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Perspective

Bacillus Calmette-Guérin (BCG) Vaccination and its Immunogenicity

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DESCRIPTION

Bacillus Calmette-Guérin (BCG), a live-attenuated bacterial vaccine produced from Mycobacterium bovis, was first identified in 1902 from a Tuberculosis-infected cow (TB). For 13 years (1908-1921), the isolate was cultivated continuously for more than 230 generations to produce a mutant strain with reduced virulence but significant immunogenicity. Bacillus Calmette-Guérin (BCG) vaccine was first used in humans in 1921 and has been included in World Health Organization (WHO) child vaccination programmes since 1974. Bacillus Calmette-Guérin (BCG) was utilised in the national immunisation programmes of 180 nations or territories in Asia, Africa, Europe, and America as of 2018, with a coverage range of more than 90%. The original BCG strain has been delivered to 20 different worldwide sites since the 1920s, where the vaccine has been routinely sub-cultured under diverse conditions. This has resulted in a wide range of licensed Bacillus Calmette-Guérin (BCG) formulations that differ in terms of live mycobacteria concentration and genetic composition.

BCG vaccination

Whether it's used for immunological prophylaxis or immunotherapy, the safety of Bacillus Calmette-Guérin (BCG) has remained as a key concern. In nations, where Bacillus Calmette-Guérin (BCG) immunisation is widely administered, adverse effects in youngsters have been well documented. Bacillus Calmette-Guérin (BCG) vaccine complications can range from moderate to severe. Immunological-compromised people with illnesses such as severe comprehensive immune deficiency, cellular immune deficiency, chronic granulomatous disease, IL-12 and IFN-mediated immune impairment sometimes has more severe reactions to Bacillus Calmette-Guérin (BCG) vaccination and should avoid it. Other factors that may contribute to the development of adverse reactions include the evaluation criteria used, the potency and dosage of the vaccine strain used, the number of immunizations used, the route of delivery, the age and immune status of the vaccinated individual, and the skills of the operator administering the vaccine.

Adverse reactions of BCG vaccination

Mild and transient fever (that resolves spontaneously after 1-2 days), injection site abscesses (with a diameter of >10 mm that heal in >12 weeks), lymphadenitis, Tuberculosis (TB) skin rash (such as scleroderma erythema, scrotal lichen, and TB papules necrosis that occur between 10 days and 2 months after BCG vaccination), osteomyelitis, and systemic disseminated Bacillus Calmette-Guérin (BCG). It has been reported that 1 in 2500 BCG vaccine recipients will experience localised Bacillus Calmette-Guérin (BCG)-associated mild complications, while 1 in 100,000 will experience disseminated severe complications. As abscess formation following immunisation is frequently self-limiting and self-resolving, only a small minority of people require hospitalisation and additional procedures. The most common side effect of Bacillus Calmette-Guérin (BCG) is lymphadenitis, which presents as local lymph node enlargement and can cause pustules, ulceration, suppuration, and other clinical abnormalities such as caseous, abscess, and sinus. According to statistical analysis, 30%-80% of Bacillus Calmette-Guérin (BCG) lymphadenitis can proceed to purulent lymphadenitis, and 15%-30% of non-suppurative lymphadenitis can progress to purulent lymphadenitis. Furthermore, an inexplicable change in urine colour has been described as an atypical reaction following Bacillus Calmette-Guérin (BCG) immunisation. In general, the urine colour turns orange on the second day after immunisation and then recovers on its own in 1 week, requiring no intervention.

CONCLUSION

Bacillus Calmette-Guérin (BCG) is the most extensively used vaccine in the world, having a great safety record. It is worth noting that a very tiny percentage of Bacillus Calmette-Guérin (BCG) patients may experience allergic purpura, anaphylactic shock, immunological thrombocytopenia, and lichenoid skin lesions following immunisation. Although the reported incidence rate of the aforementioned problems is low, urgent symptomatic treatment is required, which may include systemic anti-tuberculosis medication if necessary. BCG is not given anymore because; it was replaced in 2005 with a targeted programme for babies, children and young adults at higher risk

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of TB. This is because TB rates in this country are very low in the general population. TB is difficult to catch because this requires close contact with an infected person (for example, living together).