Exposure to just 6 mins of uncontrollable shock 24 hrs following contusion injury impairs locomotor recovery, delays recovery of bladder function, increases mortality and spasticity, and leads to greater tissue loss at the injury epicenter. These effects could be related to a stress-induced release of corticosterone as uncontrollable shock has been shown to elevate corticosterone levels in intact rats and corticosterone exacerbates cell death in the hippocampus following injury. The present experiment examines the impact of a contusion injury, and shock treatment, on corticosterone levels.

Subjects received a moderate contusion injury (12.5 mm drop) using the NYU impactor. Twenty-four hours later a baseline measure of locomotor performance was taken using the BBB scale. Subjects received 6 mins of uncontrollable tailshock (1.5 mA, 80 ms duration with average ITI of 2 secs) or an equivalent amount of restraint. Blood was drawn immediately from the saphenous vein into a heparinized microcentrifuge tube and the samples were spun at 1000 x g for 15 minutes within 30 minutes of collection. Six, 24, or 72 hrs later, locomotor performance was re-assessed and subjects were sacrificed. Trunk blood was collected into a blood collection tube containing EDTA. Corticosterone levels were determined in all blood samples using an ELISA (Correlate-EIA kit, Assay Designs, Ann Arbor, MI, sensitivity = 26.99 pg/ml).

Baseline BBB scores were consistent across groups with an average of 5.44 (± 0.07). Uncontrollable shock caused a decline in BBB scores on Day 2 that persisted throughout the testing period. Corticosterone levels were elevated immediately after shock treatment; however, this elevation depended on the time of day at which shock occurred. No other differences were noted except an overall decrease in corticosterone levels over time. Studies are currently underway examining other factors affected by stress.

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