Phenytoin for the prevention of motion sickness

Edi G Albert

Clinical question

A 43-year-old woman sought advice about the treatment of her sea-sickness. A sea-kayaking enthusiast, she suffers disturbing motion sickness in big seas. The usual remedies have either been ineffective or made her drowsy. A scuba-diving instructor recommended that she try taking phenytoin the night before going kayaking, and she wonders whether there is any evidence to support this recommendation.

Search question

The primary search question was "*Is phenytoin effective in the prevention of motion sickness?*" The ideal studies to answer this question would be randomised controlled trials comparing phenytoin with placebo or comparing phenytoin with other conventional therapies.

Search

I searched two online databases, *MEDLINE* and *SUMSearch*, combining the terms "motion sickness" and "phenytoin" and limiting the search to studies published in English. The MeSH term "motion sickness" covers a range of conditions, including sea-sickness and travel-sickness. I also searched the websites for two diving-related organisations: Divers Alert Network and Diving Medicine Online.

Summary of findings

Five original research articles on the use of phenytoin for motion sickness were identified. Diving Medicine Online had a review article on motion sickness that mentioned phenytoin.

The first of the five research articles[1] reported a laboratory-based placebo-controlled double-blind crossover study using simulated motion. The seven participants were given phenytoin at anticonvulsant levels. Phenytoin was found to be four times as effective as any other single agent in increasing tolerance to motion stress.

The second study[2] involved 15 seamen and/or divers who worked for the US National Aeronautics and Space Administration in both small-boat trials (lasting one hour) and operational sea travel (lasting two to four days). Phenytoin was given in loading doses in the 24 hours before the trials and then maintained at anticonvulsant levels through regular serum testing and titrated doses. The small-boat phase of the study, a double-blind trial of phenytoin versus placebo, showed a significant reduction in nausea levels ($P = 0.0172$). The operational sea-travel phase of the study again showed a convincing advantage of phenytoin over placebo.

The third study,[3] a small double-blind crossover study with nine participants, included sea travel as part of a series of exposures to rotational movement, again using the rapid-loading-dose approach to reach anticonvulsant plasma levels of phenytoin. Results showed that phenytoin effectively reduced motion sickness.

The fourth study[4] focused on the effects of phenytoin on cognition and performance. Participants ($n = 23$) were given phenytoin to anticonvulsant levels or placebo. Phenytoin did not cause degradation in function, although at higher serum levels (beyond those required for efficacy) participants did report a number of subjective side effects (eg, lightheadedness).

The fifth study,[5] with 35 participants, was a double-blind study comparing placebo with the use of a single 200 mg dose of phenytoin taken four hours before participants were spun round inside a rotating drum. While differences in the subjective scoring of symptoms were not significant, behavioural responses (vomiting, and request for early termination of the experiment) were significant ($P < 0.05$).

The review article on motion sickness in Diving Medicine Online[6] described phenytoin being used the night before a dive, but did not indicate the evidence for this practice.

Comment

There is evidence that phenytoin is effective in preventing motion sickness. The approach used in most of the studies — that of rapidly loading subjects up to anticonvulsant levels of phenytoin in the preceding 24 hours and monitoring plasma levels — is hardly applicable for practical purposes. The generalisability of these studies is also questionable, as all were small and used healthy adult males. Taking a 200 mg dose of phenytoin four hours before exposure is practical, and the results are promising but not conclusive. Further research is required to determine the lowest effective dose. Short-term use of low doses is unlikely to produce serious problems. However, the fact that phenytoin is known to interact with some commonly used medications should be taken into account if it is to be prescribed for preventing sea-sickness.

Outcome

The woman elected to try a single 200 mg dose of phenytoin four hours before going kayaking. This was considered the lowest dose that might prove effective, based on the available

evidence. To test for side effects, the woman accepted my advice to try the first tablet on a day when she wouldn't be engaging in hazardous activity. (I can't report whether she was satisfied with the result, as I haven't heard from her since — that's the trouble with fit, healthy people!)

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book reviews

Pocket-sized guide to COPD

COPD. Rapid reference. David Halpin. London: Mosby, 2001 (136 pp, $41.99). ISBN 0 7234 3268 6.

THE TREMENDOUS BURDEN of chronic obstructive pulmonary disease (COPD) is escalating worldwide, as the population ages. In Australia, it is the third leading cause of burden of disease, affecting around one in 10 people aged over 45 years.

We have recently seen the worldwide release of the Global Initiative for Chronic Obstructive Lung Disease (GOLD) guidelines on COPD management. The revised Australian and New Zealand guidelines for management of COPD and associated *COPD handbook* (based on GOLD) are due for release shortly. So, do we need yet another guide to COPD management? Well, in this case the answer is, resoundingly, yes!

This book is excellent — and given the previous mismatch between the importance of COPD in clinical practice and the availability of useful evidence-based texts on the subject, I would be pleased to see even more books like this one. It is a concise handbook on COPD that is part of the Mosby *Rapid reference* series offering doctors "easy access to the best information for effective patient care and management".

Pocket-sized and very easy to read, the book contains chapters on definition, epidemiology, pathophysiology, treatment, future developments and frequently asked questions. The information provided is evidence-based, up-to-date and includes appropriate references. Pagination is colour-coded in sections for easy reference and there are many useful tables and figures. A comprehensive discussion of how to perform spirometry testing is a notable feature. One of the very useful appendices contains addresses and websites for more detailed information about specific areas of interest.

This book would be a useful rapid reference guide for general practitioners, physicians and hospital medical officers alike.

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Disturbing body image

Disorders of body image. D J Castle, K A Phillips (editors). Petersfield, UK: Wrightson Biomedical, 2002 (xii+164pp, $99.95). ISBN 1 871816 47 5.

THE ISSUE OF DISORDERED body image is highly relevant to our narcissistic, image-obsessed culture and this makes a concise volume, with a careful selection of chapters dealing with various aspects of this topic, very timely.

The book offers the reader an examination of body image disturbances associated with various psychiatric diagnoses including eating disorders. There is also a comprehensive coverage of body dysmorphic disorder including cognitive behavioural therapy strategies in its management and psychoneuropharmacology.

The chapter on body image in childhood and adolescence is particularly interesting. Its sociocultural perspective extends to the changing shapes of Luke Skywalker and GI Joe dolls — apparently it is not only their muscles which have enlarged with the passage of time. As it was with Barbie, hyper-reality seems to be at work here, giving rise to conjecture about body image implications for the impressionable young in whom prepubertal anorexia nervosa is not only on the rise but is almost equally distributed between genders.

By way of contrast the chapter on eating disorders takes a biological tack, questioning the primacy of body image disturbance in eating disorders, looking at the neurobiology of its acquisition and the role of its serotonergic mechanisms. Other areas covered include related anthropology, neurology, cosmetic surgery and dermatological aspects, and an exploration of disgust and the self.

This compact and attractively presented publication will be of interest to psychiatrists, mental health workers, cosmetic surgeons, dermatologists and general practitioners who will all find it clinically relevant. It should also appeal to the educated lay person seeking a masterly overview of a fascinating subject area.

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motion sickness. 4. phenytoin prevention. 4. sickness. 1. motion. 1. phenytoin. 1. Similar Publications.Â Request Full Text Paper. Please type a message to the paper's authors to explain your need for the paper. Paper: Phenytoin for the prevention of motion sickness. To: Edi G Albert. From (Name): E-mail: Only shared with authors of paper. Please enter a personalized message to the authors. More detailed explanations for your need are more likely to get a response. Send Request. Load Form Load Form. Request PDF from Authors. We can help you find this article by emailing the authors directly. Follow us on Twitter to stay on top of the latest in scientific research. Press proceed to send the au About Motion Sickness. A disturbance of the inner ear that is caused by repeated motion. Drugs used to treat Motion Sickness. The following list of medications are in some way related to, or used in the treatment of this condition. Select drug class. All drug classes miscellaneous anxiolytics, sedatives and hypnotics (11) anticholinergics/antispasmodics (4) antihistamines (16) phenothiazine antiemetics (5) anticholinergic antiemetics (23) anticholinergic antiparkinson agents (11).Â Off-label. This medication may not be approved by the FDA for the treatment of this condition. Pregnancy Category. A. Adequate and well-controlled studies have failed to demonstrate a risk to the fetus in the first trimester of pregnancy (and there is no evidence of risk in later trimesters). B. Phenytoin (PHT), sold under the brand name Dilantin among others, is an anti-seizure medication. It is useful for the prevention of tonic-clonic seizures and focal seizures, but not absence seizures. The intravenous form, fosphenytoin, is used for status epilepticus that does not improve with benzodiazepines. It may also be used for certain heart arrhythmias or neuropathic pain. It can be taken intravenously or by mouth. The intravenous form generally begins working within 30 minutes and is effective Although the dominant theory concerning motion sickness involves sensory conflict, there are also 2 other theories that "emphasize one of these responses, but deny the importance of the others" (Flanagan et al, 2004). As each of these situations occurs in nearly all motion, the question then becomes, which one is the most important. Sensory conflict theoryÂ Knox GW, Woodward D, Chelen W, Ferguson R, Johnson L. Phenytoin for motion sickness: Clinical Evaluation. Laryngoscope 104: August, 1994, 935-. Kuiper, O. X., et al.Â Lee JA, Watson LA, Boothby G. Calcium antagonists in the prevention of motion sickness. Aviat Space Environ Med 1986:57:45-8. Marcus, D. A., J. M. Furman, et al. In a placebo-controlled double-blind crossover pilot study of acute Coriolis-induced motion sickness treatment/prevention in humans employing an anticonvulsant dose of phenytoin, a mean increase in tolerance to motion stress from 4.87 min (S.D. = 5.55) to 46.87 min (S.D. = 32.6) was obtained. This represents a greater than fourfold improvement in efficacy over any currently available single agent and is more than twice as effective as the scopolamine/dexadrine combination. There were none of the usual side effects of blurred vision, dizziness, dry mouth, or sedation.