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The correlation of Foxp3 + gene and regulatory T cells with scar BCG formation among children with Tuberculosis

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ABSTRACT

Tuberculosis infection causes a complex immunological response, where interactions between the pathogen and the host are unique, making it difficult to treat and control this disease. According to WHO, an estimated 1 million children became ill with TB, and 233,000 children died of TB in 2017. Bacillus Calmette-Guérin (BCG) vaccines continue to be the only vaccines to prevent Tuberculosis (TB). Studies suggesting the association of BCG scar with decreased childhood mortality in developing countries have rekindled the interest in BCG scar. However, the direct effect of the BCG scar remains unknown. We examined 76 cases in this study. All Subjects were diagnosed with Tuberculosis. BCG scars were examined directly when physical examination at the BCG vaccination site was performed. Tuberculin Skin Test was performed with 0.1 ml purified protein derivative (PPD) solution (5TU PPD/0.1 ml) injected intradermally. We examined the FOXP3 gene by real-time PCR and the level of Treg byELISA. The comparison of the mean Treg gene expression and the Treg protein content was higher in the positive scar group than in the negative scar group. It shows that Treg plays a role in the Tuberculosis during its active phase development. Treg protein levels were higher in the combination of positive TST and scar. It shows that BCG scarring is an essential marker of a well-functioning immune system. Cheap and straightforward initiatives like early BCG vaccinations, monitoring BCG scarring, and revaccinating scar-negative children could have an enormous immediate impact on global child survival.

1. Introduction

Tuberculosis is a disease caused by the Mycobacterium Tuberculosis (Mtb). For thousands of years, humans have been infected with Mtb. This infection causes a complex immunological responses, where interactions between the pathogen and the host are unique, making it difficult to treat and control this disease. People of low economic

TB, and 233,000 children died of TB in 2017. However, the actual burden of TB in children is likely higher, given the challenge in diagnosing childhood TB. Although overdiagnosis does occur in some settings, underdiagnosis is the rule in most TB-endemic areas, where young children can only access TB care via referral hospitals. Only 23% of the estimated 1.3 million children under five years who are eligible received preventive therapy in TB households in 2017. Ending the TB epidemic is