

Background: BCG vaccination is given at birth or as soon as possible in TB endemic countries. BCG Vaccine associated complications (BCG-VAC) ranging from subcutaneous abscesses, lymphadenitis, osteomyelitis and disseminated BCG infection have been reported in children with primary immune deficiencies.

Objective: To describe the BCG-VAC in patients with 4 groups of PIDs – Severe Combined Immune Deficiency (SCID), Mendelian Susceptibility to Mycobacterial Diseases (MSMD), Chronic Granulomatous Disease (CGD) and other PID types.

Design: Systematic review and meta-analysis. Databases searched – PubMed, Embase, Scopus, Web of Science.

Inclusion Criteria: PID patients who had BCG associated local reactions, lymphadenopathy, skin manifestations hepatosplenomegaly, osteomyelitis, and other systemic infections were included.

ACADEMIC P.E.A.R.L.S

Pediatric Evidence And Research Learning Snippet



BCG Vaccine Associated Complications in Primary Immune Deficiencies

Results:

887 articles retrieved from all the databases (Recognised PID patients who developed BCG complications). Of these, 214 satisfied the inclusion criteria and were used for systematic review and 27 fulfilled criteria for meta-analysis.

1166 cases identified with BCG complications reported in PID patients – Severe Combined Immune Deficiency (SCID) most common 40% .

Common BCG complications – Lymphadenopathy, nodules, ulcers, erythema, rash SCID patients mainly had skin rash and systemic involvement (fever and hepatosplenomegaly) where as MSMD and CGD patients had lymphadenopathy.

Meta-analysis of 27 studies with 1692 patients of Primary Immune Deficiencies, the incidence of BCG vaccine associated complications was 29.9% (506 patients)

69.9% of these patients were from developing countries. Mortality of PID patients with BCG infections: **43.5% (Mainly SCID babies)**

Conclusion:

- Several PID patients are susceptible to BCG vaccine related complications
- Hence the importance of newborn screening prior to BCG vaccination

Key Message: BCG vaccine related complications can be an indicator of underlying primary immune deficiency.

EXPERT COMMENT



“Significant study as TB burden is very high in most developing countries and BCG vaccination at birth is mandatory. Implementation of Newborn screening for primary immune deficiencies prior to BCG vaccination is very costly and hence difficult for these countries. Hence the best option would be to screen for SCID using Absolute lymphocyte count (CBC/DLC) prior to BCG vaccination whenever possible. When BCG related complications are encountered, evaluate for underlying PID (SCID/CGD/MSMD)”

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Reference

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