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PNEUMONIC CALVES < 3 MO OF AGE OFTEN FAIL TO SEROCONVERT TO ORGANISMS PRESENT IN THEIR OWN TRANSTRACHEAL WASHES

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The objective was to investigate how seroconversions were associated with homologous transtracheal wash isolations in pneumonic calves < 3 mo old. Seven (78%) of 9 bovine virus diarrhea virus-infected calves seroconverted to bovine virus diarrhea virus (2 of these calves were persistently infected). In response to a challenge with Mycoplasma sp., P. multocida, P. haemolytica, or H. somnus, at least 25% (or more) of the calves in this study failed to seroconvert. The results indicate that maternal antibodies suppressed the immune reactions and/or that the tests used could not differentiate between maternal and active immunity in < 3 mo old pneumonic calves. The results also imply that in calves < 3 mo old, it is not reasonable to attempt diagnosis through seroconversion.

INTRODUCTION

The objective of the study was to evaluate the sensitivity of paired acute and convalescent titers as indicators of infection with specific agents in pneumonic calves < 3 mo of age.

MATERIALS AND METHODS

The study population, design, selection criteria for calves, and laboratory examinations have been described previously (Virtala et al, 1996). The transtracheal wash (TTW) samples were obtained from 105 pneumonic female Holstein calves when pneumonia was diagnosed. The jugular vein samples were obtained at the same time and about 3 wk afterwards. The association between TTW isolation and homologous antibody change was studied. However, mycoplasma subspecies were not identified in the laboratory and the isolation of *Mycoplasma* sp. could be related to either *Mycoplasma dispar* or *Mycoplasma bovis* antibody changes. Statistical analyses were done with the procedure Univariable in SAS (SAS Institute Inc, 1985). The presence of at least a 4-fold rise in titer from samples taken 3 wk apart was considered evidence of seroconversion (Tizard, 1996).

RESULTS

At our primary criteria for seroconversion, 5% (*M. bovis*) to 78 % (BVD) of these young calves seroconverted to organisms present in their TTW. For most common organisms causing pneumonia in these study calves, 37% of the calves seroconverted to *M. dispar* and 62% to *P. multocida* (Table I). If a 10-fold rise in ELISA optical density value was considered as a seroconversion for *P. multocida*, *P. haemolytica*, and *H. somnus*, a slightly but not significantly lower percentage of the calves seroconverted.

Table I
Seroconversions in pneumonic calves < 3 mo of age

Organism	Minimum rise in titer to equal seroconversion	No. of TTW samples	Homologous seroconversion no.	%	95% CI (%)
BVD virus	4-fold	9	7	78	40 to 96
M. dispar	4-fold	75	28	37	27 to 49
M. bovis	4-fold	75	4	5	2 to 14
P. multocida	4-fold (10-fold)	53	33 (28)	62 (53)	48 to 75 (39 to 67)
P. haemolytica	4-fold (10-fold)	16	12 (9)	75 (56)	47 to 92 (31 to 79)
H. somnus	4-fold (10-fold)	13	8 (6)	62 (46)	32 to 85 (20 to 74)

DISCUSSION

In response to a challenge with BVD virus, *Mycoplasma* sp., *P. multocida*, *P. haemolytica*, or *H. somnus*, at least 22% (or more) of the calves in this study failed to seroconvert. Clinicians should be discouraged from sending serum samples from young calves for serologic determinations, because typically, a third or a quarter of the calves failed to seroconvert. Also, the tests that are usually used in diagnostic laboratories cannot differentiate between Ig isotypes of maternal and calf origins.

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