HUVEPHARMA®

HydroTrim®

High susceptibility of pig respiratory and systemic bacteria to HydroTrim®

Trial description

Objective

- Successful treatment of bacterial infections can only be achieved when bacteria are highly susceptible to corresponding antibiotics and antibiotic combinations.
- Sulfonamides and trimethoprim are classified by the European Medicines Agency (EMA) as category D, which promotes their use by veterinarians as first-line treatments compared to other families of antibiotics.
- Minimum Inhibitory Concentrations (MIC) were determined for sulfadiazine and trimethoprim (HydroTrim®), which are registered for treatment of diverse pig infections, to investigate the susceptibility of respiratory and systemic pathogens to sulfadiazine and trimethoprim alone and in combination (ratio 5:1).

Set-up

- Forty-nine pathogenic bacteria comprising 12 *P. multocida*, 14 *S. suis*, 13 *A. pleuropneumoniae*, and 10 *G. parasuis* were used for MIC determination (broth microdilution method).
- The Fractional Inhibitory Concentration Index (FICI) was determined and classified:
  - S = synergistic, FICI ≤ 0.5
  - P = partial synergistic, 0.5 < FICI < 1
  - AD = additive, FICI = 1
  - I = indifferent, 1 < FICI < 4
  - AN = antagonistic, FICI ≥ 4

Results

Table 1. MIC_{90} values and MIC ranges (µg/ml) of sulfadiazine (SD) and trimethoprim (TMP) in single and combined administration against four bacteria species

Bacteria	MIC values	Sulfadiazine	Trimethoprim	SD-TMP (5:1 ratio)
P. multocida	MIC_{90} Range	> 5120 2560->5120	256 128-256	**256** 256
S. suis	MIC_{90} Range	> 5120 160->5120	256 64-256	**256** 4-256
A. pleuropneumoniae	MIC_{90} Range	5120 80-5120	16 0.5-128	**4** 0.5-8
G. parasuis	MIC_{90} Range	2560 10-5120	128 2-128	**32** 2-64

Table 2. Combination efficacy (ratio 5:1) between sulfadiazine and trimethoprim against four bacteria species

Bacteria	№ of isolates	Com eff. S	Com eff. P	Com eff. AD	Com eff. I	Com eff. AN
P. multocida	12	0%	0%	0%	100% (12/12)	0%
S. suis	14	71.4% (10/14)	0%	0%	21.4% (3/14)	7.1% (1/14)
A. pleuropneumoniae	13	61.5% (8/13)	7.7% (1/13)	0%	15.4% (2/13)	15.4% (2/13)
G. parasuis	10	60% (6/10)	20% (2/10)	0%	20% (2/10)	0%

S = synergistic, FICI ≤ 0.5; P = partial synergistic, 0.5 < FICI < 1; AD = additive, FICI = 1; I = indifferent, 1 < FICI < 4; AN = antagonistic, FICI ≥ 4

Conclusions

- The MIC results reveal modifications and reductions in MIC_{90} values and MIC ranges due to sulfadiazine/trimethoprim combined use.
- A synergistic effect of the combination sulfadiazine/trimethoprim was found for three tested pig pathogens.
- The results illustrate the importance that both molecules sulfadiazine and trimethoprim reach sufficiently the target tissue in the animal.

HydroTrim.TB09.EN01.0525/MSD

Huvepharma EOOD. 3a Nikolay Haytov Str, 1113 Sofia, Bulgaria.
Tel +359 2 862 5331. sales@huvepharma.com

Huvepharma N.V. Uitbreidingstraat 80, 2600 Antwerp, Belgium.
Tel +32 3 288 1849. customerservice@huvepharma.com