Ipecacuanha induced emesis in the treatment of self-poisoned adults

G. GORDON

Accident and Emergency Department, Manor Hospital, Nuneaton, Warwickshire, England

SUMMARY

One hundred consecutive adult patients presenting to an Accident and Emergency Department following intentional self-poisoning were given 50 to 80 ml Paediatric Ipecacuanha Emetic Mixture BP as an emetic, together with two or three glasses of strong orange juice. A satisfactory emetic result was obtained in 99 patients. No toxic effects were noted in these patients, or in the one patient in whom emesis did not occur, and who subsequently refused gastric lavage.

The potential toxicity of Ipecacuanha Syrup itself is discussed, and attention drawn to the lower Emetine content of Paediatric Ipecacuanha Emetic Mixture (BP), rather than that of the formulations used in previously published reports. The use of Paediatric Ipecacuanha Emetic Mixture B.P. in adults is effective and safe in this dosage.

INTRODUCTION

The methods available for retrieval of poisoning agents from the stomach are gastric lavage and emesis. In the United Kingdom at the present time, gastric lavage is the method most commonly used in the treatment of adults. It is an unpleasant and time consuming procedure for both patient and staff, and it is not without risk (Matthew *et al.*, 1966), even in the hands of the experienced nursing staff who usually carry it out. Doubt still remains about its effectiveness (Goulding & Volans, 1977), and the basis for its use rests more on the occasional recovery of large quantities of drug, rather than verification of its routine efficiency by studies in man (Melman & Morelli, 1978).

Promoting emesis is non-invasive, utilizes a normal physiological mechanism, and is less time consuming for hospital staff. Ipecacuanha is the emetic of choice, and reports

Correspondence: Mr G. Gordon, Consultant in Accident and Emergency, Manor Hospital, Manor Court Avenue, Nuneaton, Warwickshire, England

of its effectiveness in inducing vomiting in adults vary from 88% (Ilett *et al.*, 1977) to 96% (Manoguerra & Krenzelok, 1978). An assessment of its effectiveness in removing ingested substances is more difficult to make. Objective and reliable assessment could only be made by means of controlled trials carried out using suitably amenable human volunteers. However, comparative studies in dogs suggest that emesis is more reliable than lavage (Arnold *et al.*, 1959; Abdallah & Tye, 1967). These results might be unreliable due to differences in anatomy and the variable effect of the Ipecac in the animal (Corby *et al.*, 1967). However, Boxer *et al.* (1969) compared gastric lavage followed by Ipecac induced vomiting, with induced vomiting followed by gastric lavage, and showed that induced vomiting was more effective than gastric lavage.

Ipecacuanha, for use as an emetic, is available in United States Pharmacopoeia (Ipecac Syrup USP), Australian Pharmaceutical Formulary (Ipecac Syrup APF) and British Pharmacopoeia (Paediatric Ipecacuanha Emetic Mixture BP) formulations. These are not identical. The alkaloid content varies between formulations and may vary even within each formulation. The emetine content of Paediatric Ipecacuanha Emetic Mixture (BP) currently available in the United Kingdom is significantly lower than that of the ipecac syrups generally referred to in the literature. This may in part explain why some confusion remains regarding the effective and safe dosage in adults.

Earlier series have reported the efficacy of initial doses of 30 ml Ipecac Syrup (USP) (Manoguerra & Krenzelok, 1978) and 15 ml Ipecac Syrup (USP and APF) (Ilett *et al.*, 1977). In this unit however, these dose regimes using Paediatric Ipecacuanha Emetic Mixture (BP) proved considerably less reliable in producing emesis than a larger initial dose of 50 ml followed by a further 30 ml if required. The aim of this study was to investigate the effectiveness and safety of Paediatric Ipecacuanha Emetic Mixture (BP) as an emetic in adults using this higher dose regime.

METHOD

Data were collected prospectively on one hundred consecutive patients over the age of 15 presenting to the Accident and Emergency Department following an episode of self-poisoning. Each patient was given an initial dose of 50 ml Paediatric Ipecacuanha Emetic Mixture (BP) with at least two glasses of strong, sweet orange juice. If emesis did not occur within 30 minutes, a further 30 ml with strong orange juice was given. Contra-indications for this treatment were:

- Impairment of consciousness.
- Poisoning due to corrosive fluids.
- Poisoning due to petroleum distillates.
- Poisoning due to iron.

For each patient the following information was recorded:

- Age.
- Time elapse since ingestion.
- Dose of Paediatric Ipecacuanha Emetic Mixture (BP) given.
- Time elapse before vomiting.
- Macroscopic content and volume of vomit.

The patients were observed for at least one hour in the Accident Department prior to either admission for further care or discharge home.

A satisfactory emetic result was recorded if the volume of vomit produced was not less than the volume of fluid administered.

RESULTS

Of one hundred adults (age range: 15 to 66 years) treated with Paediatric Ipecacuanha Emetic Mixture (BP), a satisfactory emetic result was obtained in 99 patients. No toxic effects due to Ipecacuanha were noted in these patients. One 64-year-old male patient who presented with a history of having taken alcohol, paracetamol and a number of unidentified tablets failed to vomit after 80 ml Paediatric Ipecacuanha Emetic Mixture (BP), and subsequently refused gastric lavage. No toxic effects were noted in this man, who was discharged after psychiatric assessment 36 hours after admission.

Eighty-three patients vomited within 35 minutes of administration of the emetic. Details of the time taken to achieve emesis are contained in Table 1. Seventy-five patients presented within 2 hours of self-poisoning. Tablets or tablet remnants were retrieved from 34 patients.

No tablets or remnants were retrieved from any patient when the time interval between ingestion and emesis was more than five hours.

Table 1 Time to emesis after administration of Ipecac Syrup B.P. in 99 patients

<i>Minutes</i>	<i>Dose</i>	<i>Number of patients</i>
0-30	50 ml	74
30-35 (within 5 minutes of 2nd dose)	80 ml	9
35-45 (5-15 minutes after 2nd dose)	80 ml	16
65 (35 minutes after 2nd dose)	80 ml	1

The drugs and poisons encountered were as follows: tranquillizers and hypnotics, 54 cases; anti-depressants, 6 cases; analgesics, 38 cases; anti-histamine, 1 case; miscellaneous drugs and chemicals, 21 cases.

More than one agent was involved in 56 cases, and alcohol was frequently an additional factor. Drugs with significant anti-emetic properties (prochlorperazine and promethazine hydrochloride) were involved in two patients, both of whom vomited

within 20 minutes of a single 50 ml dose of Paediatric Ipecacuanha emetic Mixture (BP).

DISCUSSION

Ipecac is very widely used as an emetic in children, and has proved remarkably safe from unwanted side effects. Despite its 'over the counter' availability in North America and Australia, only one fatality has been reported in over 12 years of its use (and abuse) as an emetic (King, 1980). This one case involved extreme overdosage with the self administration of 90–100 ml daily for a period of three months (Adler *et al.*, 1980)!

Ipecac syrup (USP) may have been a contributory factor in the death of a 19 month old child due to herniation of the stomach into the chest through a congenital defect in the diaphragm (Robertson, 1979). Such defects are extremely rare, and a careful review of this case concluded that the policy for use of Ipecac syrup (USP) in children should continue unchanged.

Ipecac is derived from the dried roots of *Cephaelis Ipecacuanha* and *Cephaelis Accuminata*, plants indigenous to Brazil and Central America which are also cultivated in India and Malaysia. The active ingredients are the alkaloids emetine and cephaeline. Both are locally irritant to the gastro-intestinal tract, and both have a central emetic action on the chemo-receptor trigger zone in the medulla (Allport, 1959; Borison & Wang, 1953; Eggleston & Hatcher, 1915). Weaver and Griffith (1969) distinguished between early and late phases of vomiting due to Ipecac, the early phase within 30 minutes being due to local irritation, and later vomiting being induced by the central effect following absorption.

Potential toxicity of ipecac syrup

Most adult patients given Ipecac Syrup correctly eliminate the majority of the emetic by vomiting (99% this series; 88% Ilett *et al.*, 1977, and 96% Manoguerra & Krenzelok, 1978). In practice therefore, its toxicity should be considered in relation to those patients who take more than 30 minutes to vomit, or, at worst, do not vomit at all and retain the emetic dose. In this series, the maximum dose was 80 ml Ipecac Syrup BP, containing 34.8 mg emetine and 69.6 mg cephaeline. On review of the literature, no report was found of associated toxic effects occurring after the administration of an appropriate dose of Ipecac Syrup, whether retained or not. One report does detail unsurprising toxic effects in the form of cardiac irregularities following the administration of 90 ml Ipecac Syrup (USP) to a 23-month-old child (MacLeod, 1963).

The cardiac toxicity of Ipecac is due to its emetine content (Goodman & Gillman, 1980). The toxicology of emetine has been extensively studied in relation to its use in the treatment of amoebiasis where the usual adult dose is 60 mg daily for up to 10 days or 1 mg/kg for 5 days (Goodman & Gillman, 1980). Most reports of toxicity in man have been concerned with fatal or severely intoxicated cases. Klatskin & Friedman (1948) studied the early toxic manifestations of emetine therapy in 93 adults receiving total

doses of between 65 mg and 1735 mg subcutaneously. Although absorbed more effectively by this route, no cardiovascular side effects or ECG changes occurred in any patients after a single 65 mg dose of emetine. It would therefore appear that the emetine content of 80 ml Ipecac Syrup BP (34.8 mg) is unlikely to cause significant cardiac toxicity if retained by the patient. In practice, the cephaeline content of Ipecac Syrup BP appears to be non-toxic. Although it has been used in the past as an emetic in its own right (Martindale, 1967), there is singularly little toxicological information available, but unlike emetine, it is not known to be cardiotoxic.

Isolated cases of protracted vomiting following the administration of Syrup of Ipecac are referred to in the literature (Manno & Manno, 1977; Miser & Robertson, 1978; King, 1980).

We have not encountered this problem, and a review of the literature reveals no case of protracted vomiting following the administration of an appropriate emetic dose.

CONCLUSION

Blake *et al.* (1978) and Proudfoot (1984) suggest that many patients are being unnecessarily subjected to gastric lavage, and make a plea for a more critical assessment of self-poisoned patients.

Whilst a more critical assessment is obviously desirable, in practice there is frequently a degree of uncertainty surrounding the time of ingestion, the quantity and the variety of poison taken. In these circumstances the Casualty Officer or admitting medical team will frequently opt for an attempt at drug retrieval.

Gastric lavage is labour intensive and time consuming; in a busy Accident and Emergency Department with a high trauma workload, it may frequently be delayed until experienced nursing staff can be spared from the care of the injured. Emesis induced by correctly administered Paediatric Ipecacuanha Emetic Mixture (BP) (adequate dose accompanied by adequate fluid) is safe, less traumatic for the patient, at least as effective as gastric lavage, considerably less time consuming for the Accident and Emergency staff, and can be administered within minutes of the patient being seen by the medical staff.

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