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ONSET AND DURATION OF IMMUNITY OF A SINGLE DOSE OF M+PAC[®]

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Introduction

It has previously been demonstrated that the duration of immunity after a single dose of SPAH's Mycoplasma Hyopneumoniae Bacterin, M+Pac is at least 4 months (1). The purpose of this study was to evaluate the onset and 24-week duration of immunity. Because a single vaccination does not elicit a strong humoral antibody response to *M. hyopneumoniae*, antibodies in bronchiolar alveolar lavage (BAL) fluids were evaluated, as it has been reported that local antibodies may be an important component of the protective immune response to mycoplasma pneumonia (3,4).

Materials and Methods

Three-week-old pigs from a *M. hyopneumoniae* negative, high-health status herd were randomized into 2 treatment groups and vaccinated intramuscularly with either a single 2 mL dose of M+Pac or a placebo (Table 1).

Table 1: Study Design

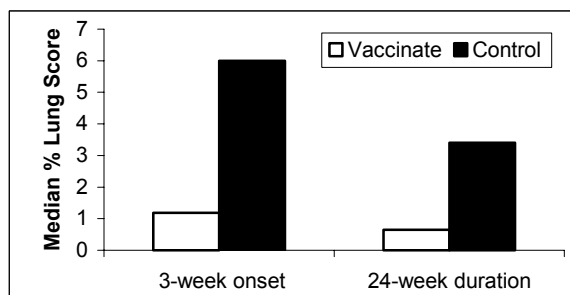
Study	No. Swine	Study Day		
		Vacc	Chall.	Necropsy
3-week onset	24 vaccinate	0	21	45
	25 placebo			
24-week duration	21 vaccinate	0	168	198
	25 placebo			

The lung homogenate challenge was administered endotracheally. Swine were monitored daily for clinical cough scores and at necropsy, the % lung consolidation was scored, based on relative lobe weight as a % of total lung weight (2). Pre-vaccination, pre-challenge, and pre-necropsy sera were tested by the DAKO blocking ELISA (DAKO Corp., Carpinteria, CA). BAL fluids at necropsy were tested for isotype-specific antibodies as previously described (3,4). Lung scores, DAKO titers, and cough scores were analyzed by Wilcoxon Exact Rank Sum Tests. BAL IgG, IgA and IgM titers were analyzed by testing means from multivariate data using the multest procedure. Significance was declared at $p < 0.05$. Analysis was performed by Diane Sweeney, PhD, SPAH.

Results and Discussion

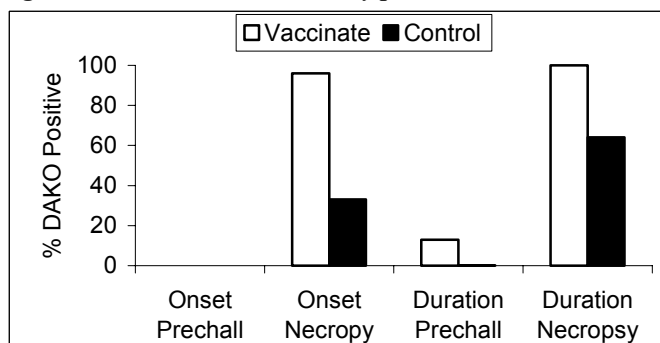
Swine were protected from challenge at both 3-weeks ($p=0.0003$) and 24-weeks ($p=0.0072$) post-vaccination as evidenced by a highly significant reduction in lung consolidation scores compared to controls (Figure 1). The % reduction in vaccinates was 80% and 81% at the 3-week and 24-week challenge, respectively.

Figure 1: *M. hyopneumoniae* Lung Consolidation Scores



The single vaccination did not elicit a positive antibody DAKO response in a majority of swine (Figure 2). However, following challenge a higher % of vaccinates were positive with a significantly higher titer than the controls ($p=0.0001$). Vaccinates in the onset study had higher levels of local IgG ($p=0.0005$) and IgA ($p=0.0142$) in BAL fluids. In the duration study, vaccinates had higher levels of IgA ($p=0.0473$) and IgM ($p=0.0323$) and a level of IgG that approached significance ($p=0.0597$).

Figure 2: Percent DAKO antibody positive.



In summary, swine were protected when challenged at 3 and 24 weeks after vaccination with a single dose of M+Pac. Consistent with previous results, a single dose did not elicit a high humoral antibody response (1). However, a strong post-challenge anamnestic response and significantly higher levels of antibodies in BAL fluids indicate that the single dose effectively primed the immune response for the subsequent challenge.

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