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Measles in an incompletely-vaccinated child

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A 7 year-old boy was admitted to King Chulalongkorn Memorial Hospital because of fever, rhinorrhea, cough and skin rashes 4 days prior to admission. Conjunctival injection, maculopapular rashes and Koplik's spots were found on physical examination. He received one dose of MMR when he was 9 months old. Diagnosis of measles was confirmed by serology test. The report emphasizes the importance of two doses of measles vaccination at the age of 9-12 months and 4-6 years.

Keywords : *Measles, Measles vaccine.*

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ผู้ป่วยเด็กชายอายุ 7 ปี มาโรงพยาบาลจุฬาลงกรณ์ด้วยอาการ ไข้ น้ำมูกไหล ไอ และผื่นขึ้น 4 วันก่อนมาโรงพยาบาล ตรวจร่างกายพบตาแดง มีผื่น maculopapular ทั้งตัว และ Koplik's spot ที่กระพุ้งแก้ม ผู้ป่วยมีประวัติได้รับวัคซีนหัด-หัดเยอรมัน-คางทูม เมื่ออายุ 9 เดือนเพียงครั้งเดียว ได้รับการวินิจฉัยเป็นโรคหัดซึ่งได้รับการยืนยันจากการตรวจทางซีโรโลยี รายงานนี้เน้นให้เห็นความสำคัญของการฉีดวัคซีนป้องกันโรคหัด 2 ครั้งที่อายุ 9-12 เดือนและ 4-6 ปี

คำสำคัญ : *หัด, วัคซีนป้องกันโรคหัด*

Measles is an acute, highly contagious viral infection with serious complications involving mainly the respiratory tract.[1] Measles vaccine became available in the 1960s and its use led to rapid decline of disease. By 1990, it became clear that a single-dose measles immunization could not eliminate measles since it is still a common disease in many countries, albeit the introduction of measles vaccine in the expanded program of immunization globally. Two-dose schedule was used in varied strategies for each country. Measles is now the leading cause of vaccine-preventable death in children and is the next target to be eliminated after eradication of poliomyelitis.[2]

Case report

A 7 year-old boy from Bangkok was admitted to King Chulalongkorn Memorial Hospital with history of fever with rashes for 4 days prior to admission. The fever was low-grade on the first 2 days of illness and gradually became high thereafter. He also had rhinorrhea, productive cough , itchy skin rashes which began on the face in the morning extending to upper and lower trunk in the evening and to the limbs in the same night. Patient became drowsy, anorectic and not active. He received one dose of MMR (mumps, measles, rubella) vaccine at the age of 9 months. Four of his classmates also had measles.

Physical examination showed body temperature of 38.0 degree celsius and pulse rate of 118/min. Bilateral conjunctival injection was noted. Enlarged left anterior cervical lymph nodes, 1 cm. in diameter, and axillary lymph nodes' 0.5 cm. in diameter were found. Koplik's spots were seen on buccal mucosa. Maculopapular rashes were found on face, trunk, upper and lower limbs. Three days after admission, fever subsided and skin rashes were faded then became hyperpigmented.

Complete blood count showed Hct. 38.9 %, WBC 7,400 cells/mm^3; neutrophil 78.8 % lymphocyte 14.8 % monocyte 2.3 % eosinophil 0.1 % basophil 0.2 %. Platelet: 165,000 cells/mm^3.

Measles was provisionally diagnosed and he was admitted in an isolation room for symptomatic and supportive treatment. He recovered gradually and was discharged after 3 days of hospitalization. His serologic test was positive both for Measles IgM and IgG.

Discussion

During the prevaccination era, most cases of measles were found in unimmunized children particularly in early childhood with frequent complications.[1,3] Measles vaccine became available in the 1960s and its use led to rapid declines of the prevalence of the disease. By 1990, it became clear that a single-dose of vaccination could not eliminate measles. Two-dose schedule was then used in varied strategies for each country. Experiences have shown that measles incidence is roughly proportional to the vaccine coverage until some threshold is achieved, at which point measles epidemics become less frequent and smaller.[2]

In Thailand, measles vaccination has been routinely recommended in 9-12 months old children since 1984 and vaccine coverage increased to 86.4 % in 1993. However, outbreaks of measles in the country from 1984 to 1994 showed an increasing trend of measles in older age group. A study for determination of protective antibody against measles

in children who had received the first measles vaccination at the age of 9-12 months showed lowest antibody level at the age of 4-5 years after the first vaccination indicating that a single measles vaccination may not provide adequate protection.[4-6] Since 1996, the extended program of immunization (EPI) in Thailand recommended the first dose of MMR or measles vaccine should be given to children at the age of 9-12 months and the second dose at the age of 4-6 years.[7]

This report of measles in a 7 years-old child who had received one dose of MMR vaccine at the age of 9 months emphasizes that diagnosis of suspected measles should still be considered despite history of a prior measles vaccination.[8] Our patient had not received the second dose of measles vaccine as recommended by the EPI. The key concept is herd immunity, a situation which susceptible people are protected if there are enough immune people (91 % to 94 %) to prevent transmission of the disease. Because a single dose measles vaccination at 9 months is only about 85 % effective, clearly a second dose is needed to achieve that level of population immunity. Parents' education and emphasis on the importance of measles vaccination as well as active searching for unimmunized children should be done to reduce the attack rate of measles in Thai children.[9] In addition, because other students in the patient's class who were also likely to suffer from measles confirm the importance of second dose of measles vaccination.

Measles appears to be appropriate for the next target of global elimination after poliomyelitis since there is a very good weapon and a strategy that has been shown to work for controlling measles control as some countries have already set elimination goals and/or interrupted measles transmission. However, caution is needed in pursuing measles elimination because its transmissibility is so much higher than poliomyelitis and therefore it can more easily re-establish itself following an importation. In addition, other regions of the world are still tackling poliomyelitis and there is the danger of measles interfering with global poliomyelitis eradication. Unlike polio vaccine which can be given orally, measles vaccine must be given by injection. This issue makes vaccine delivery harder in addition to the injection safety problem. Finally, the issue of susceptibility is particularly important as it will need to maintain measles control activities while waiting for other region to catch up. On the other hand, unlike poliomyelitis, campaigns for measles control needs not be done and there is the potential to control the disease much faster if high coverage is achieved.[2]

Conclusion

Measles remains an important public health problem that can be prevented with an effective and affordable vaccine. Experience in countries that have achieved high vaccine coverage against measles supports a vaccination strategy including at least two doses of measles vaccines so that the transmission can be interrupted.

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