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**INDO AMERICAN JOURNAL OF  
PHARMACEUTICAL SCIENCES**Available online at: <http://www.iajps.com>**Review Article****TUBERCULOSIS AND BCG VACCINE - A REVIEW**Fateme Parooei <sup>1</sup>, Ali Jafari Khalilabadi <sup>2</sup>, Mahmood Anbari <sup>3</sup>, Morteza salarzaei <sup>1\*</sup><sup>1</sup> Student of Medicine, Students Research Committee, Zabol University of Medical Sciences, Zabol, Iran<sup>2</sup> Students Research Committee, Zahedan University of Medical Sciences, Zahedan, Iran<sup>3</sup> Zabol University of Medical Sciences, Zabol, Iran**Abstract:**

**Introduction:** Mycobacterium tuberculosis is a Non-moving bacillus that lacks spore and acid fast. This bacterium produces a unique compound called mycolic acid in its wall affecting the performance of the wall. The vascular wall of this bacterium offers unique properties such as hydrophobicity, having acid fast, acid resistance, openness, dryness and many antibiotics.

**Methods:** In this review article, the databases Medline, Cochrane, Science Direct, and Google Scholar were thoroughly searched to identify the studies investigating Tuberculosis and BCG vaccine. In this review, the papers published until early January 2017 that was conducted to study the Tuberculosis and BCG vaccine were selected. In searching for the articles, those English papers were selected that had investigated Tuberculosis and BCG vaccine and its complications.

**Findings :** The awareness of this dangerous complication, its underlying causes, and the clinical features of this disease, and paying due attention to this complication while examining infants who are taken to the doctor for the magnitude of lymph nodes adjacent to the inoculation region is of great importance for all doctors specially pediatricians.

**Conclusion and Discussion:** For this reason, the doctors need to be aware of the dangerous, yet less prevalent, complications of BCG vaccine. When they are examining the infants, they need to conduct complete examination and examine cervical and adjacent lymph node. They should also give due attention to hepatosplenomegaly, since when there are cases of hepatosplenomegaly, the patient needs to undergo further examination for the BCG infection.

**Key words:** Tuberculosis, BCG, vaccine

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**INTRODUCTION:**

Mycobacterium tuberculosis is a Non-moving bacillus that lacks spore and acid fast. This bacterium produces a unique compound called mycolic acid in its wall affecting the performance of the wall (1). The vascular wall of this bacterium offers unique properties such as hydrophobicity, having acid fast, acid resistance, openness, dryness and many antibiotics. The bacterial growth is very slow and the cell division time is between 12 and 24 hours (2). The slow growth has to do with the impermeability of cellular wall that makes the absorption of foodstuffs very slow. Moreover, the extent of RNA synthesis is slow as well. In the past, it was assumed that mycobacterium tuberculosis was formed from mycobacterium bovis during the domestication of livestock (3). The genome sequencing of both bacteria indicate that mycobacterium bovis has some deletions in its genome but it is 99.95% similar to the DNA of mycobacterium tuberculosis. This finding negates the formation of mycobacterium tuberculosis from mycobacterium bovis (4). Mycobacterium tuberculosis was identified as the cause of tuberculosis by Robert Koch in 1882. Mycobacterium tuberculosis, the causative agent of tuberculosis, is considered as a serious global health problem all specially in underdeveloped as well as developing countries (5). John Bunyan has named tuberculosis as the captain of human death, and Olivier Wendell Holmes has called tuberculosis the white plague. This disease has continued to be a serious threat for human health.

**METHODOLOGY:**

In this review article, the databases Medline, Cochrane, Science Direct, and Google Scholar were thoroughly searched to identify the studies investigating Tuberculosis and BCG vaccine. In this review, the papers published until early January 2017 that were conducted to study the Tuberculosis and BCG vaccine were selected. In searching for the articles, those English papers were selected that had investigated Tuberculosis and BCG vaccine and its complications.

**FINDINGS:**

FSC vaccine has been used all over the world since 1921. This vaccine is made from the organism of mycobacterium bovis. The protective effect of this vaccine is generally considered 40-60%. The protection against milliard TB and Tuberculous meningitis is estimated to be 80-90% (6). FSC vaccine is inoculated at birth in many countries. Its inoculation dose is 5.0 ml in children under one year old. It is injected intradermally at the deltoid region of the right arm. BCG vaccine is one of the safest vaccines and has few dangerous complications (7). However, the tuberculosis arising from its inoculation, despite being rare and

having the prevalence of less than one case in one case of inoculated dose, has a high rate of mortality and is considered as the most dangerous complication of vaccine (8). That is why this vaccine is inoculated at birth in most of the countries. The awareness of this dangerous complication, its underlying causes, and the clinical features of this disease, and paying due attention to this complication while examining infants who are taken to the doctor for the magnitude of lymph nodes adjacent to the inoculation region is of great importance for all doctors specially pediatricians (9).

**DISCUSSION AND CONCLUSION:**

The most important part of the controversial discussion of BCG vaccine is about its different efficacy (10). In a study conducted in Britain, the immunity of BCG vaccine was estimated to be 60-80%. However another study reported that this vaccine lacks any efficacy (11). The study conducted by Fine et al indicated that BCG is likely to reduce TB infection rate up to 50%. Moreover, the aforementioned study indicated that BCG vaccine is able to reduce the infection to 19-27% and reduce the likelihood of the disease progress to an active form up to 71% (12). The studies indicate that the efficacy of the vaccine reaches zero after 20 years of immunization. However, a study showed evidences of the vaccine efficacy after 60 years of primary immunization (13). BCG vaccine is highly effective in the prevention of miliary tuberculosis and meningitis. Thus, even when the efficacy of the vaccine for immunizing against pulmonary tuberculosis is not effective, the vaccine is still prescribed for fighting against miliary tuberculosis and meningitis(14). Using BCG as a post-infection vaccine against tuberculosis does not create sufficient immunity against the recurrence of the infection in adults and makes the infection even worse (15). The worsening of the disease by BCG vaccine was observed after the primary infection with TB bacillus in the animal model and this can be one of the reasons why BCG vaccination failed in the endemic areas (16). In the endemic where the individuals are highly exposed to bacteria, BCG revaccination results in active tuberculosis.

For this reason, the doctors need to be aware of the dangerous, yet less prevalent, complications of BCG vaccine. When they are examining the infants, they need to conduct complete examination and examine cervical and adjacent lymph node (17). They should also give due attention to hepatosplenomegaly, since when there are cases of hepatosplenomegaly, the patient needs to undergo further examination for the BCG infection.

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