Anaesthesia, 1997, **52**, 261–264

CASE REPORT

Delayed upper airway obstruction A life-threatening complication of Dettol poisoning

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Summary

Dettol liquid is a commonly used household disinfectant and although it is labelled nonpoisonous, serious respiratory complications have been reported in up to 8% of cases of Dettol ingestion. We report a case in which the delayed onset of upper airway obstruction was treated with emergency awake, fibreoptic guided nasotracheal intubation. Based on information available in published cases and on our own experience, we suggest that patients who have ingested large volumes of Dettol, have a history of vomiting or unprotected lavage, or have evidence of ongoing oropharyngeal inflammation, are at high risk of this complication. They should be closely observed for at least 48 h after ingestion and the facilities and staff required for emergency airway management should be immediately available.

Keywords *Airway*; obstruction. *Complications*; poisoning. *Intubation*; nasotracheal; fibreoptic.

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Accepted: 29 September 1996

Dettol liquid is a commonly used household disinfectant which contains 4.8% chloroxylenol, 9% pine oil and 12% isopropyl alcohol. Central nervous system depression is caused by all three components of the liquid, while chloroxylenol has both skin sensitising effects and a corrosive action on mucous membranes [1–4]. Although labelled nonpoisonous, serious complications such as aspiration pneumonia, adult respiratory distress syndrome, respiratory depression and cardiopulmonary arrest have been reported in up to 8% of cases of Dettol poisoning [1]. We report a case of self-poisoning with Dettol in which the delayed onset of upper airway obstruction required emergency tracheal intubation.

Case history

A 65-year-old patient was admitted to the emergency department. She was comatose with rapid shallow breathing and intermittent gasping. A strong smell of Dettol was noted on her breath. Her blood pressure was 108/75 mmHg and her heart rate was 110 beats.min^{-1}. There were inspiratory crackles heard over the base of the right lung. An uneventful rapid sequence tracheal intubation using thiopentone 120 mg and suxamethonium 70 mg was performed to provide airway control. The pharynx and epiglottis were noted to be erythematous at laryngoscopy. Charcoal 50 g was administered via a nasogastric tube. In view of the uncertain history, computerised tomography and diagnostic lumbar puncture were performed. Blood was taken for a toxicology screen and to measure plasma electrolyte concentrations. The results were normal and the patient later confirmed that only Dettol ($\approx$ 300 ml) had been ingested. After admission to the intensive care unit her conscious level improved and her trachea was extubated after 18 h. Erythema of the anterior neck and chest were noted, her lips were slightly swollen and some superficial ulceration of the oropharyngeal mucosa was present. Scattered inspiratory crackles were audible over the base of the right lung and the chest radiograph revealed a patchy alveolar infiltrate in the region of the right lower lobe. She was well oxygenated and comfortable while breathing 40% oxygen by mask. There was no evidence of upper airway obstruction. Although stable, a decision to continue observation in the intensive

care unit was made in view of the evidence of chemical airway burns. Approximately 48 h after admission the patient developed hoarseness which was rapidly followed by stridor and respiratory distress. Nebulised adrenaline and 100% oxygen were administered. As her condition did not improve, awake fibreoptic guided nasotracheal intubation with a 7.0-mm internal diameter cuffed tracheal tube was performed. The vocal cords were seen to be swollen and small areas of ulceration were present in the supraglottic area. Pressure support ventilation was initiated at 10 cmH_2O with a positive end-expiratory pressure of 4 cmH_2O. A leak around the deflated tracheal tube cuff was detected after 36 h (72 h after admission) and fibreoptic examination revealed a marked reduction in supraglottic swelling. The patient's trachea was extubated and symptoms of airway obstruction did not recur. One week later multiple small ulcerations in the supraglottic area consistent with chemical burns were still present. The patient continued to complain of hoarseness and at repeat examination 1 month later granulation tissue over both arytenoid cartilages was noted. Both the hoarseness and granulation tissue have subsequently resolved spontaneously.

Discussion

Dettol is a commonly used household antiseptic which accounts for ≈10% of all ingested poisonings at this institution [5]. The labelling of Dettol as 'nonpoisonous' may lead to its potential dangers being underestimated. These were highlighted in a recent retrospective review which identified serious consequences in up to 10% of cases of Dettol poisoning [1]. Acute upper airway obstruction is a potentially lethal but rarely described complication. This case demonstrates two features of concern. The first is that the onset of obstruction can be delayed for up to 48 h and the second is that when it occurs it may progress so rapidly as to require urgent invasive airway management.

The delayed onset of obstruction results from worsening tissue inflammation and oedema over the first 24–48 h. This is in keeping with the natural history of acute mucosal inflammation and oedema which occurs with other caustic ingestion injuries [6]. Delayed presentation is particularly hazardous as the vigilance of medical staff may decline after this period unless a high index of suspicion is maintained.

Establishing a clear airway is the priority in the management of rapidly progressive upper airway obstruction. The availability of a flexible fibreoptic bronchoscope and a skilled operator allows a rapid, awake, atraumatic intubation and concurrent direct visual assessment of the upper airways. Although we believe fibreoptic intubation is the method of choice, there are many alternatives [7]. The technique chosen should reflect the equipment and personnel available.

Upper airway obstruction following Dettol poisoning is not common and factors which make its occurrence more likely are not known. In this and in two previously reported cases, the ingested dose (125 ml in a 22-month-old child [8] and 500 ml in a 65-year-old female reported as part of a series [1]) was much higher than the average reported dose of 150 ml [1]. This suggests that the potential for obstruction is dose related. Both reported cases had a history of vomiting or unprotected lavage and our patient showed evidence of aspiration suggesting some degree of regurgitation prior to admission. Regurgitation allows more contact between the ingested poison and the mucosa of the upper airway and therefore increases the risk of tissue damage. In both our case and in the one case in which the condition of the mucosa was mentioned, the mucosa was noted to be erythematous. There appear to be no other features common to these cases which might predict the occurrence of upper airway obstruction.

In view of the above we would suggest that patients who have ingested large volumes of Dettol, have a history of vomiting or unprotected lavage, or have evidence of ongoing oropharyngeal inflammation should be closely observed for at least 48 h. In addition, patients whose tracheas are intubated for reasons such as central nervous system depression or aspiration following Dettol ingestion should be carefully assessed for potential upper airway problems before tracheal extubation. The prevention of vomiting and the avoidance of gastric lavage would appear to be prudent. Dilutional therapy as advocated for the treatment of the ingestion of caustic agents may be considered as an alternative to lavage [9]. The importance of airway protection cannot be overstressed as almost all serious complications reported to have occurred after Dettol poisoning are related to upper airway complications or aspiration.

In conclusion, serious complications and even deaths have been reported after the ingestion of Dettol in volumes of 300 ml or more in adults and equivalent volumes in children [1, 8]. Delayed but rapidly progressive and life-threatening upper airway obstruction may complicate Dettol overdose. Although a high index of suspicion should always be maintained, certain patients may be at higher risk for this complication. These patients should be closely observed for at least 48 h after ingestion and the facilities and staff required for emergency airway management should be immediately available. We would warn attending staff not to be complacent in cases of Dettol poisoning even though the words nonpoisonous appear on the label. Removal of the words nonpoisonous from the label may be appropriate.

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CASE REPORT

Interscalene patient-controlled analgesia

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Summary

The case of a patient undergoing revision total shoulder replacement is described in which postoperative pain relief was provided by patient-controlled analgesia via a catheter inserted into the sheath of the brachial plexus by the interscalene approach.

Keywords *Anaesthesia, techniques, regional*; interscalene brachial plexus block. *Pain*; postoperative, patient-controlled analgesia.

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Accepted: 25 November 1996

The outcome of a postoperative pain management plan often falls short of its intended goals. Parenteral opioid administration, even by a patient-controlled analgesia (PCA) technique, is associated with a significant incidence of side-effects such as sedation, pruritus, urinary retention, nausea and vomiting. A technique based primarily on regional anaesthetic blockade can provide excellent analgesia but may be limited by the short postoperative duration. The continuous infusion of local anaesthetic via a fine catheter into the appropriate nerve trunk sheath avoids many of the complications of parenteral opioids but carries with it the risks both of failure due to inadequate dosage and of local anaesthetic toxicity as a result of overdosage [1]. The use of a PCA device connected to a catheter placed in a nerve trunk sheath would therefore appear to offer advantages over both opioid PCA and continuous infusion of local anaesthetics. We describe the use of this technique.

Case report

A 74-year-old woman was scheduled for a revision of her right total shoulder replacement. She was a fit patient weighing 65 kg, classifiable as ASA grade I and with an unremarkable past anaesthetic history. Routine monitoring was attached in the anaesthetic room and an intravenous cannula was inserted. Sedation during the placement of the interscalene catheter was provided by 10 mg bolus

injections of propofol. Using an aseptic technique, an 18G Braun Contiplex® catheter was placed in the brachial plexus sheath after its identification using a nerve stimulator (Braun Stimuplex®) by the interscalene approach described by Winnie [2]. Five centimetres of catheter were left within the sheath and the catheter was secured by a suture to the skin. After aspiration, 30 ml of plain bupivacaine 0.375% was injected down the catheter over 5 min.

General anaesthesia was induced with propofol. Muscle relaxation for tracheal intubation and controlled ventilation was provided by vecuronium and anaesthesia was maintained with isoflurane and 66% nitrous oxide in oxygen. Both surgery and anaesthesia were uneventful.

At the conclusion of surgery, a Baxter APII® peristaltic PCA pump was connected to the interscalene catheter. The pump was programmed to deliver a bolus of 8 ml of pain bupivacaine 0.25% with a 30-min lockout and no background infusion. This particular PCA device was chosen as it is able to differentiate between absolute obstruction to flow and the high resistance to flow associated with fluid delivery through fine catheters.

When reviewed 6 h after surgery, the patient was pain-free and had not used the PCA pump. When she was reviewed 24 h after surgery she had made three successful requests of the PCA pump. Her pain was well controlled but she reported some slight pain at the lower end of the shoulder incision. The solution in the PCA pump was reformulated so as to contain $2\,\mu g.ml^{-1}$ of fentanyl in plain bupivacaine 0.25%. All other settings remained unchanged. After this she remained pain-free for the remainder of the 4 days that the catheter was left in place. No other analgesic agents were used. She was able to co-operate fully with physiotherapy. An intravenous catheter remained *in situ* throughout this period. No complications were encountered.

Discussion

Continuous brachial plexus blockade was first described by Ansbro in 1946 [3]. Catheterisation of the interscalene brachial plexus sheath for infusion of bupivacaine has been described [4], as has continuous brachial plexus infusion of a bupivacaine and fentanyl mixture [5, 6]. We are not aware of a report of the concomitant use of a PCA device delivering drugs through an interscalene brachial plexus catheter. In this case, interscalene PCA provided excellent analgesia for a prolonged period and allowed patient co-operation with early postoperative physiotherapy. Although nerve trunk sheath catheterisation is not applicable to all surgical procedures, it is particularly suitable for painful procedures on the upper arm where analgesia can be provided with a single catheter placement. It should be noted that intravascular positioning or migration of the catheter is a possibility [1] and we recommend that patients undergoing this technique should be nursed in a situation where continuous observation is possible.

The addition of fentanyl to the bupivacaine solution was suggested by a recent report [6]. Although its use cannot yet be supported by a significant body of scientific evidence in the form of controlled trials, we are able to report a successful experience, albeit anecdotally.

Acknowledgment

We thank Baxter Ltd for the loan of the APII peristaltic PCA pump and for providing a representative to demonstrate its proper use to both anaesthetists and ward nurses.

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