



## Pathology & Biology Section – 2008

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### **G50 Diffuse Axonal Injury in Medico-Legal Practice**

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The goal of this presentation is to present data that will provide attendees with the important medicolegal and clinical characteristics of diffuse axonal injury in closed head trauma that may contribute ultimately to fatal outcome.

The presentation will impact the forensic community by the fact that in cases of closed head trauma, diffuse axonal injury (DAI) may contribute to overall brain damage and treatment outcome. On the other hand, these results indicate that in the cases of closed head injury, fatal outcome occurs over a shorter period if DIA is present without contusions of the brain.

Diffuse axonal injury (DAI) is a form of neural damage in close head trauma that may contribute to overall trauma severity as well as the prognosis and course. For that reason, an autopsy study was performed to analyze the extent and other important forensic and clinical characteristics of DAI.

The study was carried out prospectively during two years period when 3,012 autopsies were performed. According to defined criteria, 30 autopsy cases of closed head trauma were selected (study group), while a corresponding number of cases formed control group. Whole brain samples were fixed in formaldehyde and subsequently studied macroscopically and microscopically.

Data were obtained from medical records and autopsy findings. A contusion index (CI) was used for assessment of brain contusions. Tissue density, as a measure of myelin sheath damage, was analyzed on luxol fast blue (LFB) stained sections of corpus callosum (CC) by laser scan densitometry. The obtained results were analyzed by means of appropriate statistical methods.

Optic density of LFB stained CC slices depends on myelin quantity. Optic density of CC in controls was  $1.02 \pm 0.05$ , while in studied subjects it was  $0.96 \pm 0.08$ . Observed difference in optic density of CC histological slices was proved to be of statistical significance ( $t=4.0035$ ;  $p<0.05$ ). In cases with higher CI, i.e., where contusion injuries were more severe, optical density of CC was slightly lower in comparison to the cases of less severe contusions, and cases where brain contusions were absent. Optical density of CC is significantly lower in cases with survival period up to 24 hours.

#### **Medico-Legal Aspects, Diffuse Axonal Injury, Trauma**