

Prolonged hiccups following a single oral dose of prednisone

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TO THE EDITOR:

Hiccups are common in healthy people and are usually short-lived and transient. Episodes persisting over 48 hours are considered intractable. Although not life threatening, persistent hiccups may be significantly uncomfortable and may lead to respiratory distress. Even though the cause of most episodes usually remains undetermined, various associated conditions, including medications, have been identified [1].

A 56-year-old man was evaluated at our emergency department for intractable hiccups of 9 days duration starting 12 hours after taking a single 60 mg dose of prednisone for hoarseness. Hiccups impaired his ability to eat and sleep. His vital signs were normal and his physical examination was unremarkable, except for persistent hiccups at an interval of 8–12 per minute.

Routine blood tests and electrocardiogram were normal. Contrast-enhanced computed tomography of the head, chest,

and abdomen showed no abnormal findings. Valsalva maneuver, which was reported to terminate hiccups [2], failed. The patient was treated with 40 mg of esomeprazole and 150 mg of gabapentin orally with a complete resolution of hiccups.

Corticosteroids are used in the management of various conditions and predispose patients to different side effects. Most clinicians are familiar with the more common ones, such as hypertension, weight gain, and diabetes. Less frequent side effects may remain unrecognized.

Corticosteroid-induced persistent hiccups (CIPH) are a known, yet rare and probably under-recognized side effect. CIPH occur mostly after systemic corticosteroid administration (oral, intravenous, and intramuscular) [3,4], but may also develop after local administration, such as intra-articular injection [3]. CIPH episodes usually last between a few hours to less than a week [2-4].

Our patient had hiccups for 9 days after a single oral dose of prednisone, which is apparently the longest CIPH duration caused by a single oral dose.

The mechanism of corticosteroid-induced hiccups is not fully understood. Earlier reports implicated local gastrointestinal tract stimulation [3]. A more recent suggestion is that both the afferent and efferent limbs of the hiccup reflex arch are steroid-sensitive [4].

Several non-pharmacologic techniques, such as carotid massage, hyperventilation, and the Valsalva maneuver

can decrease hiccups by stimulating the vagus nerve. Although these measures may be helpful in acute episodes, they are usually ineffective in persistent drug-induced hiccups [2]. In these cases, pharmacologic treatment might be required [2].

Chlorpromazine has been in use for over 60 years and remains the only medication approved by the U.S. Food and Drug Administration for hiccups. However, its adverse effects, such as hypotension and delirium, may be problematic. A recent review suggests treating hiccups with proton pump inhibitors, metoclopramide, baclofen, or gabapentin [4]. A similar combination of esomeprazole with gabapentin was effective in our patient.

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Capsule

Immunology antigen-induced wounding

Antigen recognition through the B cell receptor is essential for B cell activation and antibody responses. In vivo, B cells interact with antigens that are often associated with the surface of pathogens and antigen-presenting cells. Maeda and colleagues found that binding of antigen immobilized on beads or tethered to planar lipid bilayers wounded the plasma membrane of B cells. This wounding process involved B cell receptor polarization and required the motor activity of non-muscle myosin II, followed by plasma membrane repair mediated by lysosomal exocytosis and

release of acid sphingomyelinase. The resulting ceramide colocalized with the B cell receptor at antigen-binding sites and promoted sustained B cell receptor polarization, signaling, and antigen internalization. The extent of plasma membrane damage correlated with the efficiency of T cell presentation. Thus, plasma membrane wounding and lysosome-mediated repair enhance B cell receptor signaling and antigen presentation.

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