Epidemiology and prevention

CD14 and TLR4 receptors in delayed type hypersensitivity to PPD in young healthy volunteers vaccinated with Mycobacterium bovis BCG

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Background:
The innate immunity critically depends on signalling by pattern recognition receptors (PRRs) that recognize microorganism specific motifs. One such receptor ligand complex is formed between human Toll-like receptor 4 (TLR4), MD2 and CD14. Mycobacterium lipid compounds signal in myeloid cells the activation of inflammatory gene expression through NF-kappa-B. We asked a question as too whether the polymorphisms in CD14 and TLR4 genes influence the development of delayed type hypersensitivity (DTH) to tuberculin in healthy volunteers vaccinated with M. bovis BCG.
Methods:
DTH to PPD (purified protein derivative) was measured in skin tuberculin test. Polymorphisms of CD14 and TLR4 genes were checked using allelospecific and RFLP PCR. The expression of CD14 on freshly isolated and PPD stimulated monocytes was determined by flow cytometric analysis..
Results:
About 50% of BCG vaccinated volunteers showed negative reaction to PPD (TT-). We could see no differences in TLR4 polymorphism between tuberculin positive (TT+) and TT- subjects. In contrast the genotype CC of CD14 was more common in TT+ than TT- group. Freshly isolated monocytes from TT- volunteers had increased level of membrane CD14 (mCD14) compared to the cells from TT+ group (449,21 MFI versus 378,27 MFI; p=0,03). The stimulation of monocytes with PPD caused a significant increase in mCD14, a similar in two groups under the study.
Conclusion:
The CD14 signaling may influence cellular response to mycobacterial antigens expressed by attenuated M. bovis BCG bacilli. Supported by the Ministry of the Science and High School, Grant No 2 P05A 112 30