Ascaris suum infection negatively affects the response to a Mycoplasma hyopneumoniae vaccination and subsequent challenge infection in pigs - DTU Orbit (03/12/2018)

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Since their first introduction more than a century ago, vaccines have become one of the most cost-effective tools to prevent and manage infectious diseases in human and animal populations. It is vital to understand the possible mechanisms that may impair optimal vaccine efficacy. The hypothesis posed in this study was that a concurrent Ascaris suum infection of pigs vaccinated with a Mycoplasma hyopneumoniae (Mh)vaccine would modulate the protective immuneresponse to a subsequent challenge infection. Four groups of pigs were either (1) untreated (group C), (2) vaccinated against Mh 3 weeks after the start of the study (group V), (3) given a trickle infection with A. suum throughout the study (group A), or (4) given a trickle infection with A. suum and vaccinated against Mh (group AV). All pigs were subsequently inoculated with live Mh bacteria 4 weeks after the Mh vaccination and necropsied after another 4 weeks. All pigs in group V sero-converted 3 weeks after vaccination (100%), as opposed to only 33% of group AV pigs that were Mh-vaccinated and given A. suum. At the end of the study, only 78% of pigs in group AV had sero-converted. Pigs in group AV had a higher mean percentage of lung pathology and the variation was significantly higher in these pigs compared to pigs in group V. The pattern of gene expression in the lungs and draining lymph nodes indicated a local Th2-skewed response induced by A. suum. Our study indicated that A. suum significantly compromised the effect of Mh vaccination. The impact of reduced vaccine efficacy caused by a common gastrointestinal helminth emphasises the importance of parasite control. More focus should be put into this area of research to outline the practical consequences of this interaction, and to be able to predict, prevent and correct negative interactions. © 2009 Elsevier Ltd. All rights reserved.