Further studies on the transmissibility of BSE to pigs

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Background

Further investigation of the possible transmission of BSE to pigs is to be undertaken. The results of this study enabled a more informed approach to the diagnosis of TSE in the pig to be taken, and answered in greater depth the question of possible infection of the national pig herd by feeding contaminated meat and bonemeal (MBM).

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Research Approach

The study involved investigation of the pathology by immunocytochemistry, investigation of the, presumably incidental, vacuolation of the rostral colliculi by examination of pigs from outside of the UK and of pigs alive prior to the appearance of BSE in 1986 by passage of the rostral colliculi of unchallenged control pigs into pigs parenterally challenged. In addition further examination was carried out of the apparently normal brains from pigs orally challenged with BSE to confirm lack of transmission by this route.

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Results

Pig brains from the UK, Germany, Australia and New Zealand were examined histopathologically. Vacuolation was observed in most of the UK pigs examined and appeared to be more severe in older pigs. The rostral colliculus vacuolation was also present in the brains of pigs from the other countries, though to a lesser extent than UK pigs.
Immunohistochemistry was used to investigate this vacuolation in order to identify disease specific PrP, if present, and to ascertain the pathological significance of these vacuoles. Anti-PrP failed to produce disease specific staining in the vacuolated rostral colliculi. Anti-GFAP staining carried out on pigs which showed marked vacuolation showed no evidence of atrocytosis, whereas a marked hypertrophy of astrocytes was evident in an animal experimentally infected with BSE. This supports the conclusion that the vacuolation of the rostral colliculi of pigs is a normal phenomen and not the result of incipient TSE infection in this species. Similarly, the use of other markers failed to indicate any association of additional CNS pathology with the rostral colliculus vacuolation.
In order to ascertain whether an endemic TSE-like agent is the cause of the vacuolation passage of material from the rostral colliculus into pigs by parenteral challenge was carried out . Rostral colliculi of normal, healthy cull sows, half born in 1996 or earlier and half born after 1996 (when the MBM ban came into force) were examined. Those showing a high incidence of vacuolation

were used as the inocula. No clinical signs suggestive of a TSE were detected in the inoculated animals, nor was there any evidence of histopathological changes characteristic of TSEs in their brains.

The results of this study indicate that the rostral colliculus vacuolation highlighted by previous studies is a normal, background pathological finding in the pig and is not caused by an endemic TSE-like agent.

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Published Papers

1. Konold, T., Spiropoulos, J., Chaplin, M.J., Thorne, L., Spencer, Y.I., Wells, G.A. & Hawkins, S.A. (2009) Transmissibility studies of vacuolar changes in the rostral colliculus of pigs. *BMC Veterinary Research*, 5, 35