4th International Congress of Turkish Neuroendocrinology Society | ISTANBUL
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The influence of maternal separation on depressive symptoms and energy homeostasis in young adult male rat offspring subjected to chronic social defeat stress

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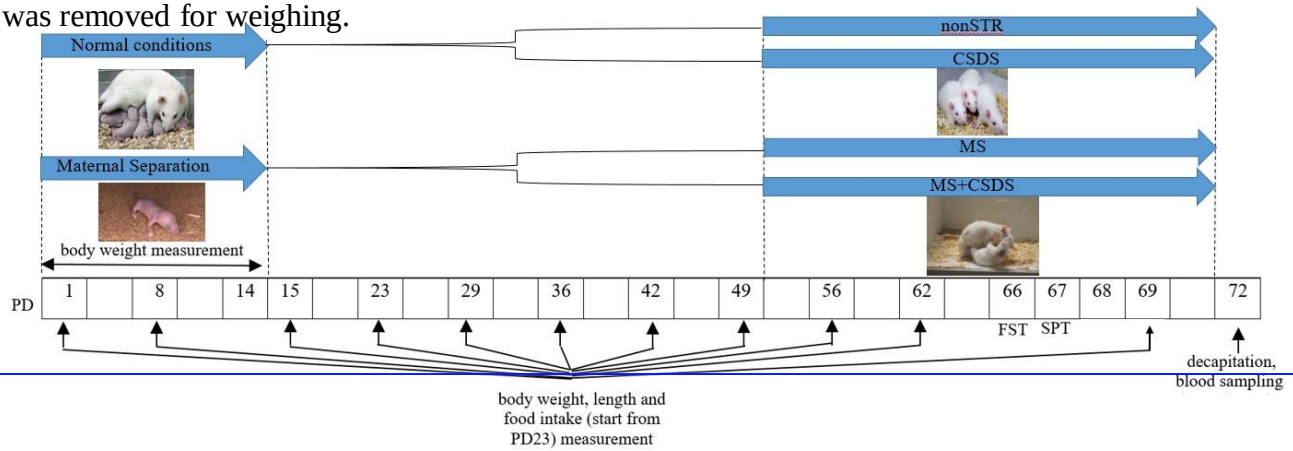
AIM: Early life stress is known to increases the risk to develop stress related psychopathology such as depressive disorders. Moreover, chronic social defeat stress (CSDS) has been often used to induce depressive like behavior in rodents.

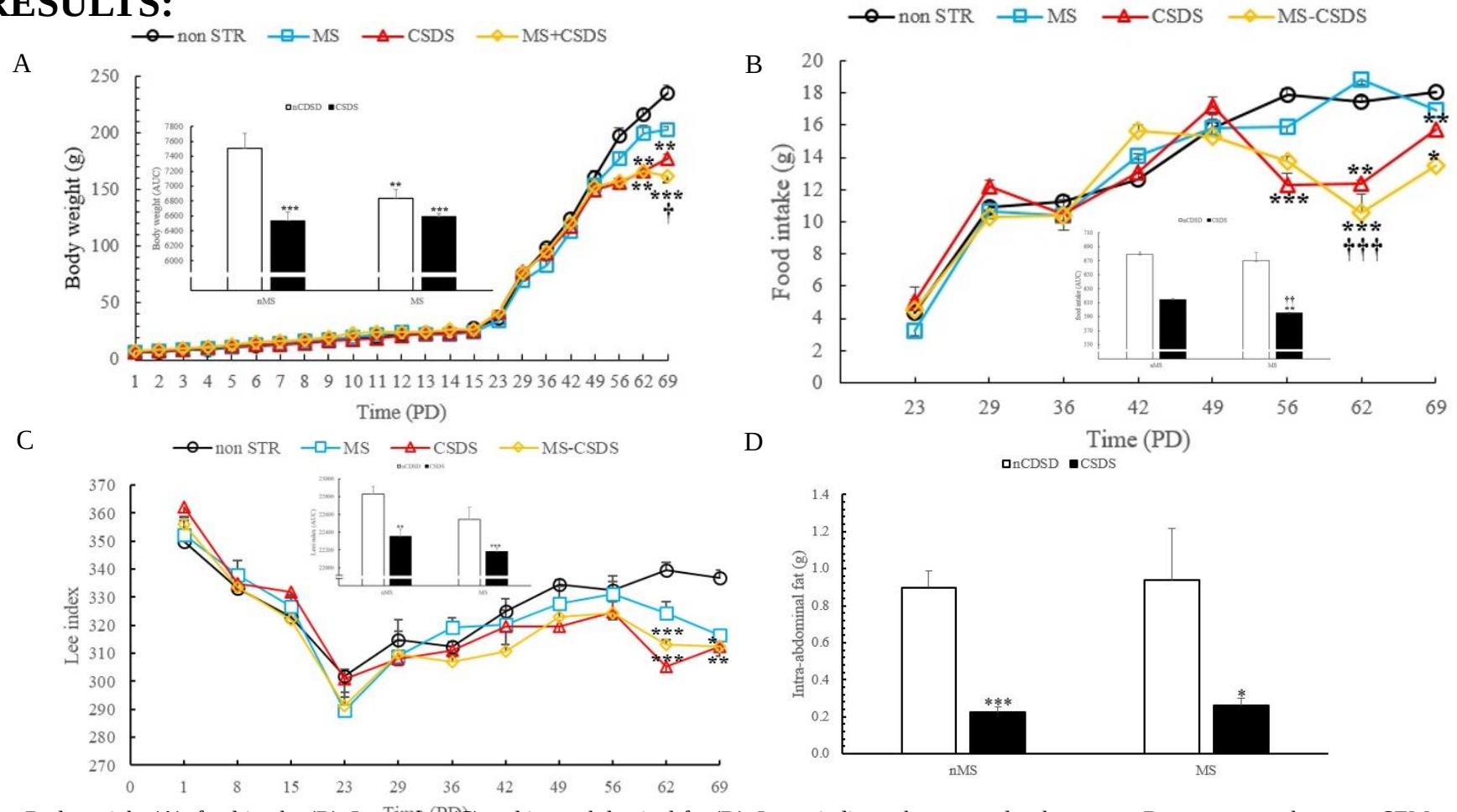
In line with this association, this study was designed to determine how stress challenges experienced in early life may interfere with the development of depression and metabolic disturbance in response to chronic social defeat stress in adulthood.

METHODS: Male Wistar rat offspring were exposed to either maternal separation (MS) or left undisturbed with their mothers (nMS). Maternal separation was conducted 3 h per day from PD 1 to PD 14. Then at puberty (PD 50), the animals of each group were either left undisturbed in the standard group housing (nCSDS) or underwent chronic social defeat stress (CSDS), based on resident-intruder paradigm, for 3 weeks. Thus, totally there were 4 groups (n=10/group). Body weight was measured on a daily basis for the first 14 days and then it was measured weekly from PD 15 onwards.

Body length and food intake were weekly recorded from PD 1 and PD 23, respectively, onwards to calculate $Lee\ index = \sqrt[3]{body\ weight\ (gr)} \times 1000\ /nasoanal\ length\ (mm)$. Within the last week of the experiment, forced swimming test (FST) and sucrose preference test (SPT) were respectively done on PD66 and PD67 to evaluate depressive like behaviors. Finally, the animals were decapitated and their blood was collected to measure plasma concentrations of leptin. Also intra-abdominal fat was removed for weighing.

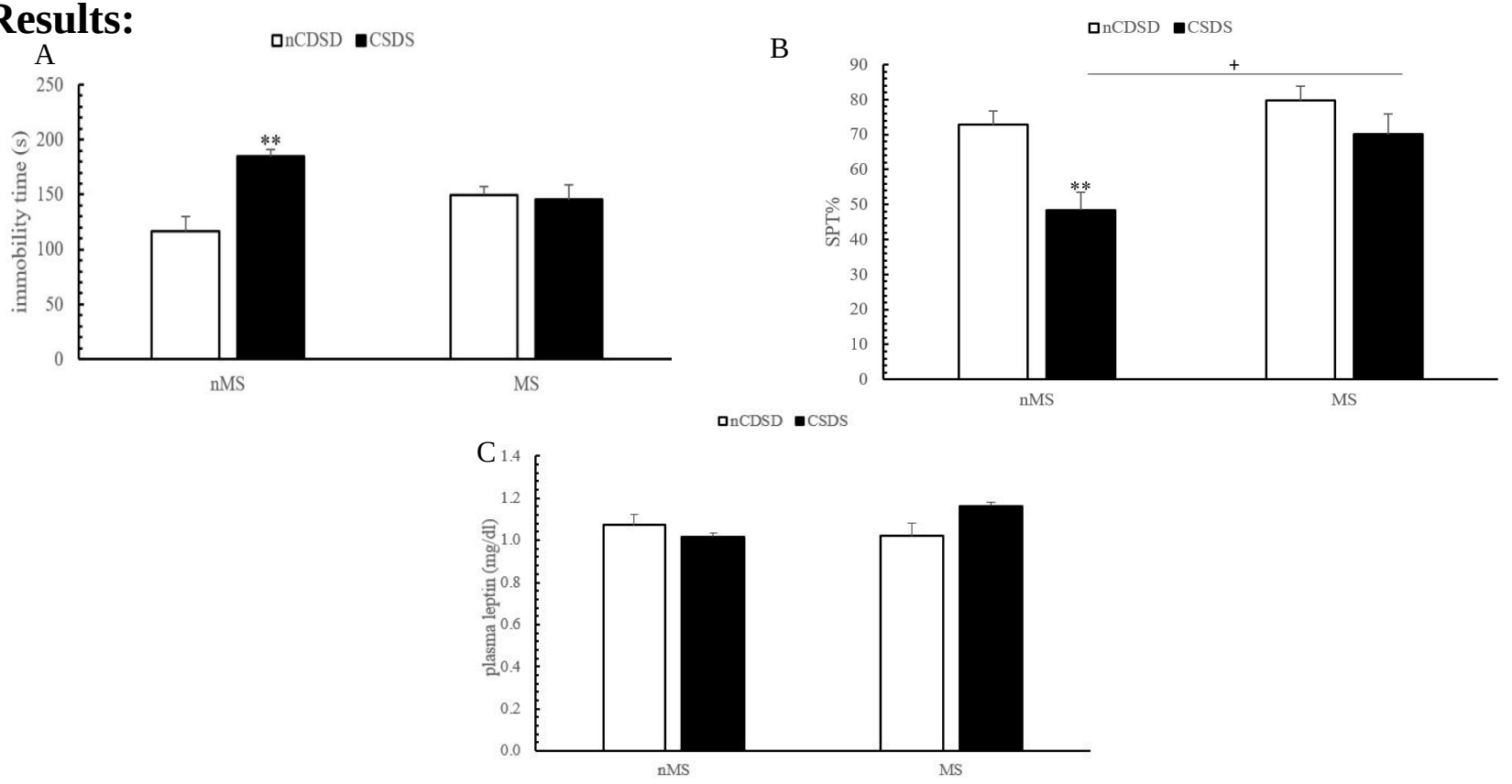


RESULTS:



Body weight (A), food intake (B), Lee index (C) and intra-abdominal fat (D). Insets indicate the area under the curves. Bars represent the mean±SEM (n=10/ group). *, † Statistically significant difference versus nonSTR and MS groups, respectively. Values and columns are mean± SEM.

Results:



Total immobility time during a 5 min exposure to the forced swimming test (A) and sucrose preference % (B). Bars represent the mean±SEM (n=10/ group). **p<0.01 significantly different versus the nonSTR group. +p<0.05 Statistically significant difference comparing the CSDS and MS+CSDS groups.

CONCLUSION:

Our study shows that early life adversity does not necessarily result in increased vulnerability to stress. Our data about depression like behavior support the match/mismatch notion that being raised in a stressful environment even might prepares the offspring to better cope with a challenging adult environment and emphasize the role of early life experiences in shaping adult responsiveness to stress. On the other hand, impaired energy homeostasis induced by adulthood social challenges were not significantly affected by early life stress.