24 hours, and one for over 24 hours; in one duration of admission was not specified. Twelve children were not given any treatment at all, two required only fluids, 31 were dosed with ipecacuanha (despite vomiting), four received gastric lavage, and three were given purgatives.

The conclusion to be drawn from these data is that, among these children, laburnum by no means behaved viciously, no one came to serious harm, and no more than modest treatment had to be vouchsafed. Indeed, as a generalisation, overtreatment might be suspected.

Comment

There are few reports of the clinical picture after ingestion of laburnum, though Richards and Stephens³ described a fatal outcome in a patient with advanced schizophrenia who was found at necropsy to have ingested more than 23 pods of laburnum, from which it was confirmed by analysis that he had adsorbed a minimum of 35 mg of cytosine, with 50 mg being the more likely figure.

Little published information is available on the alkaloid cytosine, which is accepted as the toxic component of laburnum. Pharmacologically it is said to resemble nicotine in its action, and the lethal dose has been estimated at about 0.5 mg/kg. The seeds are said to contain about 1% (by weight) of cytosine. If this is so 3-4 g of them might constitute a fatal quantity for an adult, with correspondingly less for a child. This would not amount to many seeds. Given the inaccuracies of anecdotal evidence, the children in our series had consumed from one to 10 seeds, though higher figures were quoted in two cases, and from one to five pods. Questions thus arise whether these children in fact ingested far less than was asserted, or even none at all; whether the cytosine content is not as high as is averred, or varies between one specimen and another; and whether cytosine is, after all, not as toxic as it is made out to be ("probably the fastest-acting poison in common use, being as fast or faster than hydrocyanic acid and much faster than any metal cyanide"³).

In everyday practice laburnum does not behave as ferociously as a poison among children taking it accidentally as is generally thought. Summary figures from the National Poisons Information Service for years other than 1979 show the same pattern of relative innocuity.

¹ Forsyth AA. *British poisonous plants*. Ministry of Agriculture, Fisheries and Food. London: HMSO, 1968.

² Lampe KF, Fagerstrom R. *Plant toxicity and dermatitis, a manual for physicians*. Baltimore: Williams and Wilkins, 1968.

³ Richards HGH, Stephens AA. Fatal case of laburnum seed poisoning. *Med Sci Law* 1970;10:260-6.

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Intravenous feeding to sustain pregnancy in patient with Crohn's disease

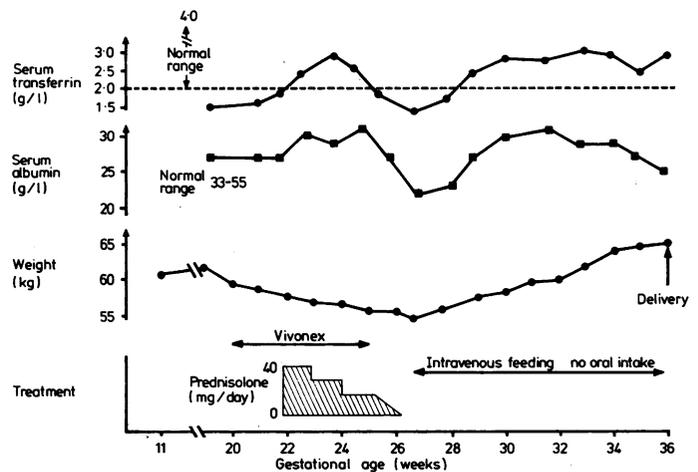
Total intravenous nutrition has been used in pregnancy for short periods for the management of hyperemesis gravidarum and severe eclampsia¹ and to maintain fetoplacental function just before delivery.² It has rarely been required for longer periods to sustain pregnancy.^{3,4}

Case report

A 27-year-old woman with Crohn's disease causing narrowing of the terminal ileum and ulceration of the proximal colon was admitted to hospital with vomiting and severe colic due to partial obstruction of the terminal ileum. Her symptoms settled with conservative treatment. One month later she became pregnant and her weight increased satisfactorily from 57.0 to 60.5 kg during the first 11 weeks. As the pregnancy proceeded colic, abdominal distension, and vomiting recurred and became progressively worse. From the 11th to 19th weeks of gestation she gained only 1 kg. Surgical resection was considered when she started to lose weight but was

rejected because of the risk to the fetus and she was again managed conservatively.

The figure shows the patient's subsequent progress. A low-residue elemental diet (Vivonex) with additional energy (Caloreen) administered through a fine-bore nasogastric tube achieved a daily intake of 15.1 MJ (3600 kcal) and 18 g nitrogen with some success. After two weeks vomiting



Progress and treatment during pregnancy.

and abdominal pain recurred and did not improve despite corticosteroid treatment. Tube feeding was abandoned after five weeks. She was therefore fed intravenously from week 27 by means of a central venous cannula. She received 11.8 MJ (2800 kcal) non-protein energy daily, 4.2 MJ (1000 kcal) from 20% fat emulsion (Intralipid) and the remainder from glucose; 14 g nitrogen from amino-acid solution with electrolytes (Synthamin); and 7.5 mmol (300 mg) calcium, 100 μ mol (6.5 mg) zinc, trace metal, and vitamin supplements (Addamel, Solivito, and Vitlipid). Additional iron and folic acid were administered by mouth. With this regimen her weight, mid-arm skinfold thickness, and muscle circumference increased. Blood pressure was normal. Glucose and protein were not detected in urine. Serum concentrations of routine electrolytes, magnesium, zinc, and bilirubin were normal, as were alanine and aspartate transaminase activities. Serum calcium concentration adjusted for low albumin value was normal, and alkaline phosphatase activity rose slightly towards term.

Caesarean section was performed at 36 weeks when a fall in urinary oestriol excretion suggested fetoplacental insufficiency. A girl of 2400 g (expected 2800 g) was delivered and after a short period of endotracheal intubation progressed normally (Apgar score 9 at five minutes). She had reached normal motor development by nine months. The patient subsequently required resection of her terminal ileum and proximal colon.

Comment

Intravenous nutrition for seven weeks with successful outcome for both mother and child has only recently been reported in a patient with benign oesophageal stricture.⁴ Moreover, Webb³ used intravenous nutrition for four and a half weeks in a patient with widespread malignancy and bowel obstruction, with survival of the fetus but death of the mother. Our patient received intravenous nutrition for nine weeks, during which recommendations for the provision of nutrients in pregnancy⁵ were largely met. Successful protein synthesis was indicated by a positive nitrogen balance and rise in serum transferrin concentration.

Major complications of intravenous nutrition did not occur. Heller¹ recommended avoidance of fat emulsion in pregnancy because of the theoretical dangers of maternal ketonaemia, premature labour, and placental infarction due to fat emboli. Maternal ketonuria occurred only once during intravenous nutrition after a period of vomiting. Premature labour did not occur. There was biochemical evidence of fetoplacental insufficiency at 36 weeks and, though the fetus came to no harm as judged by subsequent development, the placenta was small (20th percentile) with some ischaemic necrosis of the villi. Fat emulsion did, however, provide essential fatty acids and its contribution to the energy supply permitted an infusion concentration of glucose low enough to prevent urinary loss. Total intravenous nutrition allowed pregnancy to proceed when otherwise unavoidable major abdominal surgery might have resulted in fetal death.

¹ Heller L. Parenteral nutrition in obstetrics and gynaecology. In: Greep JM, Soeters PB, Wesdorp RIC, et al, eds. *Current concepts in parenteral nutrition*. The Hague: Nijhoff Medical Division, 1977:179-86.