

Antimicrobial susceptibility of Finnish *Brachyspira pilosicoli* isolates

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Introduction

Brachyspira pilosicoli is the etiologic agent of porcine colonic spirochetosis, a diarrheal disease in growing pigs. Colitis associated with *Brachyspira pilosicoli* is less severe than swine dysentery caused by *Brachyspira hyodysenteriae*, however, antimicrobial therapy is needed on some farms to treat diarrhea in weaners and in young finishing pigs. According to principles of prudent use of antimicrobials, only effective drugs should be used.

Resistance to lincomycin and especially to tylosin was very widespread in Finnish *Brachyspira pilosicoli* isolates already during 1996-1998 (1). Decreased susceptibility to tiamulin was reported in some porcine *B. pilosicoli* isolates in Finland in the 1990's (1) and decreased susceptibility to tiamulin has been reported in Swedish *B. pilosicoli* isolates (2). This study reports the in vitro susceptibility of Finnish *B. pilosicoli* isolated since 2008.

Materials and methods

Altogether 167 *B. pilosicoli* isolates were obtained from diagnostic samples (porcine faecal samples or intestinal contents) from years 2008- 2015. The samples were submitted to the laboratory by herds that were experiencing diarrhoea problems in growing pigs. Samples originate from herds located in different regions in Finland. In this material the number of *B. pilosicoli* isolates per year varies between 11 and 31.

Minimum inhibitory concentrations (MIC) for tylosin, lincomycin, tiamulin and valnemulin were tested by VetMICBrachy method (3).

Results

Decreased susceptibility to tylosin was detected in 107 isolates (64 %), (MIC > 2 µg/ml) and to lincomycin in 49 isolates (29 %), (MIC > 4 µg/ml). All isolates were sensitive to tiamulin (MIC ≤ 1 µg/ml) and valnemulin (MIC ≤ 1 µg/ml).

Table 1. Antimicrobial sensitivity (%) in *B. pilosicoli* isolates in 2008-2015.

Antimicrobial	Sensitive (%)							
	2008 n=20	2009 n=18	2010 n=26	2011 n=11	2012 n=18	2013 n=17	2014 n=26	2015 n=31
Tylosin ^a	30	17	42	18	28	18	35	68
Lincomycin ^b	65	78	73	64	78	65	65	74
Tiamulin ^c	100	100	100	100	100	100	100	100
Valnemulin ^d	100	100	100	100	100	100	100	100

^aTylosin: S ≤ 2 µg/ml; ^bLincomycin: S ≤ 4 µg/ml; ^cTiamulin: S ≤ 1 µg/ml; ^dValnemulin: S ≤ 1 µg/ml.

Table 2. Distribution of MICs for *B. pilosicoli* isolates (n=167) from 2008-2015.

Antimicrobial	Distribution (%) of MICs (µg/ml)									
	≤0,06	0,125	0,25	0,5	1	2	4	8	16	≥32
Tylosin ^a						36	18	11	4	31
Lincomycin ^b				45	16	3	7	8	11	11
Tiamulin ^c	64	21	8	5	2					
Valnemulin ^d	86	4	7	3						

^aTylosin: S ≤ 2 µg/ml, R ≥ 8 µg/ml; ^bLincomycin: S ≤ 4 µg/ml, R ≥ 64 µg/ml; ^cTiamulin: S ≤ 1 µg/ml, R ≥ 8 µg/ml; ^dValnemulin: S ≤ 1 µg/ml, R ≥ 8 µg/ml.

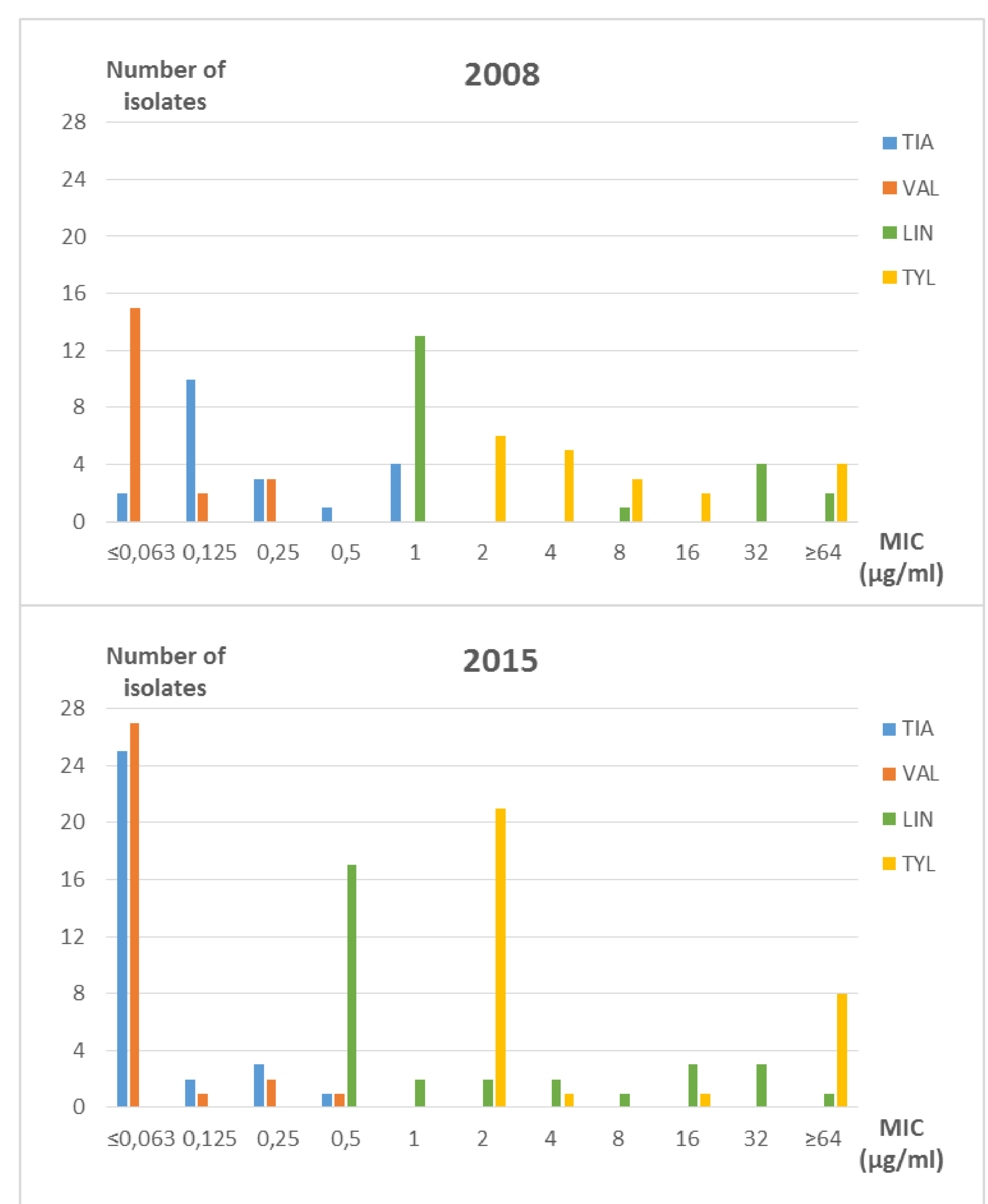


Fig. 1. Distribution of MICs for *B. pilosicoli* isolates in 2008 (n=20) and in 2015 (n=31). TYL=tylosin, LIN=Lincomycin, TIA= Tiamulin, VAL= Valnemulin.

Conclusion

The Finnish *Brachyspira pilosicoli* isolates from years 2008- 2015 showed no trend of increased antimicrobial resistance and all the isolates were susceptible to tiamulin and valnemulin. Widespread tylosin resistance and resistance to lincomycin in some isolates indicates that the use of tylosin or lincomycin for treatment of porcine colonic spirochetosis should be based on antimicrobial susceptibility testing of *B. pilosicoli* recovered from pigs with clinical enteritis.

References

- 1) Ministry of Agriculture and Forestry (2000), FINRES 1999, Report.
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