Nω-Nitro-L-Arginine Methyl Ester Hydrochloride (L-NAME) Induced Hypertension in Pregnant Rat Model: An Analysis on the Effectiveness of Administration Methods to Induce High Blood Pressure in Pregnancy.

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ABSTRACT

Background: Hypertensive pregnancy disorder (HDP) contributes to high percentage for both maternal and foetal morbidity and mortality but there is no definite treatment to cure this disease. A history of having HDP is a known risk factor for women's cardiovascular disease later in their life even though blood pressure normalizes during postpartum period. L-NAME is a drug that has been used to pharmacologically induce hypertension by inhibition of nitric oxide synthase (NOS). In the previous study, there are various administration methods used to induce hypertension in pregnant rat model by using L-NAME, but they produced inconsistent outcomes. **Objective**: This study aims to establish hypertension in a pregnant rat model by using L-NAME. **Materials and Methods**: Twenty-four female Sprague-Dawley (SD) rats were randomly assigned to four groups (n=6 in each): Control- non-pregnant (C), control-pregnant (P), non-pregnant-L-NAME (CL) and pregnant-L-NAME (PL). The pregnant groups were mated with adult male SD overnight and Day 0 of gestation is considered by presence of sperm in the vaginal smear. On Day 10 of gestation, the treated groups (PL and CL) were given 125mg/kg/day of L-NAME via subcutaneous route until the day of delivery and then the animals were sacrificed at Day 30 postpartum. A series of blood pressure were measured via pre-warmed tail-cuff method. The mean number and weight of the litters were recorded. **Result**: Introduction of L-NAME via subcutaneous for 12-13 consecutive days to treated group resulted in significant increase of the mean atrial pressure (MAP) on Day 14 and Day 21 of gestation for both treated groups compared to their controls (P and C group respectively). During postpartum period, the MAP of PL and CL decreased but not statistically significant. The mean number and weight of the litters for both P and PL showed no significant differences. **Conclusion**: This method has successfully induced high blood pressure which fits the criteria of HDP definition, and it was relatively safe for the foetus. We highly recommend these findings regimen and the administration methods to induce high blood pressure in pregnancy-associated hypertension animal model.

Keywords: L-NAME, hypertension, pregnant, animal model

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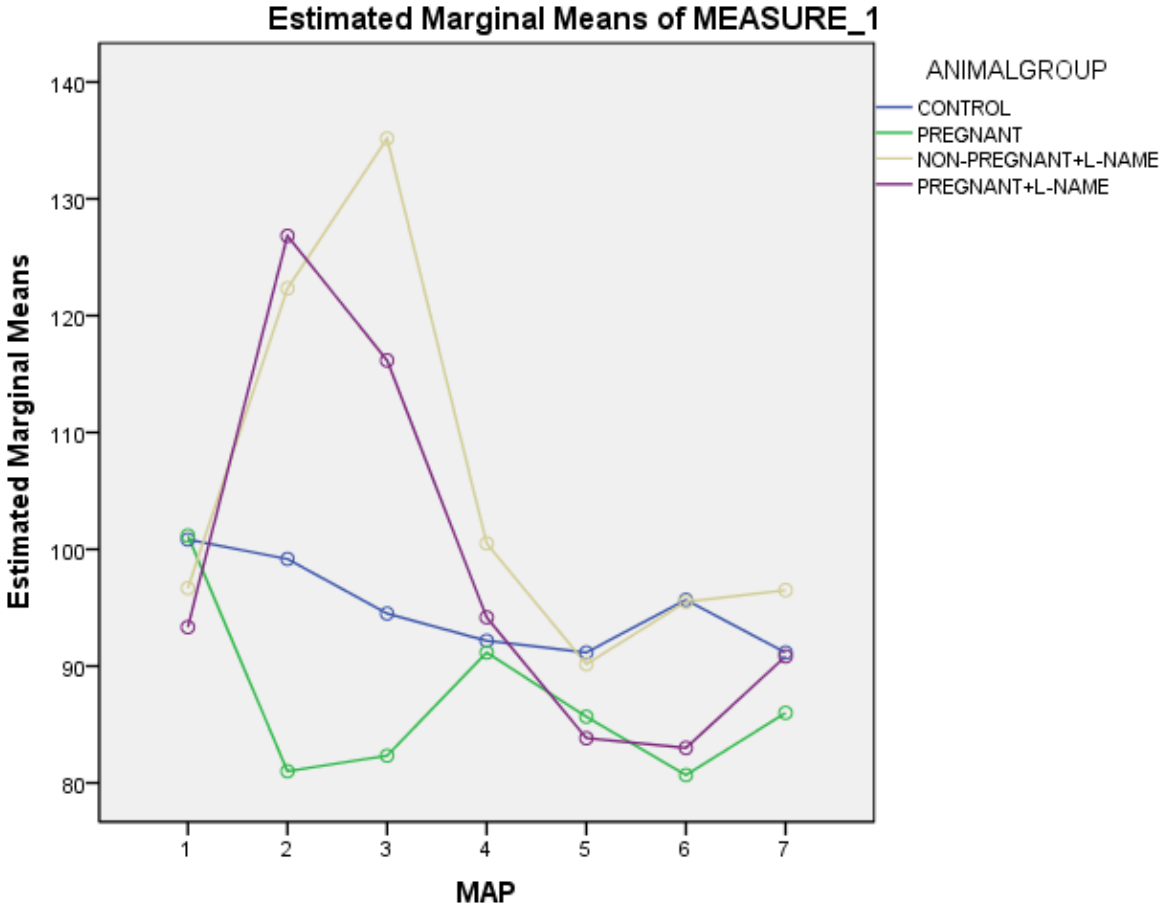
Estimated Marginal Means of MEASURE_1
Estimated Marginal Means
140
130
120
110
100
90
80
1
2
3
4
5
6
7
MAP
ANIMALGROUP
CONTROL
PREGNANT
NON-PREGNANT+L-NAME
PREGNANT+L-NAME