Helminth infections interfere with vaccination efficacy

Minka Breloer
Bernhard Nocht Institute for Tropical Medicine, Germany

One third of the human population is infected with parasitic worms. To avoid their elimination, these parasites actively dampen the immune response of their hosts. This immune suppression will also affect immune responses to third party antigens such as vaccines. Accordingly, several studies report a negative correlation between pre-existing helminth infections and response to vaccination in the human population. We use *Litomosoides sigmodontis* infected mice to further analyze this parasite induced interference with vaccination efficacy. We show that experimental vaccination against the liver stage of *Plasmodium berghei* elicited reduced numbers of *Plasmodium* specific CD8+ cytotoxic T lymphocytes in mice with concurrent *L. sigmodontis* infection. Chronic nematode infection also led to complete suppression of IgG responses to thymus dependent (TD) model antigen vaccinations (DNP-KLH, Ovalbumin). Thereby, the parasite suppressed B-cell function indirectly, via accessory CD4+ T helper cells, as thymus independent vaccination (NIP-Ficoll) was functional and already numbers and frequency of vaccine induced follicular T-helper cells were reduced. Strikingly, a reduced humoral response to TD vaccination was still observed if vaccination was performed more than 16 weeks after clearance of infection. Thus, vaccination may not only fail in helminth infected individuals but also in individuals with a history of previous helminth infections. Helminth induced interference with bystander CD4+T cell activation resulted in a suppressed antigen specific proliferation of Ovalbumin specific TCR transgenic OT-II T cells in vivo, after adoptive transfer into *L. sigmodontis* infected mice. Using this simplified system, we are currently unraveling the chain of events leading from the presence of *L. sigmodontis* in the thoracic cavity to the final suppression of T cells specific for a different antigen at a different site.

breloer@bni-hamburg.de

An evaluation of medical students’ knowledge of pediatric vaccinations in United Kingdom

Nighat Jahan Nadeem
King’s College London, UK

Aims: Medical Students now have decreased exposure to vaccine preventable diseases as successful vaccination programs have decreased their prevalence. This may cause misconceptions and misinformation. The aim of this study was to explore medical students’ knowledge of pediatric vaccinations, identify training needs and make recommendations for future training.

Methods: Vaccination knowledge of students from 3 UK medical schools was assessed by an anonymous, cross sectional, internet survey from 14 April 2015 to 14 July 2015. Questions addressed vaccine guidelines, schedules, administration, handling, contraindications and adverse events. Analysis included comparison of proportions with the use of descriptive statistics. Ethical approval was obtained from King’s College, University of London.

Results: 109 students participated from 3 medical schools. The mean knowledge score was 5.7/10 (57%) and the most correctly answered question was related to whether vaccines cause autism. This was answered correctly by 102/103 (99.0%) of students. The most poorly answered question was related to whether vaccines can be frozen to maintain their potency and was answered correctly by 31/103 (30.1%). The number of students confessing to not knowing an answer rather than attempting to guess the answer was also highest for this question: 43/103 (41.7%).

Conclusion: This study identifies gaps in knowledge amongst medical students and the findings form a platform to develop educational interventions to integrate into formal educational curriculum. Recommendations include developing up-to-date core competencies and promoting specific communication skills training in the role play setting. Teaching methods used in various institutions should be analyzed and compared to determine the most effective teaching strategies.

nighat.nadeem@doctors.org.uk