

Booster Effect of Rubella Vaccination in College Students with Pre-existing Low Antibody Titers in Japan

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ABSTRACT. The object of this study was to clarify which titers are suitable for boosting immunity by rubella vaccination with the Matsuura strain. From among 435 college students, 76 students (mean age, 18.3 years old; range, 18 to 20 years old) who had rubella HI antibody titers of $\leq 1:32$ were enrolled in this study. After vaccination, we measured HI, ELISA-IgG and IgM titers and avidity. Among these students, who had pre-existing low antibody titers of 1:8, 1:16 and 1:32, 83%, 39% and 10% with the HI assay, and 83%, 50% and 33% with ELISA respectively, there was a significant increase in the titers. Immunity by vaccination could be boosted effectively in students with a pre-existing titer of 1:8. However, for women and high-risk people such as medical or educational workers or students, HI antibody titers $\leq 1:16$ would seem to be appropriate in Japan.

Key words ① rubella ② vaccination ③ booster effect

Although rubella is a relatively mild disease, rubella infection can lead to problems with congenital rubella syndrome (CRS) in the next generation due to fetal infection. Rubella and CRS are preventable with vaccination. In Japan, between 1977 and 1994, rubella vaccination was required for only female students in junior high school to prevent CRS. However, in 1995, regulations were changed to include all young children aged 12 to 90 months, both boys and girls, to prevent rubella epidemics. Since 2006, immunization of children between 12 to 23 months old and approximately six years old, before entry to elementary school, with an MR (measles and rubella combined) vaccine has become a requirement. And catch-up vaccination for adolescents aged 12 to 18 years old will start in 2008. However, we believe that a decrease in the number of adolescents and young adults susceptible to rubella in Japan is necessary to eliminate rubella and CRS, because approximately 3.5 million are still susceptible among people aged 15 to 30 years old¹⁾. In 2004, a research group supported by the national government recommended that women without antibody against rubella or with low antibody titers determined after measuring rubella antibody at antenatal screening, which is usually implemented in Japan, should be vaccinated to decrease the risk of CRS²⁾. In other words, not only women with a negative antibody of $<1:8$ as determined by the hemagglutination inhibition (HI) assay, but also women with low titers of $\leq 1:16$ should be vaccinated to prevent CRS due to infection or reinfection during pregnancy. Rubella reinfection during pregnancy, however, is rarely associated with CRS³⁾⁻⁶⁾. There have been few reports about the criteria for preventing reinfection. The purpose of this study was to

