Immobilization stress

Immobilization stress is a type of psychological or physical stress that is induced by restraining or immobilizing an animal or human subject for a specific period. This stressor is commonly used in laboratory settings to study the physiological and behavioral responses to stress.

In research studies, immobilization stress typically involves restraining an animal (such as a rodent) or a human subject in a small container or apparatus that prevents them from moving for a predetermined period. This immobilization can be done using specialized equipment or even by physically restraining the subject's movement.

The purpose of immobilization stress in research is to induce a controlled stress response, which can be used to investigate various aspects of stress physiology, including:

Hormonal Responses: Immobilization stress can lead to the release of stress hormones such as cortisol in humans and corticosterone in animals. Researchers can measure these hormone levels to assess the intensity and duration of the stress response.

Behavioral Responses: Researchers observe and record the behavioral changes that occur during and after immobilization stress. These can include changes in activity levels, grooming behaviors, and more.

Physiological Changes: Various physiological parameters like heart rate, blood pressure, and body temperature may be monitored to assess how the stressor affects the subject's physiology.

Immune Function: Researchers may study the impact of immobilization stress on immune function, as chronic stress can influence immune responses.

Neurological and Cognitive Effects: Immobilization stress can also be used to investigate the impact of stress on cognitive function, memory, and other neurological processes.

It's important to note that immobilization stress is a controlled and ethical way to study stress responses in a laboratory setting, and it is used to gain insights into the physiological and psychological effects of stress. However, it is typically not used as a form of treatment or therapy, as excessive or prolonged stress can have negative health consequences.

A investigation examine the role of immobilization stress influencing Parkinson's disease brain pathology inmodel experiments. In one previous report they found that mild traumatic brain injury exacerbate Parkinson's disease brain pathology and nanodelivery of dl-3-n-butylphthalide either alone or together with mesenchymal stem cells significantly attenuated Parkinson's disease brain pathology [1)].

1)

Feng L, Sharma A, Wang Z, Muresanu DF, Tian ZR, Lafuente JV, Buzoianu AD, Nozari A, Li C, Zhang Z, Lin C, Huang H, Manzhulo I, Wiklund L, Sharma HS. Nanowired delivery of dl-3-n-butylphthalide with antibodies to alpha synuclein potentiated neuroprotection in Parkinson's disease with emotional stress. Int Rev Neurobiol. 2023;171:47-82. doi: 10.1016/bs.irn.2023.06.005. Epub 2023 Jul 20. PMID: 37783563.