

Brain accumulation of depleted uranium in rats following 3- or 6-month treatment with implanted depleted uranium pellets.

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Depleted uranium (DU) is used to reinforce armor shielding and increase penetrability of military munitions. Although the data are conflicting, DU has been invoked as a potential etiological factor in Gulf War syndrome. We examined regional brain DU accumulation following surgical implantation of metal pellets in male Sprague-Dawley rats for 3 or 6 mo. Prior to surgery, rats were randomly divided into five groups: Nonsurgical control (NS Control); 0 DU pellets/20 tantalum (Ta) pellets (Sham); 4 DU pellets/16 Ta pellets (Low); 10 DU pellets/10 Ta pellets (Medium); 20 DU pellets/0 Ta pellets (High). Rats were weighed weekly as a measure of general health, with no statistically significant differences observed among groups in either cohort. At the conclusion of the respective studies, animals were perfused with phosphate-buffered saline, pH 7.4, to prevent contamination of brain tissue with DU from blood. Brains were removed and dissected into six regions: cerebellum, brainstem (pons and medulla), midbrain, hippocampus, striatum, and cortex. The uranium content was measured in digested samples as its ²³⁸U isotope by high-resolution inductively coupled plasma-mass spectrometry. After 3 mo postimplantation, DU

significantly accumulated in all brain regions except the hippocampus in animals receiving the highest dose of DU ($p < 0.05$). By 6 mo, however, significant accumulation was measured only in the cortex, midbrain, and cerebellum ($p < 0.01$). Our data suggest that DU implanted in peripheral tissues can preferentially accumulate in specific brain regions.
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