

research is emphasized by the fact that widespread immunization in early childhood has not eliminated whooping cough, and that microbiologic laboratories, which have appropriately improved their techniques frequently, do isolate *B. pertussis* from clinical specimens. Control has not resulted from antimicrobial therapy. Some of my clinical findings and impressions about whooping cough may be of general interest and may stimulate others.

Whooping cough has been observed in persons in southern Ontario every year since I began practice in 1946, and there has been a periodic increase in incidence every 4 or 5 years. The most recent epidemic started in 1974 and was studied in detail from May 1975 to the end of January 1976. *B. pertussis* was isolated in 168 of 384 patients aged from less than 2 years to more than 50 years, and therefore I have no hesitation in stating that whooping cough is an infectious disease in persons of all ages, and that adults and teenagers play an important role in transmission.

Many of my patients had been "adequately immunized" according to accepted schedules in earlier life, yet they became infected with *B. pertussis*. Reinfections were also observed. There does not appear to be a chronic carrier state of infection with *B. pertussis*.

The medical profession generally does not recognize that whooping cough is still a common infection, and that nurses, other hospital staff and patients whose infections have not been diagnosed may transmit the organism to others. Not only is whooping cough itself a serious infection, but also secondary infection with other respiratory pathogens such as *Hemophilus influenzae*, *Streptococcus pneumoniae*, group A hemolytic streptococci and *Mycoplasma pneumoniae* may supervene and increase the costs to the health care system.

I have found that the inoculation of a vaccine containing killed *B. pertussis* in the early stage of the disease seems to result in rapid improvement in many patients with whooping cough.

Studies on basic epidemiologic and immunologic aspects of the disease, including the respective roles of humoral, cell-mediated and other types

of immune mechanisms, are clearly warranted. Whooping cough, as with measles and rubella, is a preventable disease that is not yet being prevented.

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Poisoning by cantharides

To the editor: Poisoning by cantharides (dried Spanish fly) has had a long and colourful history, owing in part to its undeserved reputation as an aphrodisiac.¹ The toxic effects of cantharidin on the gastrointestinal and genitourinary tracts are well known,^{1,4} but the effects on the heart are not fully documented. We describe a case with electrocardiographic changes associated with cantharidin intoxication to call attention to its potential for cardiac toxicity.

An 18-year-old woman swallowed 1½ to 2 mL of wart remover (Cantharone) containing 0.7% cantharidin after an argument with her boyfriend. A short time later she noted a burning sensation in her mouth and throat, along with retrosternal discomfort and nausea.

At the time of admission to hospital her pulse was 116 beats/min and her blood pressure was 110/54 mm Hg. The oral mucosa was ulcerated and inflamed, and laryngoscopy and esophagoscopy showed vesicles and ulceration of the mucosa of the pharynx and esophagus.

The patient was treated with intravenous administration of hydrocortisone sodium succinate, 50 mg q6h, and ampicillin, 1000 mg q6h. She had an uncomplicated recovery over the next 10 days.

The urine at the time of admission had a specific gravity of 1.022, 0.06% albumin, 10 to 12 leukocytes and 70 to 80 erythrocytes per high power field with no casts; 3 days later it contained 204 erythrocytes per high power field, and further urinalysis gave normal results. Other laboratory results were

within normal limits initially and subsequently. Chest roentgenograms were normal.

Three representative electrocardiograms are shown in Fig. 1. At the time of admission sinus tachycardia and terminal T-wave inversion were seen in leads V₁ to V₄, isoelectric T-waves were seen in leads II, III and aVF, and a reduction in T-wave amplitude was observed in other leads. Several days later sinus bradycardia (heart rate 45 beats/min) and episodes of junctional escape rhythm were noted. Later T-wave inversion of -5 mV was evident in leads V₂ to V₄. The precordial T-wave abnormalities were resolving by the end of her hospitalization but the frontal plane T-axis was +90°.

Cantharides have been used medically since Greco-Roman times but are now prescribed only for application to the skin as a blistering agent in the treatment of digital warts. Myocardial damage from cantharidin intoxication after its ingestion is not well documented clinically,^{2,3} but the serial electrocardiographic findings in our case are consistent with those of myocardial damage. Hence, patients who ingest cantharidin require cardiac evaluation and follow-up.

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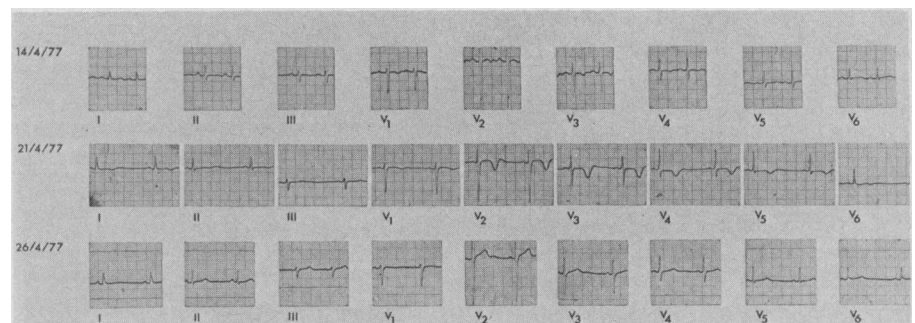


FIG. 1—Electrocardiograms shortly after admission (upper panel), 7 days later (middle panel) and 12 days later (lower panel).