MANAGING PERSISTENT HICCUPS IN ADVANCED CANCER 1: PHYSIOLOGY

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This is the first in a two-part unit on persistent hiccups in advanced cancer. It discusses the incidence, causes, physiology and adverse effects of hiccups. Persistent hiccups are a rare occurrence in patients with advanced forms of cancer. However, when they do occur, they can have a significant impact on patients’ quality of life.

INTRODUCTION

Various definitions of hiccups can be found in the literature. A consensus is ‘the repeated, involuntary, spasmodic contraction of the diaphragm and inspiratory muscles followed by sudden closure of the glottis’ (Krakauer et al, 2005; Launois et al, 1993).

The sudden closure of the glottis results in the ‘hic’. This characteristic sound is likely to be the origin of the word ‘hiccup’ (Launois et al, 1993). The alternative word ‘hiccough’ probably originated from a misinterpretation of the second syllable as ‘cough’.

The medical term for hiccup – singultus – stems from the Latin word singult, which means catching one’s breath while sobbing (Thomas and Thomas, 2006).

Unlike coughing or sneezing, hiccups do not appear to serve any useful function. There is a suggestion that foetal hiccupping may help develop the respiratory tract in utero (Kahrilas and Shi, 1997). Fass et al (1997) suggested it is possible that hiccups may serve a protective function by preventing large food boluses from entering the gastrointestinal tract.

LEARNING OBJECTIVES

1. Know the medical conditions that are associated with persistent hiccups.
2. Understand the effect persistent hiccups may have on patients’ quality of life.

Despite the strong inspiratory effort, early glottic closure prevents large changes in lung volume – therefore the ventilatory effects of hiccup are minimal.

Where glottic closure is compromised (for example by the presence of a tracheostomy), more significant ventilatory effects may become apparent, such as hyperventilation and respiratory alkalosis (Newsom-Davis, 1970).

Hiccup bouts lasting up to 48 hours are considered acute. On rare occasions, episodes of hiccupping will be prolonged. They may be termed ‘persistent’ if they last for longer than 48 hours, and ‘intractable’ if they persist for more than a month (Krakauer et al, 2005; Bush and Griffin-Sobel, 2002). For the purposes of this unit, the term ‘persistent’ refers to any hiccup episode lasting over 48 hours.

For patients with advanced cancer, persistent hiccups can have a severe impact on their quality of life. Although stopping an episode of persistent hiccups can prove challenging for healthcare professionals, the benefits for patients can be significant.

INCIDENCE

The incidence of persistent hiccup in patients with advanced cancer is unknown but considered to be small (Twycross and Regnard, 1998). Out of 400 patients referred for palliative care, hiccups were reported as a symptom by 2% (Potter et al, 2003). A similar percentage of patients reported hiccups as a clinically important symptom in a survey of 1,000 consecutive consultations carried out by a palliative care service (Donnelly et al, 1995).

CAUSES

Transient bouts of hiccups may be the result of overeating, eating too quickly, drinking alcohol or carbonated beverages,

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<tr>
<th>TABLE 1. CAUSES OF PERSISTENT HICCUPS</th>
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<tbody>
<tr>
<td><strong>IATROGENIC</strong></td>
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<tr>
<td><strong>Drugs, for example:</strong> diazepam, dexamethasone, methylprednisolone, midazolam, megestrol acetate, morphine</td>
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<tr>
<td><strong>INTRA-THORACIC</strong></td>
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<td><strong>INTRA-ABDOMINAL</strong></td>
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<td><strong>CENTRAL NERVOUS SYSTEM</strong></td>
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<td><strong>PSYCHOGENIC</strong></td>
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24 NT 26 August 2008 Vol 104 No 34 www.nursingtimes.net
ingesting very hot or cold food, or related to episodes of excitement or stress (Hardy, 2003).

Over 100 causes of persistent hiccups have been identified, although the association between the apparent cause and effect may be unclear (Smith and Busracamwongs, 2003; Launois et al, 1993) – see Table 1 for details. For some patients, the underlying cause of persistent hiccups may not be established.

Although some of the causes are relatively common, persistent hiccups are rare. Kahrilas and Shi (1997) suggested there is a wide variation in hiccup susceptibility between individuals, and people who are exposed to multiple potential causes may be more susceptible (Launois et al, 1993).

Takiguchi et al (2002) noted that men are more likely to experience persistent hiccups than women.

In patients with advanced cancer, gastric distension is considered the most likely cause of this symptom (Hardy, 2003; Bush and Griffin-Sobel, 2002; Twycross and Wilcock, 2001).

**PHYSIOLOGY**

Numerous anatomical structures are involved in the mechanism of hiccups, including the epiglottis, larynx, oesophagus, stomach, diaphragm and the accessory muscles of respiration (Sarhill and Mahmoud, 2007).

The neural pathway is considered to be the hiccup reflex arc. Although not fully understood, the hiccup reflex arc is thought to comprise:

- An afferent limb – consisting of the sympathetic chain originating from T6–T12 and sensory branches of the phrenic and vagus nerves;
- A central link – a poorly defined location within the spinal cord between C3–C5 with probable connections to areas within the mid-brain and brainstem;
- An efferent limb – primarily the phrenic nerve plus motor neurons to the accessory muscles of respiration (Smith and Busracamwongs, 2003).

Regardless of the underlying cause, irritation of the diaphragm, phrenic or vagal nerves, or central irritation, can result in hiccups.

A rise in the partial pressure of carbon dioxide has been shown to reduce the frequency of hiccups, while having no effect on hiccup amplitude (Newsom-Davis, 1970). Therefore, the frequency and amplitude of hiccups are thought to be controlled independently.

As hiccups have a minimal effect on ventilation, and are often triggered by gastrointestinal stimuli, they tend to be considered as a gastrointestinal phenomenon rather than a respiratory reflex (Newsom-Davis, 1970).

**ADVERSE EFFECTS**

A transient episode of hiccups will pass largely unnoticed and, at worst, is a minor inconvenience.

However, persistent hiccups can be much more serious for some people and can affect eating, drinking, sleeping and talking. As a result, patients can become increasingly fatigued, anxious and depressed (Phillips, 2005). Any source of distress for patients will, in turn, be a source of distress for their families.

The consequences of persistent hiccups are partly determined by the duration of the attack and patients’ underlying health status (Launois et al, 1993). Patients with advanced cancer often present in a debilitated state and any additional stress factor can have a severe impact on their quality of life.

**KEY REFERENCES**


The full reference list for this unit is available in Portfolio Pages at nursingtimes.net

The consequences of persistent hiccups include the following:

- Disturbed sleep;
- Reduced oral intake;
- Interrupted speech;
- Pain;
- Reflux oesophagitis;
- Anxiety, fatigue, depression;
- Wound dehiscence (if recent abdominal or thoracic surgery).

However, the effect of persistent hiccups is subjective and, in order to provide support, it is vital to engage with patients to establish what impact the presence of hiccups is having on them (Phillips, 2005).

It should be borne in mind that if the hiccups are not actually troubling patients, then they should not unduly concern healthcare professionals.

Part 2, to be published in next week’s issue, examines the treatment of persistent hiccups.