

Gene Polymorphism of the Bacille Calmette-Guérin Vaccine Strain is Currently Using in Iran by Miru-Vntr Typing

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Background and Aim:

Tuberculosis (TB), caused by *Mycobacterium tuberculosis* is a global health problem. One-third of the world's population is infected with *Mycobacterium tuberculosis*. In developing countries with high TB incidence, due to increased health expenses, the control of TB is sensitive issue. The Bacille Calmette-Guérin (BCG) vaccine; an attenuated live vaccine is only available effective vaccine for TB control. In some studies, Iran is using own locally BCG vaccine strain with unknown substrain. In present work we studied molecular characterizations of current BCG strain uses in Iran.

Materials and Methods:

Sixty seven different vials of BCG vaccine; 28 stocks and 39 non-stocks were selected. DNA was extracted by using modified CTAB method and PCR was done for detection of genes RD1, RD2, RD14 and DU1. A multiplex PCR was applied looking for four target regions including RD1, RD8, RD16 and SenX3-RegX3. The MIRU- VNTR typing was used to determine VNTR profile of BCG strains. The amplified RD16 region was sequenced for future confirmation.

Results:

Our results showed that all studied batches were *Mycobacterium bovis* BCG and molecular analysis revealed Iranian vaccine strain possess RD1, RD8, RD16, SenX3-RegX3 and DU1 regions but not RD2 and RD14. The VNTR profile of BCG strains was 2-2-5-2-3-4-11. Sequencing of RD16 region showed that BCG vaccine strains are accordance with the BCG Pasteur 1173P2. Based on results, all of analyzed vaccine batches were compatible with BCG Pasteur 1173P2.

Conclusion:

In conclusion based on our result, all of studied BCG strains; collected from different sources in Iran were recognized as the BCG Pasteur 1173P2 strain. No genetically diversity among stocks and non-stocks were detected.

Key words: BCG vaccine, Bacille Calmette-Guérin, Gene polymorphism, Iran