MEDICAL PRACTICE

*Occasional Review***Management of intractable hiccup**

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British Medical Journal, 1977, 2, 501-503**Summary**

A patient who developed hiccups after laparotomy was treated with numerous drugs with limited success. A left phrenic nerve crush was eventually successful. A review of published work showed that the drugs most likely to succeed were chlorpromazine and metoclopramide, and that phrenic nerve injection and crush should be considered if these failed.

Introduction

Most people have, at some time, experienced hiccups, and most doctors have been asked to treat them. For such a common ailment there have been few controlled studies so that individual remedies are based on the slimmest of evidence. Most bouts of hiccups are short-lived and self-limiting, making assessment of the efficacy of individual treatments difficult. Recent experience in managing a patient with intractable hiccups by numerous remedies and with varying success prompted this review in an attempt to assess the efficacy of various treatments.

Case report

A 34-year-old painter presented with small bowel obstruction. At laparotomy a vitello-intestinal duct remnant obstructing two loops of

ileum was divided and appendicectomy performed. Some 14 hours after operation, while a nasogastric tube was still in place, the patient began to hiccup at a rate of about eight a minute. Two years earlier, after highly selective vagotomy for chronic duodenal ulcer, he had also developed hiccups, which resolved spontaneously after 12 hours. This time the hiccups lasted with varying free intervals for some 20 days. His progress was further complicated on the 11th postoperative day by pneumococcal pneumonia that was treated with benzylpenicillin.

Investigations to try to elucidate the causes were unhelpful. Screening of the diaphragm showed that both sides were affected by the hiccup but the left predominantly. Electromyography showed activity in the diaphragm with each hiccup, but only normal respiratory activity in the intercostal muscles.

The treatment given is summarised in the accompanying table.

Review of previous work

English language reports on hiccup treatment were searched and a summary of the many treatments advocated follows.

CENTRALLY ACTING DRUGS

Chlorpromazine is much more effective in treating hiccups when given intravenously (iv) than intramuscularly (im), especially after a single iv bolus dose of 50 mg. Friedgood and Ripstein¹ claimed an 80% permanent cure and a 10% temporary effect in 50 patients with various medical and surgical diagnoses. Side effects were restricted to sedation, dermatitis in one patient, and transient postural hypotension. Serious side effects, such as shock,² and death³ have been reported after prolonged iv infusion for conditions other than hiccups. Several papers support the ineffectiveness of this drug when given by oral or im routes,⁴⁻⁷ although these concern few patients.

Phenytoin, 200 mg iv followed by 100 mg four times a day by mouth, has been used with variable success⁸⁻⁹ in patients with underlying cerebral disease.

Haloperidol, 5 mg three times a day, has been used successfully in "several" patients.¹⁰

Orphenadrine was successful in two patients in a dose of 60 mg im¹¹ and in two further patients given 100 mg by mouth.¹²

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Effect on hiccups of various drugs

Treatment	Dose	Effect on hiccups
Metoclopramide	10 mg im 6 hourly for 48 h	Nil
Chlorpromazine	50 mg im 6 hourly, then 2 hrly for 24 h	Drowsiness. Some diminution in intensity and frequency
Papaveretum	20 mg im 6 hourly—24 h	Nil
Methylamphetamine	10 mg iv twice	Tachycardia and excitement. Nil
Droperidol	10 mg im twice	Minimal
Orphenadrine	60 mg im twice	Nil
Quinidine	200 mg 4 times daily by mouth for 48 h	Nil
Phenytoin sodium	200 mg iv; 100 mg four times a day by mouth for 24 h	Nil
Atropine	1.2 mg iv	Nil
Diazepam	20 mg iv—intermittent positive-pressure ventilation for 5 min with 5% CO ₂ on one occasion	Abolished for about 90 mins
Nasopharyngeal catheter	Twice	Abolished for 10 min
Granulated sugar	2 teaspoonfuls	Nil
Chlorpromazine iv infusion	200 mg 4 hourly for 36 hrs	Drowsy and asleep. Extrapyramidal signs abolished
Hypnosis		Unsuccessful
Phrenic nerve	Infiltrated with 1% lignocaine	Right—nil, left—abolished for 2 h
Left phrenic crush		Restarted 6 h after operation. Stopped 36 h after operation. Mild recurrence for up to 2 h at a time

iv = intravenously. im = intramuscularly.

Methyl phenidate hydrochloride, 20 mg VI, was popular in the early 1960s¹³ but a controlled trial on 51 patients showed that 10 mg iv was no better than a saline placebo for hiccups during or immediately after general anaesthesia.¹⁴

Ketamine hydrochloride, 0.4 mg/kg iv, has been successfully used in two patients¹⁵ during general anaesthesia and in five patients postoperatively.¹⁶

Carbamazepine, 200 mg four times a day, was successful in one patient with underlying cerebral disease.¹⁷

Mephesisin, a centrally acting muscle relaxant, cured a patient of intractable hiccup 15 minutes after taking 1 mg.¹¹

PERIPHERALLY ACTING DRUGS

Metoclopramide, 10 mg by mouth four times a day, has been used with high success in patients with disease on one or other side of the diaphragm.^{6 18} The relapse rate, provided a 10-day course is given, is low. No attempt has been made to compare the efficacy of metoclopramide by different routes of administration. Like chlorpromazine, metoclopramide may cause extrapyramidal side effects, and these drugs should not be given simultaneously.

Atropine, as a parasympathetic blocking agent, is said to be effective in bolus doses of 1 mg iv¹⁹ though no supporting data are presented.

Edrophonium chloride, a parasympathomimetic, 10 mg iv has also treated hiccups associated with general anaesthesia successfully in eight patients.²⁰

Amphetamine, 30 mg by mouth daily over a week, was used successfully in two patients.²¹

Quinidine has been used because it renders the motor endplate insensitive to the action of acetylcholine. A dose of 200 mg four times a day succeeded in six out of nine patients and improved a further two,²² but such doses may cause cardiac side effects.

*Amylnitrate inhalation*²³ and *instillation of 1 ml ether into the nose*²⁴ or *ammonia into the pharynx*⁵ have been used for their local action on the nasal mucous membrane, but their effects were temporary.

Inhaling carbon dioxide was advocated by Hamilton Bailey²⁵ on the basis of success in five patients, but subsequent experience has been less enthusiastic. The effect is usually temporary, and most reports attest to its unreliability.^{6 7 9 22}

OTHER TREATMENTS

Granulated sugar, swallowed dry, was immediately successful in 19 out of 20 patients, not all of whom had intractable hiccups.²⁶ The mode

Protocol for treating hiccups.

of action is thought to be related to increased input to the afferent limb of the hiccup reflex, so counteracting the effects of the original stimulus.

Irritation of the pharynx by a nasopharyngeal catheter was described by Salem.^{27 28} A catheter is passed through the nose for 7.5 to 10 cm so that the tip lies in the pharynx at the level of C2. The tube is then oscillated rapidly for some 30 seconds. Salem achieved success in 148 out of 150 patients, although many of these were anaesthetised and needed repeated attempts.

Phrenic nerve—Direct attack on the phrenic nerve has been advocated, usually when all else has failed. Traction,²⁹ electrical stimulation,³⁰ injection with local anaesthetic,^{19 31 32} and crushing and avulsion^{33 34} have all had their advocates but numbers of patients treated have mostly been small.

Hypnosis—Success with hypnosis has been reported in three patients.^{7 35 36}

*Acupuncture*³⁷ is also reported to have an influence, but as with many other apparently beneficial effects, its role in Western medicine has yet to be firmly established.

Vagal blockade by carotid sinus massage or pressure over the eyeballs has been proposed but no data can be found to support its efficacy.

Finally, several folk remedies should be mentioned. These include sneezing induced with pepper or snuff, honey and vinegar, breath holding, rebreathing into a paper bag, drinking water while covering the ears tightly, drinking from the "wrong side" of a cup, sudden fright, and traction on the tongue.

Discussion

We have not tried to discuss the differing causes of hiccup,^{33 38} which in itself makes any assessment of treatment difficult. Most

papers dealing with treatment are unhelpful to the clinician seeking guidance for a plan of management. For this reason we have drawn up the following protocol based on our own observations and on our review of previous work:

Respiratory function tests should be performed before attempts to paralyse the phrenic nerve. The left side should be blocked with bupivacaine first to test the effect on hiccup and respiratory function. Left-sided diaphragmatic contraction is more distressing to the patient, and an attack on this side is usually successful.¹⁹ If it succeeds phrenic crush should be performed. If this fails the right phrenic nerve should be blocked and crushed, provided respiratory reserve is adequate. Hiccup may persist even after bilateral phrenic nerve crush, in which case muscle relaxation and positive-pressure ventilation with 5% carbon dioxide should be considered.

Hiccups may diminish in frequency over hours or days in response to treatment, rather than stopping immediately.³⁹ For this reason regular recording of the frequency and intensity of hiccup is essential in assessing the effect of any therapeutic agent.

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Contemporary Themes

An adolescent ward

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Summary

A ward has been set up for adolescents, who, being neither children nor adults, have special needs. It provides a pleasant and enthusiastic atmosphere that allows the patients to mix together socially and removes much of the fear of entering hospital. A mixture from different

specialties is important, but not more than 20% should be long-stay patients. Those needing intensive care or specialised investigations and those likely to be a disruptive influence are excluded. No serious sexual problems have been encountered.

Introduction

"In recent years it has become increasingly evident that adolescents have needs and problems sufficiently distinguishable from those on the one hand of children and on the other of adults to warrant consideration as a distinct group for health care provision."¹ Adolescence is a period of great emotional and biological change and the management of illness at this time of life has to take account of it.²

Purpose-built wards have been in use in the United States for several years to meet the special needs of the physically ill

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