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Safety of intradermal BCG vaccine for neonates in eastern province, Saudi Arabia

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Objectives: Tuberculosis is a serious health problem in developing countries. One way to overcome this is to offer immunization to all newborns using BCG vaccine. BCG vaccine is safe but known to be associated with complications. The aim of this report was to evaluate the safety of BCG vaccine in Eastern Province, Saudi Arabia and outline our management for BCG vaccine related complications.

Methods: The records of infants with BCG vaccine complications were retrospectively reviewed for: age, sex, birth weight, gestation, presentation, treatment and outcome. All were immunized (BCG vaccine SSI, Copenhagen, Denmark, 0.05 ml injected intradermally in the left arm by a constant group of 3 trained nurses) within 48 hours after birth.

Results: Over a 3 years period (10.3.2008 to 10.3. 2011), 26,000 newborns received BCG immunization and 81 (51 M and 30 F) developed complications. This gives an incidence of 3.12 complications/1000 newborn. Their mean age was 4.8 months (2 months – 12 months). Their presentations were: (L) axillary lymphadenitis (n= 62), (L) supraclavicular lymphadenitis (n= 9), local collection at immunization site (n= 6), (L) cervical lymphadenitis (n= 1), bilateral axillary lymphadenitis (n= 1), (L) arm abscess (n= 1) and (L) axillary lymphadenitis and local collection (n= 1). All were normal immunologically except two (SCID and HIV). These received anti-tuberculous drugs in addition to surgery. The 6 with localized collection were aspirated only while the patient with (L) arm abscess had incision and drainage. Those with simple lymphadenitis (n=5) were treated expectantly and resolved. The patients with suppurative lymphadenitis were treated with total excision (n= 65) or incision and drainage (n= 3) without anti-tuberculous treatment.

Conclusions: Although, the use of BCG vaccine may be associated with side effects (a relatively high incidence of suppurative lymphadenitis), the potential morbidity and mortality from tuberculosis outweighs that from BCG related complications. BCG vaccine should be administered to all newborn where there is high prevalence of tuberculosis. BCG is contraindicated for immuodeficient infants. Non-suppurative lymphadenitis can be treated conservatively, while suppurative lymphadenitis should be excised. This is safe, avoids rupture and shortens the recovery period without the need for anti-tuberculous therapy.

Biography

Graduated in October 1981 from King Faisal University, College of Medicine and Medical Sciences, Dammam, Saudi Arabia. Awarded prize for best Graduate of the Year. In January 1985, awarded prize by the Royal College of Surgeons of Ireland as the best candidate in the Primary FRCSI Examination. In February 1987 awarded the Fellowship from The Royal College of Surgeons of Ireland. Currently working as a consultant pediatric surgeon and consultant pediatric urologist at Maternity and Children Hospital, Dammam, Saudi Arabia. Published more than 245 papers in reputed Journals. Reviewed more than 80 manuscripts for different Journal. Serving as an Editorial Board member of three Journals.

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Memory T cells support affinity maturation in secondary immune responses by raising the T cell activation threshold

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The overall affinity or antigen-sensitivity among pathogen-specific CD4 and CD8 T cells often increases in secondary immune responses. This T cell avidity maturation phenomenon is linked to the selective outgrowth of higher affinity T cell clones following pathogen re-exposure. Competition between high and low affinity T cells for antigen or a more robust expansion of high than low affinity T cell clones have so far been considered to cause affinity maturation. We herein report a yet unrecognized mechanism which is that secondary immune responses are characterized by a strongly increased affinity threshold to activate T cells. We observed that in secondary infections the expansion of low affinity T cells is selectively blocked, even cells with slightly reduced affinity show an impaired expansion, and only very high affinity T cells robustly expand. We show that previously generated memory CD8 T cells are responsible for raising the threshold. Moreover, this elevated threshold even applies to antigens that an individual becomes de novo exposed to in a secondary heterologous infection. The implications of our observations to understand T cells responses in heterologous infections and for the design of tumor targeting vaccines will be discussed.

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