

SIGNIFICANT DIFFERENCES IN RADIOTELEMETRIC MONITORING OF REAL-TIME FILLING CYSTOMETRY IN BARN HOUSING VERSUS METABOLIC CAGE IN GÖTTINGER MINIPIGS IN A LONG-TERM TRIAL

Hypothesis / aims of study

During radiotelemetric recordings Göttinger Minipigs are normally held in metabolic cages to monitor various urological parameters. Even though the implanted telemetric transmitter device provides a high quality real-time natural filling cystometry the influences of keeping the Göttinger Minipigs in a metabolic cage during measurement are still unknown. In this unphysiological situation, Göttinger Minipigs show atypical behaviour like lethargy or aggressiveness especially in a long-term setting, while in barn housing a more physiological behaviour can be observed. Stressors in metabolic cage as constrained movement, isolation or unaccustomed environment in contrast to the stress factors in barn housing as pairwise keeping, hierarchy, eating and play behavior can affect the function of the lower urinary tract. Therefore we started radiotelemetric recordings in barn housing and compared maximal detrusor pressures and duration of detrusor contractions in metabolic cages and barn housing.

Study design, materials and methods

The telemetric transmitter devices were implanted, pressure-sensory catheters were placed and fixed into the bladder and peritoneum of three Göttinger Minipigs. Transmitted 24 h recordings (n=3-8) were obtained in metabolic cage and barn housing. For validation micturitions were monitored by video camera and /or uroflowmetry. Maximal detrusor pressures and duration of detrusor contractions of micturition-associated events (ME) in metabolic cage and barn housing were compared.

Results

High quality real-time natural filling cystometry were obtained in both cases in barn housing and metabolic cage (mean \pm SEM). Barn housing only provided signal transmission when the Göttinger Minipigs were in their micturition corner. Maximal detrusor pressures lower significantly ($p=0,033$) from 98.32 ± 10.81 mmHg (n=26 ME) in barn housing to 67.08 ± 7.361 mmHg (n=19 ME) in metabolic cage. There was a significant ($p=0,042$) higher duration of detrusor contraction from 30.10 ± 3.452 sec. in barn housing to 51.07 ± 10.95 sec. in metabolic cage.

Interpretation of results

Radio-telemetry provides a high quality real-time natural filling cystometry monitoring in barn housing and in metabolic cage with significant differences in maximal detrusor pressures and duration of detrusor contractions.

Concluding message

Keeping animals in barn housing during repetitive long-term measurement could increase their welfare, decrease the amount of used laboratory animals and probably provide most reliable results. The significant differences in the obtained parameters show the necessity of defining standard values in reference to barn housing and metabolic cage. This needs to be considered when investigating or validating pathological disease models like bladder outlet obstruction or hyperactive bladders.

Disclosures

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