

Cough Syncope



To the Editor:

Although cough is a common clinical symptom, the vasomotor effects on the heart and systemic circulation are often underappreciated.

A healthy 42-year-old man without significant medical history presented with repetitive episodes of syncope during coughing. His examination, electrocardiogram, laboratory studies, and echocardiography results were normal, and carotid massage did not provoke any adverse response. During the hospitalization, the patient experienced new episodes of presyncope during coughing. Holter monitoring, at this time, documented transient episodes of complete atrioventricular block (Figure, note the presence of artefacts due to cough). In view of the presence of symptoms suggestive of pyrosis, a proton pump inhibitor and a prokinetic agent for gastroesophageal reflux were initiated. After one week of initiation of this treatment, there were no further episodes of cough or syncope, suggesting that the cough had been related to reflux.

The syndrome of cough syncope, also called “laryngeal ictus” (from Latin ictus, which means “blow, stroke, or thrust”) is characterized by paroxysmal cough, facial

congestion, cyanosis, and loss of consciousness, which typically occurs within seconds followed by rapid recovery. Cough syncope mostly occurs in middle-aged and older adults, or muscularly built men with a history of chronic obstructive lung disease. Cough syncope originally was thought to be a form of epilepsy, because patients often display jerking movements,¹ but several studies showed normal electroencephalograms during episodes.

Although the exact pathophysiology remains uncertain and debated, the hemodynamic theory seems to be the most established: the increase in intrathoracic pressure during coughing acutely lowers venous return and consequently cardiac output, leading to decreased cerebral perfusion and loss of consciousness. An abrupt reduction in blood flow velocity within the carotid arteries has been demonstrated by Doppler. Baroreflex activation leading to vagal response appears to be a key mechanism, although the relative roles played by vasodilation and bradycardia seem to be highly variable from patient to patient.² Asystole or complete atrioventricular block also has been reported during laryngeal ictus.^{3,4} The pathophysiology involved in these patients differs from carotid sinus hypersensitivity, and carotid massage provokes no cardiac pause in such subjects.⁵ An exaggerated vagal response to cough as the underlying

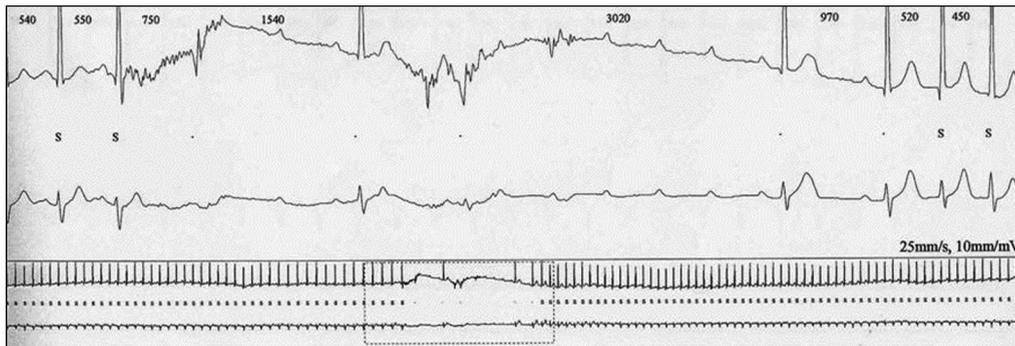


Figure Holter monitoring showing paroxysmal complete atrioventricular block during coughing.

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mechanism in the present patient was further confirmed by the absence of syncope during cough after atropine injection.

Although this case scenario highlights the possible deleterious effects of cough on systemic circulation, paradoxically, vigorous cough has been shown to improve hemodynamics, even producing higher arterial pressure than conventional cardiopulmonary resuscitation.⁶ The heart,

within the thoracic cavity, is subjected to rapid pressure changes during coughing, and it is postulated that this compressive force propels blood forward because of the presence of cardiac valves. Thus, some patients have been reported in cardiac catheterization laboratories in whom cough cardiopulmonary resuscitation in case of atrioventricular block, asystole, or ventricular tachyarrhythmias maintained consciousness for more than 30 seconds, with invasive arterial pressure monitoring.

The hemodynamic consequences of coughing are complex and variable. On the one hand, cough may allow transient maintenance of cardiac output in the extreme situation of cardiac arrest, and on the other hand, cough-induced syncope can present as a clinical problem. The exact determinants of the latter are uncertain, but reduced cerebral flow due to vagal modulation (a kind of laryngo-vagal reflex) seems to be the primary mechanism involved.

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