Pleuritis in herds with low levels of antibodies to Actinobacillus

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Introduction

Pleuritis are often associated to *Actinobacillus pleuropneumoniae* (*App*). Pigs in affected herds generally have high prevalences of pigs with high amounts of antibodies to *App* (1), but also herds with low levels of antibodies to *App* have been attended with high frequensies of pleuritis. This study aimed to scrutinise the impact of secondary invading microbes in such herds.

Materials and Methods

Three farrow to finish sites within a local concern with an annual production of 22,500 fatteners were investigated. Registrations for pleuritis ranged from 16.4 to 30.2 % at slaughter. In total, 212 serum samples were collected in one day. Antibodies to *App* serotypes 2 and 3 and to *Pasteurella multocida* (*Pm*) were analysed with ELISA systems (2, 3).

An indirect ELISA detecting antibodies to *Streptococcus suis* (*Ss*) was developed. In brief, microtiter plates were coated over night with an ultrasonicated antigen of *Ss* (strain CCUG 7984). After 1 h of incubation with serum diluted 1/100 in PBS-T the conjugate (Protein A, Bio-Rad) was added. The reaction was stopped with H_2SO_4 and the optical density was read at 495 nm. A positive control adjusted to A_{450} = 1.0 was added to each plate.

Table 1. Prevalences (%) of serum antibodies to *App*, (*App2*, *App3* or both), *Pm* and *Ss* related to age

Age,	(n)	Seroneg	*App+* Alone	*App+* and *Pm+*	*App+* and *Pm+* and *Ss+*	*Pm+* Alone	*Pm+* and *Ss+*	Ss+
5 weeks	10	80		20				
8 weeks	30	60	7	7		23		3
11 weeks	20	60				25	10	5
14 weeks	30	45		5		40	10	
17 weeks	20	10		30	20	30	10	
21 weeks	20	5	5	10	55	10	10	5
24 weeks	40	18		25	30	13	13	3
gilts	6				67		33	
Sows, 1st par	12				67	8	25	
Sows, 2nd par	12				75		25	
Sows, 3rd par	12				83		17	

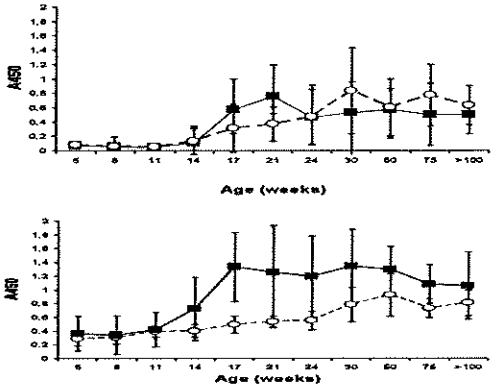
Results

The OD-values to *App2* increased from 14 to 17 weeks of age, but remained at modest levels. The onset of *App3* was not equally evident, but the OD-values increased with time (Figure 1 top).

Serum antibodies to *Pm* started to increase betwen 11 and 14 weeks of age, whereas the serological response to *Ss* progressed more slowly (Figure 1 bottom).

All ELISA-systems employed A_{450} as cut off. The point prevalence rate for seropositivity related to age is shown in Table 1. Sows were generally seropositive to all microbes, but absorbance values remained stabile.

Figure 1. Mean A_{450}-levels of serum antibodies to *App2* and *App3* (dotted line) at the top, and to *Pm* and *Ss* (dottted line) below.



Conclusions and Discussion

Antibodies in 5 week old pigs probably reflected a fading maternal immunity, but already at 8 weeks antibodies to *Pm* were recorded in 23 % of the pigs. The reactions to *Pm* preceeded those to *App2*, but increased further as pigs started to mount immune responses to *App2*. Thus, despite that the levels of antibodies to *App2* remained at moderate levels, *App2* may well have contributed to the pleuritis by giving acces to the pleura for *Pm*. The high SDs obtained for OD-values to *Pm* indicated active infections, and that pigs got infected at different times. In contrast, the slowly rising OD-values and the low SDs rather indicated an increased background exposure to *Ss* with age.

The conclusion that *Pm* on site probably to a large extent contributed to pleuritis throuh amplifying fairly mild *App*-infections stress the impact of secondary infections. As *Pm* not is considered able to penetrate an intact mucosa, also an impact of other factors is implied. Mild viral infections of unknown origin have frequently been verified in young growers (4). Such infections may have contributed to the initial colonisation of *Pm*.

References

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