secondary to elevated pulmonary artery pressures in lieu of right heart catheterization data.

Assadollah Mocahed, M.D., F.C.C.P.; and
Juliette Wait, M.D., F.C.C.P.
Department of Medicine, Cardiology and Pulmonary Divisions, VA Medical Center, Hampton, Virginia and Eastern Virginia Medical School, Norfolk

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To the Editor:

We appreciate the comments of Movahed and Wait. They address an issue that we agree is not totally defined by our study.

First, we agree that minimal cardiac involvement by sarcoidosis cannot be ruled out. They correctly point out that a mildly enlarged ventricle may be missed. It would appear unlikely that poor systolic performance of the right ventricle with exercise would result from a myocardial process that did not cause some impairment of rest or exercise left ventricular systolic performance. In a clinicopathologic study of 26 cases of myocardial sarcoidosis,2 25 cases had involvement of the left ventricular wall with sarcoid granulomas, while only 12 had involvement of the right ventricle. We did not acquire our equilibrium radionuclide studies with sufficient temporal resolution1 to justify drawing conclusions about the diastolic function of the right and left ventricles. Therefore, the possibility that right ventricular dysfunction in some of our patients may have resulted from diastolic left ventricular dysfunction rather than pulmonary hypertension related to restrictive lung disease cannot be disproven by our study. The absence of an episode of clinical left heart failure, the absence of conduction system defects, and the absence of new rales or a left-sided heart failure gallop following exercise makes systolic right heart dysfunction secondary to isolated diastolic left ventricular dysfunction seem relatively unlikely.

It is not clear that analysis of the regional right ventricular ejection fraction during the second half of systole3 would have been of value in our study. The "second half" regional right ventricular ejection fraction has not been shown to be capable of separating right ventricular dysfunction related to pulmonary hypertension from right ventricular dysfunction due to other causes. In the study of Friedman,3 patients with regional segmental ventricular wall motion abnormalities (presumably related to coronary artery disease) and patients with tricuspid valve insufficiency were excluded.

Robert P. Baughman, M.D., F.C.C.P.;
Myron C. Gerson, M.D.; and
Carol H. Bokser, M.D.
University of Cincinnati Medical Center, Cincinnati

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Nicotine Overdose after a Single Piece of Nicotine Gum

To the Editor:

Nicotine chewing gum (Nicorette) has recently been introduced in this country to help patients stop smoking. According to the manufacturer, 2 mg of Nicorette gum produces blood levels equivalent to smoking half a cigarette per hour.

The cardiovascular effects of Nicorette gum in cigarette smokers are identical to those produced by placebo. Nicotine has sympathetic effects on the aortic and carotid body chemoreceptors, and stimulates the adrenal medulla to release catecholamines. No tolerance is developed to these latter effects. Nicotine may induce cardiac spasm and arrhythmias. Adverse reactions to nicotine in clinical trials have been minor. Most prominent are mouth, throat and jaw soreness related to gum chewing. Next in frequency are nausea, vomiting and nonspecific gastrointestinal distress, and infrequently noted are hiccups. The central nervous system effects are similar to those produced by placebo in habituated smokers. Nicorette gum is, therefore, considered a safe substitute for individuals who wish to stop smoking. We recently had the opportunity to care for a patient who developed signs and symptoms of nicotine overdose following a single piece of Nicorette gum.

CASE REPORT

This 23-year-old white woman was a two-pack per day cigarette smoker for several years. On the morning of March 24, 1984, she smoked one Marlboro cigarette. She had taken no medication on that day. At 1:30 pm, she bought and chewed a piece of Nicorette gum for approximately 60 seconds and then discarded it because of the taste and a tingling sensation in her mouth. For the next half hour, she felt slightly nauseated and noted that her hands were tremulous. She drank a glass of orange juice and felt better. Twenty minutes later, she became more nauseated and flushed. Her mouth felt dry and she experienced palpitations. There was a sensation of pins and needles and intense burning over her entire body, especially in her chest, groin, feet and hands. The patient started to sweat profusely and noted pruritis. She experienced vomiting and diarrhea and her palpitations continued. Her lips felt swollen "as if they were about to split open." She became disoriented and was taken to the hospital by her physician-father. She does not recall the ride to the hospital except that she experienced blurred vision and mental confusion. In the emergency room, she developed intense, unbearable abdominal pain. Her chest hurt and her mouth was dry.

On physical examination, her initial blood pressure was 86/50 mm Hg and her pulse rate 120 per minute. One day earlier, her blood pressure was 100/70 on routine examination. There was diffuse erythema over her entire body. The abdomen was soft, but the patient complained of intense abdominal pain. Bowel sounds were hyperactive.

She was treated with compazine, morphine and atropine with prompt resolution of her symptoms. After several hours, all signs and symptoms disappeared. She was discharged from the hospital without sequelae.

DISCUSSION

This patient had signs and symptoms of nicotine overdose after briefly chewing a single piece of Nicorette gum. She was a two-pack per day smoker and obviously had been exposed to nicotine.

The minimum lethal oral dose for nicotine in human adults is 40-60 mg. It is unclear why a 2 mg dose caused these effects. The manufacturer described a subject who participated in a clinical trial of Nicorette and developed nicotine intoxication requiring hospitalization for four days. However, it was not mentioned what dosage