

## MRSA: New twists from an old pathogen

A previously healthy three-year-old girl was admitted to hospital with a three-day fever and an enlarging abscess on her right buttock. On further questioning, her parents said that she had few 'small boils' that appeared during the summer months; they were located on her arms and resolved with a topical antibiotic cream. She was previously well, had received all her routinely recommended immunizations and had no previous hospitalizations.

Both her mother and father are well. Her healthy 12-year-old sister attended an international music camp for students the previous summer and had few skin abscesses several months previously, which responded to topical antibiotics.

On examination, she was not toxic-appearing, but she had a fever of 39°C. She was irritable and had an erythematous fluctuating mass on her right buttock measuring 3 cm by 4 cm, which was extremely tender. The surrounding skin over both buttock areas had multiple small lesions, which were red, round and had a central white core measuring 3 mm by 4 mm in size.

Her white blood cell count was 15,000. A surgeon concurred with the diagnosis of an abscess and advised an incision and drainage procedure, which was carried out. The bacterial cultures revealed methicillin-resistant *Staphylococcus aureus*. An oral trimethoprim-sulfamethoxazole was prescribed to her as an outpatient, and she improved considerably. Her parents wondered where she could have acquired this infection, and why she required an isolation room.

### LEARNING POINTS

- Staphylococcal infections can be due to methicillin-sensitive *S aureus* or methicillin-resistant *S aureus* (MRSA).
- MRSA can be divided into two categories: hospital-associated MRSA (HA-MRSA) or community-associated MRSA (CA-MRSA).
  - HA-MRSA became increasingly common as a hospital-associated pathogen in the 1990s in adults who had frequent contact with health care, chronic conditions such as cancer, long-term indwelling catheters or who were on hemodialysis.
  - ◊ HA-MRSA strains are typically resistant to many antibiotics, especially clindamycin and trimethoprim-sulfamethoxazole.
  - CA-MRSA isolates are genetically distinct from HA-MRSA and cause infections in persons who have not had contact with health care and have no known risk factors for hospital-associated infections. Recently, CA-MRSA has been seen in hospitalized patients.
  - ◊ CA-MRSA strains are usually susceptible to clindamycin and trimethoprim-sulfamethoxazole.
- CA-MRSA is an emerging infection that most commonly presents as skin and soft tissue infections, including:
  - Folliculitis, abscesses and boils with or without associated cellulitis and associated systemic features of severe sepsis.
  - Deeper infections that are associated with infections of the bone, muscle or fascia.
  - Necrotizing pneumonia with respiratory failure and associated sepsis. On occasion, these have occurred in patients who have been coinfecting with the influenza virus.
  - Sepsis syndromes, infected thrombophlebitis or other endovascular infections.
- Although many children have no known risk factors, paediatric CA-MRSA infections are seen more often in patients who participate in contact sports, use intravenous drugs or live in overcrowded conditions.
- Physicians can help prevent the spread of MRSA infections in health care institutions by:
  - isolating infected patients;
  - practicing scrupulous hand hygiene;
  - developing routine practices to prevent direct contact with any skin lesions; and
  - covering all draining wounds or skin lesions.
- The overall prevalence of MRSA is unknown in Canada.
  - Sporadic community disease has been seen anecdotally in all parts of Canada.
  - Clusters and outbreaks of CA-MRSA have occurred in Alberta, and in some communities in Manitoba and Saskatchewan.
  - Clusters have been reported in a child care centre and in neonatal intensive care units in Ontario.
- The extent, the risk factors and the burden of disease, particularly for hospitalized children, is not completely known in Canada. It is a notifiable disease only in Yukon. Some hospitals, mainly larger teaching centres, report cases through the Canadian Nosocomial Infection Surveillance Program.
- To determine the annual number of children requiring hospitalization due to newly diagnosed MRSA infections in Canada, the Canadian Paediatric Surveillance Program study began in September 2008 and will continue through to August 2010. The study is also designed to describe the clinical spectrum of severe MRSA infections, and an estimate of those with known potential risk factors.

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*The Canadian Paediatric Surveillance Program (CPSP) is a joint project of the Canadian Paediatric Society and the Public Health Agency of Canada, which undertakes the surveillance of rare diseases and conditions in children and youth. For more information, visit our Web site at <www.cps.ca/cpsp>.*