



Anti-emetics in Pregnancy and Travel Sickness

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Abstract

The widespread use of anti-emetics is gradually increasing in this age of so-called social improvement and generalised travel. Their use is, however, more restricted than that of tranquillisers in the New World. Nowadays, we are much more drug conscious than half a century ago, but whether this is due to ourselves or to the ingenuity of our pharmacological experts in producing new drugs, it is hard to decide. There can be little doubt, however, that many factors in our modern existence are to be blamed, in some part at least for the increased incidence of vomiting in pregnancy, and also of motion sickness as a whole. As yet, the precise aetiological factors in vomiting of pregnancy have not been elucidated, but it will be useful in discussing therapy to have a knowledge of how the two abovementioned conditions are brought about.

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ANTI-EMETICS IN PREGNANCY AND TRAVEL SICKNESS

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The widespread use of anti-emetics is gradually increasing in this age of so-called social improvement and generalised travel. Their use is, however, more restricted than that of tranquillisers in the New World. Nowadays, we are much more drug conscious than half a century ago, but whether this is due to ourselves or to the ingenuity of our pharmacological experts in producing new drugs, it is hard to decide. There can be little doubt, however, that many factors in our modern existence are to be blamed, in some part at least, for the increased incidence of vomiting in pregnancy, and also of motion sickness as a whole. As yet, the precise aetiological factors in vomiting of pregnancy have not been elucidated, but it will be useful in discussing therapy to have a knowledge of how the two above-mentioned conditions are brought about.

Vomiting of Pregnancy

If vomiting itself has occurred since man's earliest existence, surely vomiting of pregnancy has occurred for even longer, but if we consider the current theories on its aetiology, it would appear that it is a product of civilisation and our method of existence. It is interesting to note that vomiting of pregnancy is unknown in the New Guinea islands. In other words, we can postulate that a socio-cultural factor is involved. Various theories have been suggested to account for vomiting of pregnancy. The *neurosis theory* is currently well favoured, but it seems that various other factors play a part in the production of vomiting. According to this theory, there is a rejection tendency on the part of the expectant mother, or a distorted attempt of the unconscious mind to get rid of the embryo—a tendency that is apparently quite compatible with a desire to have a child. The neurosis theory is substantiated by the fact that in many cases, treatment of the condition on psychological lines, or by mere admission to hospital has been successful. There can be little doubt that metabolic activity in the female is considerably altered during pregnancy, particularly during the early stages. It therefore seems reasonable to suppose that this could be due either to endocrine disturbances or to metabolic processes. During the early weeks of pregnancy, there are active changes in the endocrine system, and it has long been believed that in some way, a deficiency in the corpus luteum might produce vomiting. Extracts of the corpus luteum have, however, been given with indifferent results. Another suggested aspect of the *endocrine theory* has been that the excessive excretion of certain hormones during pregnancy is an indication of abnormal swelling of the anterior pituitary lobe, causing a sickness of cerebral origin. It has further been suggested that there is a temporary adrenal insufficiency, or that there is an allergic reaction from the endocrines, possibly due to the release of a substance from the implanted ovum. The previously well supported

theory of a toxin released from the placenta or foetus is no longer held. The system most affected by the metabolic changes of pregnancy is the carbohydrate system. The instability of liver glycogen metabolism leads to a deficiency when faced with hunger, and the demands of the growing foetus. The fast during the night leads to further depletion and consequently to mild ketosis, and nausea and vomiting result. The distaste for food often hinders replacement of the carbohydrate store, and this aggravates the ketosis. Morning sickness can, in this way, lead to the pernicious type, but a neurotic element is likely to be involved. The corrective measures which support this theory are a high carbohydrate intake, with free administration of fluids, and the injection of glucose if necessary. Mild sedation will produce helpful rest and quiet.

Typical vomiting of pregnancy is present in about 50% of all cases in the early months, and there are all grades to hyperemesis gravidarum. As soon as a patient suffering from morning sickness feels nausea, and vomits later in the day, she should be regarded as a mild case of hyperemesis, and treated accordingly. As in all good medicine, the first aim in treatment is to seek the cause of the disturbance and treat this condition. If, however, the precise aetiological factors involved are not easily recognisable, treatment is carried out on symptomatic lines. If necessary, fluid replacement or blood transfusion should be carried out, and also correction of electrolyte losses. Glucose infusions may also be helpful in vomiting of pregnancy. In the treatment of vomiting of pregnancy, adrenaline was first used about forty years ago as an anti-emetic, and its use has been reported again recently. It was believed to have a selective action on the cardiac and pyloric sphincters. No specific anti-emetic drugs may be singled out for use in vomiting of pregnancy. Of the antihistamine type, anthisan 100mg daily, and avomine 25mg daily, have been found equally effective, provided fluid loss is replaced and an adequate diet supplied. Due, however, to the vagueness in the aetiology of the condition, anti-emetics do not play a major therapeutic role in most cases.

Travel Sickness

Almost every normal individual is initially affected by motion sickness, but children below the age of two and the elderly are less susceptible. The literature which appeared on the subject prior to 1939 contained little factual information concerning this common disorder, but the one firm development had been the securing of evidence that the vestibular apparatus was essential in its production. Motion sickness is caused by frequent oscillatory movements of the body, and linear rather than angular acceleration is involved. Air sickness is due to linear acceleration in a vertical direction, i.e. a sudden rise or fall. This is similar in an elevator or a swing. The utricle of the otolith organ acts directly through the vomiting centre, causing the sequence of events leading to the act of vomiting. Sea-sickness also depends on the labyrinth, but is caused by the conflict of data. Visual information is normally the principal basis for orientation, data from the labyrinth and proprioceptive systems being interpreted in this light. Conflict therefore gives rise to an ill feeling, to dizziness and possibly headache. This is followed by sweating, and eventually nausea and vomiting occur. Susceptibility to sea-sickness can be reduced if the person is recumbent, and especially if the head is inclined backwards. In this position, the visual receptors and the utricular maculae in the labyrinth are removed from the plane of motion. The reason why infants do not suffer from motion sickness is that the labyrinth is as yet not functioning fully. A child who has suffered from infantile meningitis may have a functionless

labyrinthine, and deaf mutes, as a rule, are not subject to motion sickness because in them the labyrinthine is underdeveloped. The cerebellum also plays a part in producing motion sickness, as removal of the flocculonodular lobe suppresses motion sickness without disturbing the vomiting reflex.

Attempts have been made to discover the physiological and psychological peculiarities of an individual which determine his degree of susceptibility to motion sickness. It appears that there is a dependency on a rather specific constitutional capacity of the individual to respond to certain patterns of vestibular stimulation, and that this can be modified to some extent by extralabyrinthine influences. 95% of susceptible persons have been found capable of adaptation without resort to the use of anti-emetics. Airmen include a persistently significant number of unfortunate individuals, both cadets and experienced flying personnel, who suffer from air-sickness when undergoing training or on joining a new unit. However, the number of these sufferers decreases considerably with each successive flight. With regard to susceptibility, a person may be resistant to one type of motion sickness, but not to another. Adaptation to a swing does not reduce air sickness, for example, and a person may be safe in a small boat, but very uncomfortable in a larger craft. The capacity to adapt to motion is minimal or entirely absent in these highly susceptible individuals, who constitute between three and five per cent of the population, and it is this group which must turn to the anti-emetics for comfort. Drugs given by mouth when the sickness has begun may not, however, be absorbed, and the administration should therefore be begun before the onset of nausea. The presence of food tends to stimulate the atonic inert stomach, and nausea may be decreased by this alone without the use of anti-emetics. Thus, when drugs are not available to serve as prophylaxis of motion sickness, the recommendation by sailors to nibble dry biscuits or bread at frequent intervals has much to be said for it.

The drugs used in the prevention of motion sickness can be divided into three groups. Drugs such as amphetamine, ephedrine and caffeine stimulate the brain, while barbiturates, bromides and chlorbutol depress the central nervous system during the control of motion sickness. The third group of drugs are those having a specific action in motion sickness, such as the belladonna alkaloids, atropine, l-hyoscyamine and hyoscine. Hyoscine hydrobromide was put to great use on service personnel during World War II. A dose of 0.6 mg. given one hour before rough water was encountered protected half the susceptible persons, and a double dose was required to help three-quarters. The equivalent dose of the other alkaloids is 1.0 mg. More recently, a new series of drugs has been used, of the antihistamine type; these act by depressing the overstimulated labyrinthine structure of the inner ear. Dramamine, a compound of diphenhydramine and a theophylline derivative, and avomine, a similar compound which has promethazine as its antihistamine moiety are both popular, but they produce the side effect of drowsiness, and should not be used by drivers and air pilots. Hyoscine is more specific as it does not produce drowsiness in the dose required to prevent sea sickness. Chlorpromazine, although a valuable therapeutic weapon for the relief of symptomatic vomiting, has no real place in the prevention of motion sickness, and the same is true of the recently introduced promazine and perphenazine. Many antihistamines have been used prophylactically in travel sickness, but due to the variability of their actions and side effects, the perfect solution has not yet been obtained.