with a predominance of thin, long and undulating, gram-negative organisms, very similar to spirochetes. Histologically, the epidermis is superficially necrotic or thickened, with parakeratotic and orthokeratic hyperkeratosis. Some neutrophils can be noticed in the epidermis and in the superficial dermis. In silver stained tissue sections, numerous free spirochetal organisms are consistently found in the reactive epidermis.

Skin biopsies were cultured on various media under anaerobic conditions. Spirochetes were detected within the agar of blood agar plates after 4 d of incubation, along with colonies of other anaerobic gram-negative rods. The spirochetes grew well at 42°C and were subcultured by transferring small portions of agar onto another medium. Studies are underway to further characterize the isolates, and will subsequently be reported. Electron microscopic examination of cultures has shown that the spiorchetes measure 9 μm by 0.8 μm.

According to local practitioners, the condition responds well to topical treatment with tetracycline preparations. This condition is very similar to digital dermatitis described in Europe (1) and the United States (2,3). Until the fall of 1993, such a condition had not been observed in Quebec. It is well known that spirochetes may have a tendency to opportunistically invade skin lesions, but they may also be the primary agent in some conditions such as yaws, bejel, and pinta, which are human nonvenereal treponemal dermatitides. At the present time, it is not known if the observed spirochetes are the primary agent in this digital dermatitis or are simply opportunistic invaders.

References

1. Blowey RW, Sharp MW. Digital dermatitis in dairy cattle. Vet Rec 1988; 122: 505–508.
2. Read DH, Walker RL, Castro AE, Sundburg JP, Thurmond MC. An invasive spirochaete associated with interdigital papillomatosis of dairy cattle. Vet Rec 1992; 130: 59–60.
3. Rebhum WC, Payne RM, King J, Wolfe M, Begg SN. Interdigital papillomatosis in dairy cattle. J Am Vet Med Assoc 1980; 177: 437–440.

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Ontario

Porcine reproductive and respiratory syndrome virus identification in proliferative and necrotizing pneumonia cases from Ontario

Between the fall of 1990 and the winter of 1991, the Veterinary Laboratory Services, Guelph, Ontario, made histological diagnoses of proliferative and necrotizing pneumonia (PNP) in nine porcine submissions (1). Since tissues had been kept frozen (−70°C), samples of lung tissues from 9 pigs representing 6 of the submissions were tested for the presence of porcine reproductive and respiratory syndrome virus (PRRSV) at the Health of Animals and Food Laboratory in Saint-Hyacinthe. A cytopathic effect was observed in porcine alveolar macrophages inoculated with homogenates of lung tissues from pigs from 3 submissions. When indirect immunofluorescence (IIF) was performed using PRRSV monoclonal antibody SDOW17, bright cytoplasmic fluorescence was observed for each isolate. Fluorescence was also noted when macrophage-propogated isolates were later tested using monoclonal antibodies VO17 and EP147, 2 monoclonal antibodies reported to react with the U.S. but not the European isolates of PRRSV (2). The reactivity of these monoclonal antibodies by IIF suggest that the PRRSV isolates from Ontario show a closer antigenic relationship to U.S. than to European isolates.

Aggregates of viral particles surrounded by gold granules were observed by immunogold electron microscopy (3) for each of the isolates from Ontario that were identified. Immunohistochemical detection of PRRSV and influenza virus type A antigens was performed by immunogold and silver staining (IGSS) on formalin-fixed, paraffin-embedded, lung tissues (3,4) for 5 of the 6 submissions. Labelling for PRRSV antigens was observed in lung tissues from which the virus was isolated and also in 1 case from which PRRSV was not isolated. In addition, influenza viral antigens could be demonstrated in 1 case from which PRRSV was isolated.

The present results indicate that PRRSV can be isolated from the lungs of pigs with lesions of PNP. Isolation was successfully performed more than 2 1/2 y after the collection of the samples, underlining the stability of this virus in tissue samples kept frozen at −70°C. Furthermore, PRRSV antigens could be detected by IGSS in formalin-fixed lung tissues from which PRRSV was not isolated, demonstrating the potential usefulness of this immunohistochemical method. Although swine influenze virus could not be isolated from any of the submissions described here, influenza virus type A antigens could be demonstrated by IGSS in tissues from which PRRSV was isolated. It could not be established whether the influenza virus type A antigen represents classical H1N1 swine influenza virus or the swine influenza A virus variant reported to be the cause of PNP. The results from these Ontario cases are in agreement with those of an earlier study from Québec, in which the isolation and identification of PRRSV from lungs with lesions of PNP were reported (3). No influenza virus could be isolated from the lungs in that study, nor could influenza virus antigens be demonstrated by immunohistochemistry in lung tissues that had been fixed. In a subsequent immunohistochemical retrospective survey of PNP cases from Québec, PRRSV

antigens were often demonstrated in lung tissues of pigs showing these histological lesions, while influenza A virus antigens were only rarely demonstrated (4). **The information gathered from these cases in Ontario further substantiates the finding that the histological lesions of proliferative and necrotizing pneumonia can be associated with porcine reproductive and respiratory syndrome virus infection.** Although additional work is still needed to establish the exact role of PRRSV in the pathogenesis of PNP, PRRSV should be considered in establishing a diagnostic profile for this condition.

References

1. Thomson G, Carman S. Proliferative and necrotizing pneumonia (PNP) of swine: the Ontario situation. Can Vet J 1991; 32: 313.
2. Nelson EA, Christopher-Hennings J, Drew T, Wensvoort G, Collins JE, Benfield DA. Differentiation of U.S. and European isolates of porcine reproductive and respiratory syndrome virus by monoclonal antibodies. J Clin Microbiol 1993; 31: 3184–3189.
3. Magar R, Larochelle R, Robinson Y, Dubuc C. Immunohistochemical detection of porcine reproductive and respiratory syndrome virus using colloidal gold. Can J Vet Res 1993; 57: 300–304.
4. Larochelle R, Sauvageau R, Magar R. Immunohistochemical detection of swine influenza virus and porcine reproductive and respiratory syndrome virus in porcine proliferative and necrotizing pneumonia cases in Quebec. Can Vet J 1994; 35: 513–515.

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