

response and survival compared with aminoglutethimide alone (R Murray, personal communication). Further studies are required, but we doubt whether combination endocrine treatment is likely to confer appreciable advantage in this disease.

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Clinically apparent rubella reinfection with a detectable rubella specific IgM response

Subclinical reinfection with rubella may occur, particularly if seroconversion has been induced by rubella vaccine.¹ Verified reinfections in which the patient has developed a rubelliform rash, however, have been reported infrequently. Traces of rubella specific IgM have been detected in reinfection in people with vaccine induced seroconversion after experimental challenge,² but there is only one report of its detection in a reinfection after seroconversion due to natural infection.³ Indeed, the absence of detectable rubella specific IgM has become accepted as a characteristic of rubella reinfection.⁴

We report a case of confirmed, clinically apparent rubella reinfection in an immunocompromised patient with presumed previous natural infection and in whom a rubella specific IgM response was detected.

Case report

A 19 year old woman was diagnosed as having acute lymphoblastic leukaemia in April 1982. Remission induction chemotherapy with standard agents achieved a complete remission by the fourth week. Central nervous system prophylaxis (radiotherapy and intrathecal methotrexate) for four weeks was followed by maintenance treatment.

Seven days after beginning maintenance treatment (22 July) she presented feeling generally unwell with aching limbs, episodes of shivering, and loose stools. She was feverish (39 C) and had conjunctival injection but no arthropathy or lymphadenopathy. Soon after admission a fine macular rash

appeared over her arms and back. The white cell count was $3.4 \times 10^9/l$ (neutrophils 20%, lymphocytes 66%, monocytes 14%). The illness was clinically diagnosed as rubella and questioning disclosed contact with a child with a rubelliform rash three weeks previously. The patient gave a serologically unconfirmed history of rubella as a child and denied having been vaccinated against rubella. The illness resolved within three days.

Sera collected in April 1982, on the day of admission, and at later intervals were available (table). The six sera were evaluated for rubella specific antibodies by haemagglutination inhibition, radial haemolysis, and IgM capture radioimmunoassay. The results showed a haemagglutination inhibition titre of 100 IU and a haemolytic zone of 12 mm for the serum collected in April. These values are accepted as indicative of previous primary rubella. Both of these assays showed a substantial, prompt rise in amount of detectable antibody at the onset of the illness. Antibody capture radioimmunoassay is a sensitive assay for rubella specific IgM,⁵ values exceeding 3.3 arbitrary units rarely being found without supporting evidence of recent rubella infection (personal observation). Rubella specific IgM was not detected in this patient's serum before her illness but a peak of 6.1 arbitrary units was found in the acute phase. The value declined over subsequent weeks. Rubella specific IgM was also detected by gel filtration and haemagglutination inhibition.

Comment

This patient's illness was clinically diagnosed as rubella and, though she was immunocompromised as a result of her chemotherapy and acute lymphoblastic leukaemia, it was symptomatically mild and of short duration. Even in immunocompromised patients, however, clinically apparent reinfections have been reported infrequently.

The other uncommon feature of the illness was the detection of rubella specific IgM using a sensitive quantitative assay. The detection of rubella specific IgM is established for reinfections in people with vaccine induced seroconversion but there is only one report of its occurrence in a reinfection in a person with natural seroconversion.³ In that report the patient also had a clinical illness and the diagnosis of a reinfection, rather than a primary infection, was based on the presence of rubella antibody detected by haemagglutination inhibition in a sample of serum taken before the illness. It is now accepted that haemagglutination inhibition titres may be due to residual non-specific inhibitors in the serum and not be indicative of rubella specific antibody. In our patient, preillness rubella specific antibody was detected by radial haemolysis in addition to haemagglutination inhibition.

Although our patient had disturbed immunological function, the results obtained do indicate that rubella specific IgM may be detectable in reinfections when previous seroconversion is due to natural infection. The amount of rubella specific IgM, however, was smaller than seen in primary infections.

¹ Horstmann DM, Liehaber H, Le Bouvier GL, Rosenberg DA, Halstead SB. Rubella: reinfection of vaccinated and naturally immune persons exposed in an epidemic. *N Engl J Med* 1970;**283**:771-8.

² Balfour HH Jr, Groth KE, Edelman CK, Amren DP, Best JM, Banatvala JE. Rubella viraemia and antibody responses after rubella vaccination and reimmunisation. *Lancet* 1981 *ii*:1078-80.

³ Strannegård Ö, Holm SE, Hermodsson S, Norrby R, Lycke E. Case of apparent reinfection with rubella. *Lancet* 1970 *ii*:240-1.

⁴ Craddock-Watson JE, Ridehalgh MKS, Anderson MJ, Pattison JR. Outcome of asymptomatic infection with rubella virus during pregnancy. *J Hyg (Lond)* 1981;**87**:147-54.

⁵ Mortimer PP, Tedder RS, Hambling MH, Shafi MS, Burkhardt F, Schilt U. Antibody capture radioimmunoassay for anti-rubella IgM. *J Hyg (Lond)* 1981;**86**:139-53.

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Results of evaluation for rubella specific antibodies in six samples of serum

	14 April	22 July	26 July	2 August	16 August	29 October
Radial haemolysis for rubella specific IgG (zone in mm)	12	15	17	17	17	17
Antibody capture radioimmunoassay for rubella specific IgM (arbitrary units)	1.0	6.1	5.6	5.0	4.0	2.9
Haemagglutination inhibition (IU)	100	800	800	800	800	800