Bacteriology-2013

OMICS Group Conferences
Accelerating Scientific Discovery

International Congress on
Bacteriology & Infectious Diseases

November 20-22, 2013 DoubleTree by Hilton Baltimore-BWI Airport, USA

Disseminated BCG itis in children with primary immunodeficiency

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Abstract

Background: Bacille Calmette-Guérin (BCG) vaccine is a live attenuated vaccine derived from Mycobacterium bovis, which is compulsory at birth in many nonindustrial countries to prevent tuberculosis. The overall prevalence of primary immunodeficiency (PID) is 1:2,000 live births and characterized by increased susceptibility to various types of pathogens, like Mycobacterium bovis in BCG vaccine and others. BCG vaccine is considered to be generally safe; however, Mycobacterium bovis in BCG vaccine was reported to cause devastating complications and high mortalities in children with underlying primary immunodeficiency.
Methods: We conducted retrospective study over 6-years period, between 2007 and 2012, at tertiary care center, King Abdulaziz Medical City-WR, Saudi Arabia for patients diagnosed with disseminated BCGitis.
Results: out of 24 susceptible immunodeficiency patients given BCG vaccine compulsory at birth, disseminated BCGitis developed in 7 patients (29.1%); one patient with chronic granulomatous disease (CGD) and 6 patients with severe combined immunodeficiency. The average age at time of diagnosis was 10 ½ -months (range from: 3 to 30 months), one patient was diagnosed post-bone marrow transplantation. The diagnosis confirmed by microbiologic stain, DNA and TB cultures from lungs, gastrointestinal tract and skin biopsies. All patients received 4 anti-tuberculous (TB) drugs (deferent combination), except patient with chronic granulomatous disease (CGD) who received five anti-TB (including streptomycin) and one SCID patient with multiple cytokine deficiency who received 6 anti-TB and IFN-γ treatments. In compression to studies from nonindustrial countries reporting their survival rates that ranged between: zero to 50%, we achieved the best survival rate (71.4%) and one patient developed chronic lung disease.
Conclusion: our results highlight the importance of high index of suspicion of primary immunodeficiency (PID), early diagnosis of BCGitis and promote intervention with anti-TB drugs. However, because of prolonged anti-TB therapies and risk for high fatality rates of BCGitis in countries where BCG vaccine is compulsory at birth, we recommend suspending BCG vaccine for susceptible PID newborns till such diagnosis ruled out. Live attenuated vaccines should remain contraindicated in suspected patients with underlying CGD and cell mediated immune deficiencies, including combined immune deficiency and T-cell disorders.

Biography

Daifulah ALZahrani, MD, received bachelor degree of medicine and surgery form King Saud University in 1995. He was graduated from University of B.C. Vancouver, Canada in 2003 and received American Board of Pediatric (FAAP) in October 2003. He did 2-years of Allergy and Clinical Immunology Fellowship at McMaster University, Ontario, Canada and graduated in June 2005.

Thereafter, he got 1 ½ year fellowship training in Bone Marrow Transplant and Primary Immunodeficiency at Hospital for Sick Children, University of Toronto, Canada. He received American Board of Allergy and Clinical Immunology (ABAI) in Oct 2006.

Since 2007 till present he works as Consultant allergy, immunology and BMT at King Abdulaziz Medical City – WR, Jeddah, Saudi Arabia..