Respiratory diseases among pig farmers in relation to immunological reactions

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ABSTRACT

This PhD dissertation is a summarized dissertation and includes four original scientific papers. The studies were conducted during my employment at Institute of medical microbiology, University of Aarhus, in the years 1985-1990. The writing proceeded in 2005-2007.

The aim of the study was to describe the respiratory health status and the relation to pig farm exposure among pig farmers in Denmark, to measure the lung function, the atopic status and the occurrence of IgE and IgG antibodies to different antigens in the air of swine confinement buildings, and to assess associations between respiratory symptoms, lung function, atopy and antibodies to antigens in the air of swine confinement buildings.

Information was collected from 3653 farmers by a mailed questionnaire. Afterwards, stratified sub-samples of farmers were visited and interviewed, and lung function test, blood sampling and skin prick test were performed. Serological methods included were crossed immunoelectrophoresis, radio immunoelectrophoresis, indirect immunofluorescence and enzyme-linked immunosorbent assay.

It was shown that pig farmers have more respiratory and mucosal membrane irritative symptoms than farmers with cattle. The prevalence of symptoms was positively correlated to hours spent in pig farming. Having fattening pigs further contributed to the risk of having symptoms. No indications were found that pig farmers had allergy to pigs. Although two different methods were used no IgE antibodies to pig epithelium could be demonstrated. IgG antibodies to pig-related antigens were shown to be lower in farmers with atopy, low lung function or respiratory and mucosal membrane irritative symptoms. Low prevalence of atopy and respiratory symptoms among farming school attendants compared to controls were also documented. Furthermore, it seemed that being born and raised on a farm have a protecting effect according to allergy.

Thus, pig farmers have more respiratory and mucosal membrane irritative symptoms than other type of farmers but this difference can not be explained by allergy to pigs. Quite the contrary, farmers have an “anti-atopy” protecting factor of unknown origin. If this phenomenon has anything to do with the protection against allergic complaints, e.g. through an activation of the Toll-like receptors in the innate immune system, can be speculated.