Cardiovascular Parameters in Socially Housed Cynomolgus Monkeys

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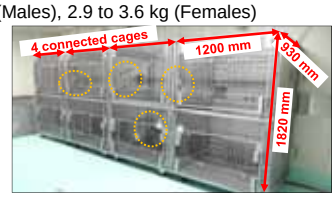
Introduction

Social housing of laboratory animals is strongly recommended in terms of animal welfare. However, animals have had to be single-housed during telemetry recording periods to avoid cross-talk between signals of legacy devices. A novel device that solved this problem has been released recently. In the present study, **we examined whether telemetry data can be acquired with the novel device and the effects of positive control drugs on cardiovascular parameters can be detected in group-housed monkeys.**

Methods

Animals
Number of animals: 4 male and 4 female telemeterized cynomolgus monkeys
Age: 3 to 4 years old, Body weight: 3.3 to 4.5 kg (Males), 2.9 to 3.6 kg (Females)
Origin: China

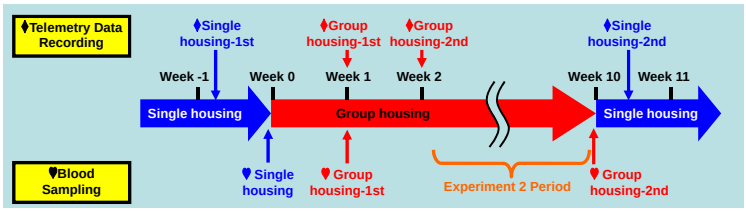
Cages and Housing
Individual cage dimensions:
930 mm (D) x 1200 mm (W) x 1820 mm (H)
•The animals were group-housed with the same sex in 4 connected cages.
Illumination: 7:00 to 19:00



Equipments
Novel device: PhysioTel™ Digital, L11 model
(Data Sciences International Inc.)
Data acquisition: Ponemah
(Ver 5.20-SP8, Data Sciences International Inc.)

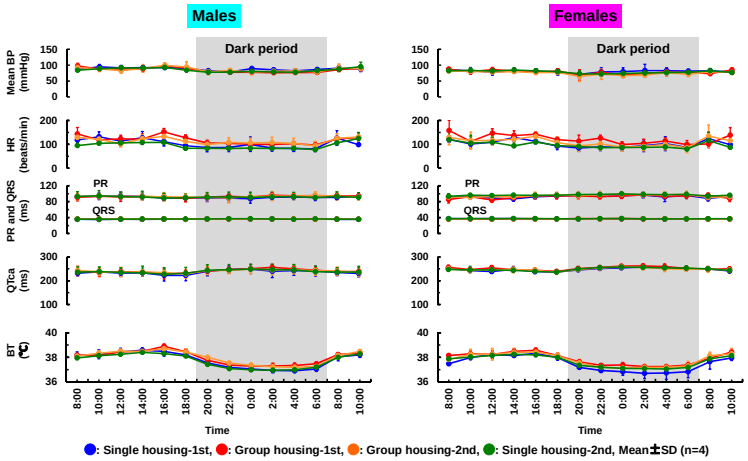
Telemetry parameters
Blood Pressure (BP), Heart Rate (HR), Epicardial ECG [PR interval (PR), QRS duration (QRS), QT interval, and QTca (Individual animal QT rate correction)], and Intra-abdominal Body Temperature (BT)

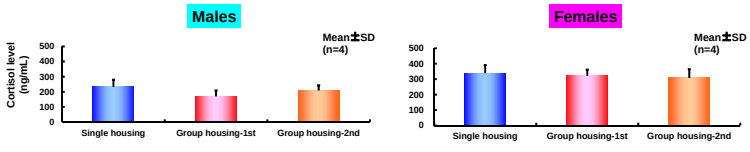
Experiment 1 <Comparison of housing conditions>



➢Telemetry Data
- Recorded for about 27 hours and the mean values of 30 minutes were calculated every 2 hours.

➢Blood Sampling
- Determined Cortisol level, Hematology (HE), and Blood Chemistry (BC)





✓ The percentage of data loss with the novel devices was less than 0.6 % in total during the telemetry recording periods, and the qualities of the blood pressure signal and ECG waveforms were sufficient for analysis.
✓ No remarkable differences were observed in any telemetry parameter or blood parameter (*Data of HE and BC not shown*) between single and group housing conditions in either sex.

[Acknowledgements]
The novel device and Ponemah were supplied by Data Sciences International Inc. and Primetech Co.

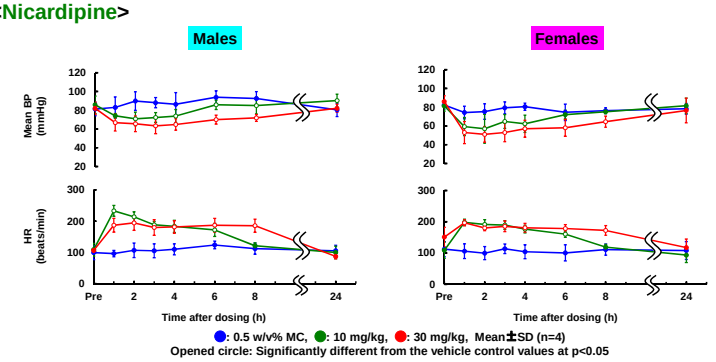
Experiment 2 <Effects of positive control drugs>

5 mL/kg, n=4/dose/sex

Articles	Dose (mg/kg)	Notes
0.5 w/v% Methyl Cellulose	-	Vehicle
Nicardipine	10 and 30	Ca^{2+} Channel Blocker
Disopyramide	20 and 40	Na^{+} and K^{+} Channel Blocker

➢Administered orally at 1-week interval
➢Telemetry Data
- Recorded for about 28 hours and the mean values of 1 minute were calculated.
➢Blood Sampling (Plasma drug concentration)
- Nicardipine (10 mg/kg) and Disopyramide (20 mg/kg)
- Conducted on different days from telemetry data recording

<Nicardipine>



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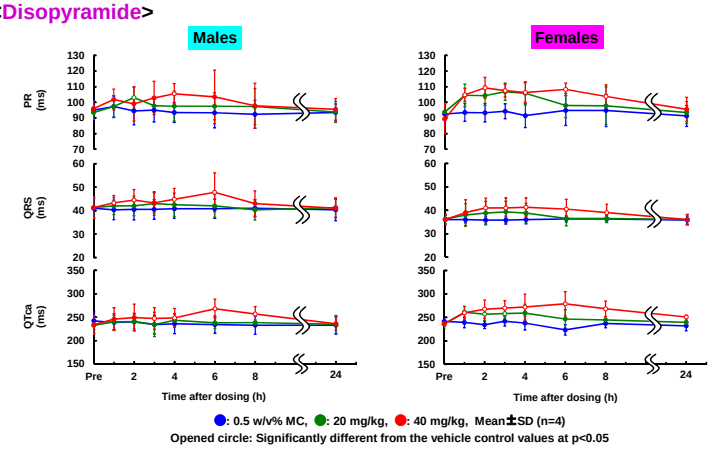
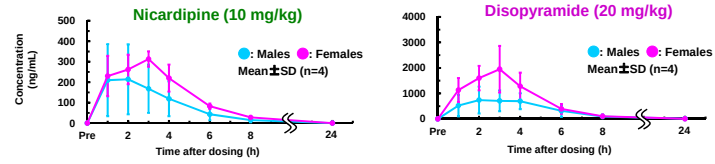


<Plasma drug concentration>



✓ The administration of positive control drugs induced the expected changes in cardiovascular parameters and the degree of these changes in group housing animals was almost the same as that in single housing animals (*in-house data*).

Conclusion

•Telemetry data acquisition from group-housed cynomolgus monkeys is feasible using the novel device and effects of new chemical entities on cardiovascular parameters can be detected.

•It is possible to conduct telemetry studies in socially housed monkeys.

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