CORRELATIONS BETWEEN LEVEL OF CONSCIOUSNESS OF HEAD INJURY PATIENTS AND NEUROTRANSMITTERS IN CEREBROSPINAL FLUID, PLASMA, URINE AND PHYSIOLOGICAL PARAMETERS

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ABSTRACT

Data are obtained from head-injury subjects with different degrees of consciousness, mostly male, 25 - 35 years old on average, and on average of 6 - 14 days after head injury. Most damages are hematoma and concussion of frontal, temporal and parietal lobes of the brain. In general, there is greater degree of brain damage in patients with higher degree of unconsciousness. Points of time of sample collections indicate chronic instead of acute effects of brain trauma on the data obtained. There is no significant change in CSF, plasma-NA, DA, and 5-HT concentrations from the control in most stages of consciousness except there is significant reduction in the CSF-NA concentration of semicoma (grade III) subjects. There are significant decreases in the 24 hr. urine content of NA, DA, and 5-HT in coma (grade IV) and some other stages of consciousness from the control or of the alert (grade I) head injury subjects. This indicates general degeneration of many neurotransmitter

containing neurons caused by chronic effects of brain trauma, and there is rough correlation with degrees of unconsciousness. There is significant reduction in the CSF NA/5HT concentration ratio, increase in CSF - 5HT/DA concentration ratio, and slight but not significant decrease in CSF - NA/DA concentration ratio from the control. There is rather good correlations between CSF-NA/5HT and CSF - 5HT/DA concentration ratios with different degrees of unconsciousness, this may indicate some not yet clear interactions between the reticular activating systems (RAS) and the 5HT, NA and DA containing neuronal system. There is slight increase in the CSF - protein concentration, but poorly correlates with the degrees of unconsciousness. There are significant increases in heart rates in brain damaged subjects compared to the alert (grade I) head injuried subjects. No significant change was detected in the blood pressure in different stages of unconsciousness. There is poor correlation between CSF-protein concentration, CSF-pressure with CSF - DA, NA and 5 - HT concentrations. Few good parameters may be useful in the determination of the degree of consciousness of head-injuried subjects namely, 24 hr. urine noradrenalin (NA), dopamine (DA) and 5 - hydroxytryptamine (5 - HT) contents; CSF - NA/5 - HT, 5-HT/DA ratios, pulse rates and the CSF protein concentration probably show the degree of brain damage from head injury.

Biography

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