

Abstract

The consequences resulting from the combined exposure to methadone and ethanol during a time period equivalent to the third trimester brain growth spurt was the purpose of this study. Rat pups were treated on postnatal days 6–10 and sacrificed on postnatal day 11. Body weight along with the heart, liver, kidneys, whole brain, cerebrum, cerebellum, and brain stem weights were measured. The impact of nutritional factors were identified by delivery of the drug solutions in one of two intubation vehicles differing in both caloric density and composition. Ethanol and methadone in combination result in significantly increased detrimental effects compared to methadone alone only when possible nutritional compromise was present. The combined effect of both drugs significantly inhibited body growth and the development of all brain regions studied. Neither drug alone, nor in combination, produced significant inhibition of growth in the liver, heart, or kidney. The nutritional status of the pup, as represented by vehicle composition, was able to modify the specific drug effects and suggests that nutritional status can mask or enhance the determination of specific drug effects.