

Prevention of congenital rubella syndrome



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Rare cases of congenital rubella syndrome (CRS) continue to occur more than 30 years after the introduction of a rubella immunization program in Canada. This position statement updates the information previously published in 1999 (1).

HOW EFFECTIVE HAS THE RUBELLA VACCINATION PROGRAM BEEN?

Before rubella immunization, the majority of Canadians contracted rubella during childhood. The rubella vaccination program has been very effective, with there being fewer than 30 cases of rubella per year reported in Canada between 1998 and 2004 (2) compared with a mean of over 15,000 cases per year between 1941 and 1958. There were over 4000 cases reported in 1997, primarily in adolescent and young adult males in Manitoba, because boys were not included in the routine immunization program that was in place during their infancy. This is unlikely to recur because all routine infant rubella immunization programs in Canada have included both sexes since 1983. However, small epidemics continue to occur. There were over 300 cases of rubella reported in southwestern Ontario in 2005, primarily in communities opposed to immunization – a situation that is likely to recur (2).

HOW OFTEN DOES CRS OCCUR IN CANADA?

A total of 11 cases of CRS were reported to the Notifiable Diseases Reporting System between 1999 and 2004, with the cases being fairly evenly distributed over this five-year period. Reporting is thought to be almost complete based on cross-checking via the Immunization Monitoring Program ACTive, an active surveillance system that includes a network of 12 hospitals and 90% of the tertiary care beds in Canada (2), and the Canadian Paediatric Surveillance Program, which conducted active surveillance of CRS and identified nine cases between 1996 and 2004 inclusive. The incidence of abortions and stillbirths related to rubella in Canada is not known.

WHY DOES CRS CONTINUE TO OCCUR IN CANADA?

Rubella virus continues to be introduced into the community by travellers. Because of vaccine failure or failure to be immunized, some pregnant women are susceptible. Women may not be immunized because they are missed, refuse immunization or come from countries where the routine immunization program includes the monovalent measles vaccine rather than the measles-mumps-rubella (MMR) vaccine. A recent study (3) showed that 8.8% of women in Alberta were seronegative for rubella at the time of routine prenatal screening.

HOW COMMON IS VACCINE FAILURE AND DOES VACCINE FAILURE CONTRIBUTE TO CRS?

Although almost 100% of people immunized with rubella vaccine seroconvert, failure of one dose of rubella vaccine to protect against disease occurs in up to 10% of cases (4). Vaccine failure is predicted to be less common in the future now that the majority of Canadian children receive two doses of the MMR vaccine. Infection in a previously immune mother (secondary vaccine failure) is rare. A small number of cases of CRS have been described in infants born to women with primary or secondary vaccine failure or rubella reinfection (5).

CAN MORE BE DONE?

Yes, more can be done. There are missed opportunities to prevent CRS. The elimination of CRS not only depends on effective childhood immunization, but also on identification and immunization of susceptible women of childbearing age. Women with no documentation of either previous rubella immunization or rubella seropositivity should be screened during pregnancy and should receive one dose of rubella vaccine postpartum if susceptible. The utility of screening women who have received vaccine but have not had seropositivity documented and the utility of repeat doses of vaccine for women who remain seronegative have not been

established, and thus remain controversial (4). These practices are not recommended in the current Canadian Immunization Guide (6), but are part of some provincial programs. The immunization status of women of child-bearing age who are new to Canada needs to be consistently reviewed (5). Many will have received monovalent measles vaccine and, thus, remain susceptible to rubella. Unless women are already pregnant, or it is clear they have received a rubella-containing vaccine in the past or have documented immunity, they should be offered the MMR vaccine during their initial encounter with the health care system. Delaying immunization to determine their serostatus may result in a missed opportunity to immunize before pregnancy.

Ongoing surveillance for all cases of rubella and of CRS is a vital component of a prevention program. Patients with illnesses that are compatible with rubella or measles should have a serum rubella and measles immunoglobulin (Ig) M serology requested. In low-prevalence situations as seen for measles and rubella in Canada, in the absence of clear epidemiological links or travel history to endemic areas, IgM serology has a low positive predictive value for both measles and rubella. Thus, additional laboratory testing such as paired acute and convalescent IgG serology (to look for a fourfold or greater rise in titre) and/or virus detection is necessary to confirm measles and rubella infections. This is not only important for surveillance purposes, but is critical for the laboratory investigation of suspected rubella in pregnant women where important patient management decisions must be made. In this situation of suspected rubella in a pregnant woman, rubella IgG avidity testing has been shown to be a very useful laboratory test for differentiating primary infection (with a high risk of CRS) from past infection (low risk of CRS) (7). Infants with unexplained microcephaly, cataracts, glaucoma, pigmentary retinopathy, hearing impairment, patent ductus arteriosus, hepatosplenomegaly, thrombocytopenia or radiolucent bone densities should be evaluated for CRS with the appropriate investigations depending on the age of the child (4).

ARE THERE ANY COMPLICATIONS OF RUBELLA IMMUNIZATION OF SERONEGATIVE INDIVIDUALS, INCLUDING WOMEN IN THE POSTPARTUM PERIOD?

The frequency of true vaccine-related transient acute arthritis or arthralgia in nonimmune women is in the order of 5% to 10%, although a higher percentage will complain of arthralgias when warned of this potential adverse event. In contrast, acute and persistent forms of arthritis after natural rubella infection are more common, with up to 30% of naturally infected women experiencing recurrent joint manifestations for up to two years (8). There is no evidence of any increased risk of new-onset chronic arthropathies or neurological conditions in women receiving the rubella vaccine (9). No adverse events have been described from inadvertent immunization of women who are already immune to rubella or who are already pregnant, although it is still recommended that pregnancy be delayed for 28 days

following immunization. Because rubella vaccine is a live vaccine, it is contraindicated in persons with immunodeficiency.

RECOMMENDATIONS

To prevent CRS, the following recommendations should be followed:

- Continued universal infant immunization to protect recipients and to decrease circulation of the virus;
- Use of the MMR vaccine rather than the monovalent measles vaccine as the immunizing agent in all immunization programs for measles worldwide to expedite the elimination of rubella (4);
- Screening of all pregnant women to determine the need to confirm seropositivity and to enable postpartum immunization of all women found to be susceptible on prenatal screening. Standing orders on the postpartum ward should be implemented (similar to the RhoGam [Ortho-Clinical Diagnostics Inc, USA] standing order in the postpartum period) because they will expedite postpartum immunization. Breastfeeding is not a contraindication to immunization;
- Screening for immunity and vaccination, if necessary, of all health care personnel, including students in training;
- Immunizing all nonpregnant immigrant and refugee women at their first encounter with the Canadian health care system unless they have documentation of effective vaccination or natural immunity; and
- Fully investigating and reporting every case of possible rubella or CRS (4).

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