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Blood Pressure And Heart Rate For The Four Period Adaptation In ICR Male Mice

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Abstract

Before starting blood pressure measurements in male mice, 16 h, 14, 28, 40 daysadaptation time is typically recommended. Nevertheless, sixdays after shipping, we saw hypertension CODA Monitor-Kent-Scientific) in ICR male mice. While starting blood pressure measurements in after 16 hr from transport14daysadaptation time issignificantly hypertension recommended compared with control 40 days transport . Furthermore, 28days after shipping, we recorded mid hypertension in ICR male mice.The experimental group (n = 10, 1 month ±5days old, weight (18–22 g) was delivered overnight by means of taxis, period 16 hr. Systolic blood from the tail cuff method (Coda monitor) mice have significantmild highblood pressure. Experiment group were compared to three control groups (n = 10/group), one adapted for 14days after shipment, and second adapted for 28 days after transportation third is housed mice until 40days after transportation. at least one acclimation period obtained from an inhouse colony When testing blood pressure in mice, it takes 18 weeks.Systolic blood pressure in the experiment group was 135±0.8 mm Hg one week after delivery. Because this was far greater than previously reported for this strain, acclimatization took longer. Systolic blood pressure had received the package 42days after it was shipped.fallen to 120 ± .03 mm Hg $P < 0.05$. Throughout this time, heart rate also fell from 531 ± 0.5in experimental group to 380 ± 0.2 bpm in 40 day housted male mice $P < 0.05$. systolic blood pressure in the two control groups was also lower than in the experiment group 14 days and 28 days after shipping, with the acclimated 129 ± 0.2 vs. 126 ± 0.6 mm Hg, and housed male mice 126±0.3 $P < 0.05$ respectively.

Introduction

Many hypertension researchers use mice to assess blood pressure on a regular basis. Mice from in household groups are usually employed, nevertheless, investigations necessitate obtaining male mice[1]. Most institutional animal care committees recommend allowing these mice to adapt for one week following shipping as a general rule of thumb[2]. One study found that 3 days of acclimatization was sufficient for rats, as heart rate, body weight, and activity had returned to normal by that time[3]. On the other hand, we report here on our findings of greater blood pressure in wild-type mice that had been acclimated for one week compared to mice that had been acclimatized for a week[4].

Animals and Adaptation

Experiments on animals most of the experiments were carried out on male ICR mice. 20 mice (age 1 months, weight 18±0.3–22±0.5 g) made up the experiment group. They were ordered from privacy animalslaboratory UPM, and taxied toanimal house in veterinary medicine, University of UPM overnight (16 h, 65km). Within sixdays after receiving your order,

Noninvasive blood pressure readings began at the baseline. Blood pressure was also recorded in two control groups of male mice of similar age and sex that were subjected to the same method for the first time. A second pair of icr mice same shipping route, different shipment date was allowed to adapt for 14,28 days, along with a group of in house mice. five mice per cage were housed in the same day and night cycle and temperature controlled room afterthe, ensuring a peaceful environment. Through everyday inspections, all mice seemed to be in good health, with no signs of fighting or discomfort.

Tests of blood pressure. The researchers used a proven Coda (tail-cuff approach) that depends on volumetric pressure recording devices for quantify systolic blood pressures (SBPs) (Coda 5; Cent scientific company, Germany, CT). Per day, the same experienced operator measured 4 SBP at the same time. The baseline systolic blood pressure was measured once all mice had been habituated to the systolic blood pressure examinations for six days those values were recorded.The baseline SBP was then measured. as the mean of the next three days Furthermore, each day,the average SBP of the mouse on that day was calculated by averaging ten acclimation cycles and fifteen measurement cycles. Even during three testing days, there was no decrease in SBP, indicating that no more adaptation took place.

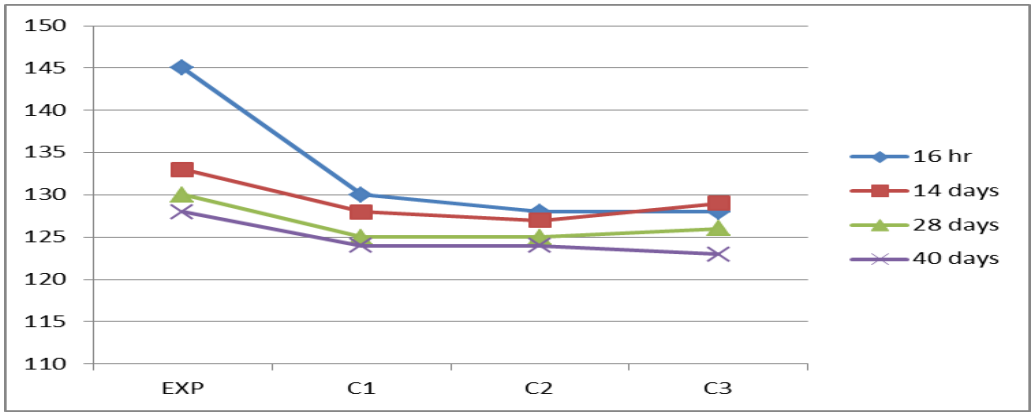

Figure (1) Systolic blood pressure mmHg values (mean±SE) (n=10) different adaptation

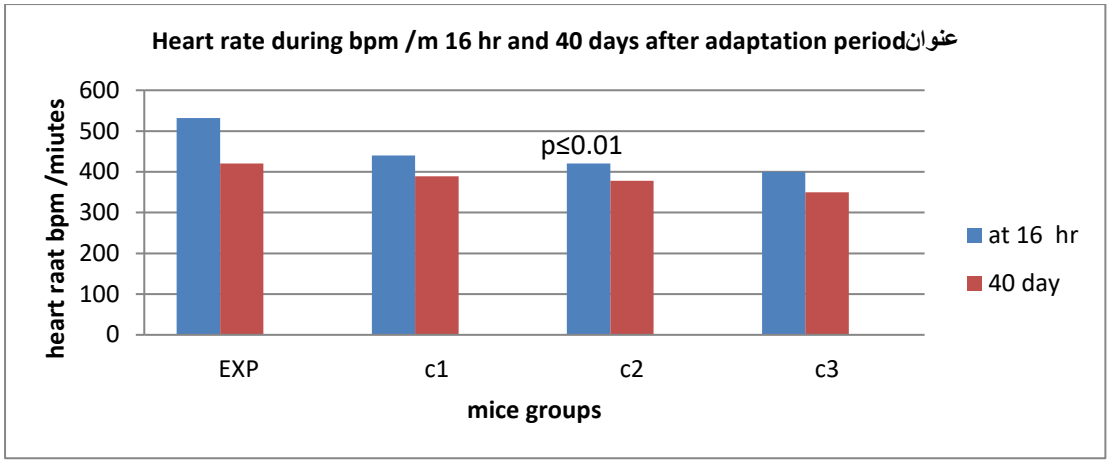

Figure (2) Heart rate bpm/m n=10 (mean±SE) during 16 hr after transport and 40 days housed mice

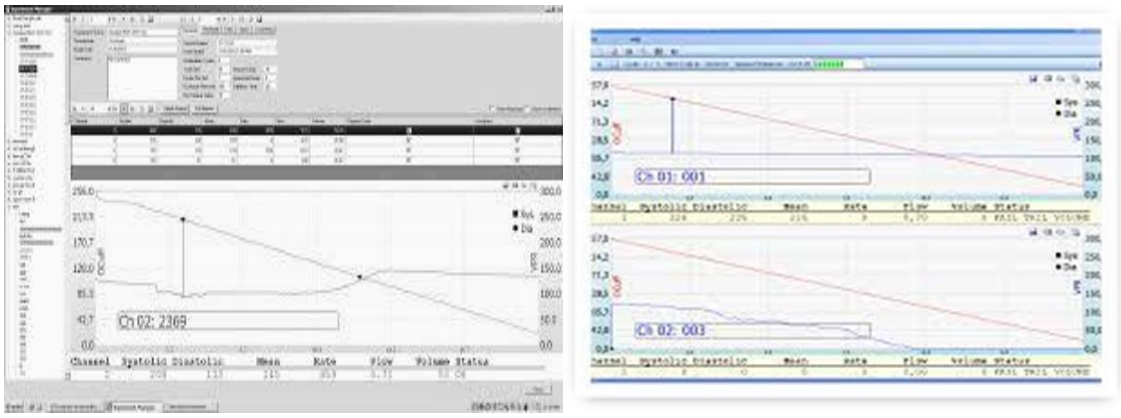

Figure (3) protocol blood pressure measurement in male mice

Results

Systolic blood pressure in the experimental group was expected to be substantially elevated than expected for this strain of mice 14days after transport mean 130±0.04 smmHg, Figure 1) Furthermore, during the 14 days week following delivery, the mice did not gain weight (18±0.3-22±0.5 g). The adaptation period was extended since we felt these observations were related to the latest cargo. Systolic blood pressure had dropped to 123 mmHg weeks after transport P ≤ 0.05 using paired T-test vs. the mean systolic blood pressure at 16 hr,14,28and 40 week, Figure 1). Likewise, the mean heart rate dropped from 531 ±0.5 to 380±0.2 bpm over this time (P≤ 0.01 using paired T-test). Due to it's arguable that stress related.The control group's mean systolic blood pressure after 40 days of adaptation was considerably lower than the experiment group's mean systolic blood pressure 14days after transpot (135±0.8 vs. 123±0.3, P 0.05 by independent T-test, Figure 1). Additionally, 14days after adaptation, the mean systolic blood pressure of the third control group obtained from our in-house mice was significantlydecrease than the experiment group (1 29±0.4 vs. 135 ±0.8, P 0.05 by independent T-test, Figure 1). Systolic blood pressure was slightly but not

substantially higher 16hr after delivery in the male mice compared to 40days after transport (126±0.5 vs 135±0.8).

Discussion

Icrmale mice had their blood pressures monitored for at least a week after shipping (Figure 1). Systolic blood pressure had decreased and was comparable to that of in housed mice 40days after transport. Systolic blood pressure was somewhat higher in a separate group of mice that had been acclimated for16hr,14 and28days, but significantly higher than in mice that had been compared for 40 days after transport (Figure 1). These findings were made with male mice, which are one of the most extensively utilized animal study strains[3].

Even though directly transport effect appears to be a viable reason for our observations, other aspects should be examined as well. The higher blood pressures could have been caused by environmental factors connected with shipping or the assignment to group housing following shipment. The experiment and control groups of male mice were transported in separate shipments[5]. As a result, the experiment group's shipment may have been more stressful, resulting in increased blood pressure immediately following delivery. Nevertheless, the fact that systolic blood pressure in a separate group of mice was still higher after 40days of adaptationrecommends that lowering blood pressure during adaptation is ineffective.It's also crucial to examine the consequences of the blood pressure measuring method. Blood pressure measurements using a separate tail-cuff approach (coda system- hot plate) that depends on plethysmography, for example, revealed that a high fructose diet caused hypertension in rats, but telemetry could not confirm this impact[6]. Conversely, us in house mice were not hypertensive (Figure 1), despite the fact that tail cuff blood pressure was also measured for the first time[7]. As a result, an influence of the blood pressure measuring method seems less likely. Tail-cuff blood pressures were taken according to protocol which included a three-day acclimatization period before beginning "official" readings[8].

We couldn't discover any prior research on the effects of shipping on blood pressure. In a recent study, though, male mice showed a higher stress reaction than in house mice[7]. For up to 40days following transport, the male mice had raised glucocorticoid levels and enhanced monoaminergic activity[8]. Although blood pressure was not evaluated in that study, it's possible that an activated neuroendocrine system contributes to elevated blood pressure upon shipping. Another study found that white blood cells, electrolytes, and enzymes in rats immediately after shipping differed significantly from rats who were permitted to roam freely[6].In conclusion, vendor-derived mice are hypertensive one week after shipping, become normotensive after three weeks, and do not recover to in-house levels until six weeks have passed. As a result, mice must be given at least 3 weeks to adapt after shipping. It will be interesting to discover if this shipping-related increase in blood

pressure is found in other mouse strains, and if the same results are achieved using a different blood pressure measurement technique, such as telemetry. Nonetheless, we assume that this data is crucial.Whether designing and carrying out investigations that have included measurement in mice, for the high blood pressure scientific community.

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Disclosure

There were no conflicts of interest revealed by the authors.

References

1-Fox JG, Barthold SW, Davisson MT, Newcomer CE, Quimby FW, Smith AL (eds). The mouse in biomedical research. Academic Press Publications, Elsevier: London, 2007.

2-Capdevila S, Giral M, Ruiz de la Torre JL, Russell RJ, Kramer K. Acclimatization of rats after ground transportation to a new animal facility. Lab Anim 2007; 41:255–261.

3-Feng M, Whitesall S, Zhang Y, Beibel M, D'Alecy L, DiPetrillo K. Validation of volume-pressure recording tail-cuff blood pressure measurements. Am J Hypertens 2008; 21:1288–1291.

4-Feng M, Deerhake ME, Keating R, Thaisz J, Xu L, Tsaih SW, Smith R, Ishige T, Sugiyama F, Churchill GA, DiPetrillo K. Genetic analysis of blood pressure in 8 mouse intercross populations. Hypertension 2009; 54:802–809.

5-D'Angelo G, Elmarakby AA, Pollock DM, Stepp DW. Fructose feeding increases insulin resistance but not blood pressure in Sprague-Dawley rats. Hypertension 2005; 46:806–811.

6-Olfe J, Domanska G, Schuett C, Kiank C. Different stress-related phenotypes of BALB/c mice from in-house or vendor: alterations of the sympathetic and HPA axis responsiveness. BMC Physiol 2010; 10:2.

7-Bean-Knudsen DE, Wagner JE. Effect of shipping stress on clincopathologic indicators in F344/N rats. Am J Vet Res 1987; 48:306–308.

8- Kurtz TW, Griffin KA, Bidani AK, Davisson RL, Hall JE; Subcommittee of Professional and Public Education of the American Heart Association. Recommendations for blood pressure measurement in humans and experimental animals. Part 2: Blood pressure measurement in experimental animals: a statement for professionals from the subcommittee of professional and public education of the American Heart Association council on high blood pressure research. Hypertension 2005; 45:299–310.