Varicella control and vaccine coverage: issues and challenges

Background and epidemiology: Varicella zoster virus (VZV) is a DNA virus belonging to the herpesvirus family. It causes a primary illness commonly known as chickenpox and can also lie latent in the sensory nerve ganglia until it reactivates later in life and causes herpes zoster (shingles). The lifetime risk of VZV infection is about 95%,[1] with about 350 000 cases reported annually in Canada. Disease tracking is currently based on passive reporting from 6 provinces and 2 territories, and it likely underestimates the true incidence of infection by a factor of 5 or more.[2]

Most (90%) reported cases of VZV infection involve uncomplicated cases of chickenpox in children.[2] The uncomplicated disease, despite its benign course, carries an economic burden of about $109.2 million annually, with direct medical costs accounting for only about 10% of this; the largest cost driver is lost productivity caused by caregivers' lost work days.[3]

Severe complications such as superimposed skin infections (group A β-hemolytic streptococci), encephalitis and pneumonia develop in a small proportion of patients. The risk of severe complications from primary VZV infection is much higher in adults than in children. Adults account for only 5% of all annual cases, yet between 1987 and 1996 they represented about 70% of reported VZV-related deaths in Canada.[4] Maternal infection during the first 28 weeks of gestation can transmit VZV to the fetus and lead to congenital varicella syndrome.

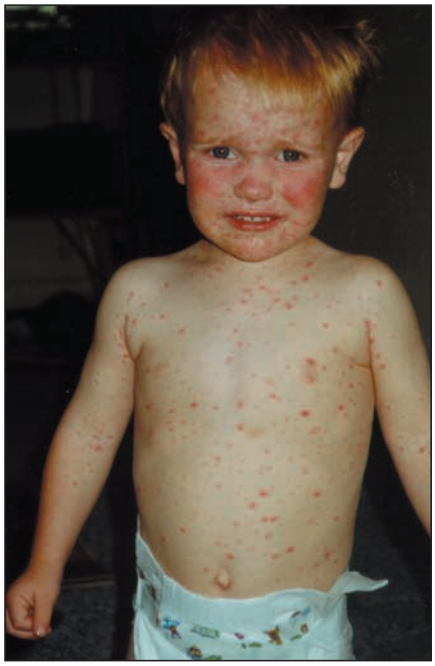
VZV infection, which is highly contagious, is spread by direct contact with skin lesions or oral secretions; airborne spread can also occur. Those infected are contagious from 1 to 2 days before the onset of rash up until the last lesion has crusted. The incubation period ranges from 10 to 21 days, and there may be prodromal symptoms such as fever, malaise and upper respiratory tract infection. The characteristic lesions appear in successive crops over the first 3 to 4 days and progress from macules to vesicles to pustules to crusted lesions.[4] The rash is generally centrally distributed, with lesions concentrated on the trunk, scalp and face.

Diagnosis can be made clinically by the characteristic rash and epidemiologic links such as known exposure to another patient.[1] The virus can be isolated from scrapings of the vesicle base during the first 3 to 4 days after the eruption as well as from a variety of serologic antibody tests. A significant increase in serum varicella IgG antibody can retrospectively confirm a diagnosis in immunocompetent people.[5]

Clinical management: The care given to otherwise healthy individuals who have an uncomplicated course of VZV infection is primarily supportive. Intravenous or oral therapy with acyclovir, valacyclovir, famciclovir or foscarnet can be given. The decision to use antiviral therapy, and the duration and route, will depend on a variety of specific host factors and the extent of infection.[5]

Prevention and control: Varicella is a notifiable disease. When treating a patient, physicians should follow the recommended precautions for airborne diseases in the infection control guidelines for the physician's office.[6] This includes quickly triaging such patients out of the common waiting area and, if possible, seeing them at the end of the day. Health care workers who are not immune to the disease should not enter the room, and routine housekeeping measures as outlined in section 4 of the guidelines should be followed.[6] Susceptible health care workers may also consider vaccination — the National Committee on Immunization[4] and the Canadian Task Force on Preventive Health Care[7] both recommend primary vaccination of healthy people over 12 months of age who are susceptible to the disease. People older than 13 years should receive 2 full doses at least 28 days apart.[1]

A live attenuated vaccine called the Oka strain was developed in Japan, in the early 1970s. Until June 2000 the only varicella vaccine licensed for use in Canada was highly heat sensitive, but it has been replaced with a vaccine that offers better stability at fridge temperature.



Varicella, an uncomfortable reality for most children, occasionally leads to more serious complications.

Despite the advent of a more stable vaccine, health care professionals do not universally accept routine administration of the varicella vaccine because it is unclear whether lifelong immunity will develop in children who are vaccinated. It is currently estimated that the vaccine offers about 70%–90% protection against VZV of any severity for at least 7 to 10 years, which is the observation period reported from recent studies.[1,8–11] If the protective effect wanes, a program of universal vaccination could cause a shift in the epidemiology of varicella to the adult population, with a resulting increase in morbidity.[3,12] This would put susceptible adults at increased risk of the disease at an age when significant complications are common.[12]

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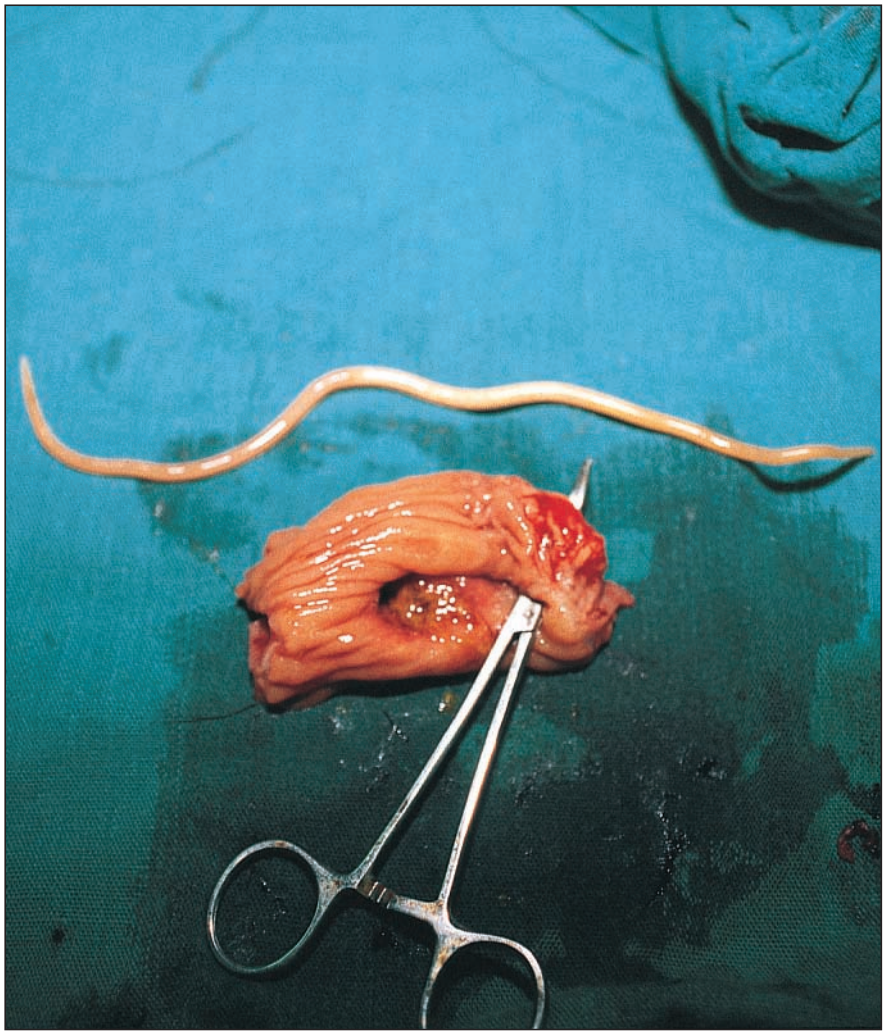
CLINICAL VISTAS

Generalized peritonitis

A 16-year-old girl who was 4 months pregnant was seen at a hospital in Kenya. She presented with a 3-day history of abdominal pain, nausea and vomiting. Examination revealed a visibly ill young woman with a somewhat distended and generally tender, silent abdomen; the size of the uterus was normal for the stage of gestation. The laboratory work and clinical picture were indicative of generalized peritonitis. At laparotomy the abdomen was filled with purulent fluid. The pelvic organs (aside from the 4-month pregnancy), stomach, duodenum and appendix were unremarkable. Examination of the small bowel revealed a perforated Meckel's diverticulum, which was resected. On opening the resected specimen, a neatly curled and viable ascaris (roundworm) was found within the diverticulum. The patient received broad-spectrum antibiotics and antihelminthic treatment and made an uneventful postoperative recovery.



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