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S100B protein expression in human heart of overdose-related deaths: A new forensic marker?

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Objective: Medico-legal evaluation of the occurrence of S100B protein expression in human heart and it's correlation with drug-related death.

Method: Left ventricular samples from 74 serial forensic autopsies (15 overdose-related deaths; 59 non overdose) from 2007 to 2010 were collected. The subjects tested were subdivided into two main groups: overdose group (15 subjects; cocaine, heroin or polypharmacological admixtures including ecstasy) and non-overdose group (59 subjects; traumatic and non traumatic deaths). Traumatic group was also subdivided into three subgroups (sidearms, firearms, drowning). Tissue sections were stained with hematoxylin-eosin and immunostained for S100B protein by a commercial antibody.

Results: S100B protein was detected in heart samples of all 15 cases of overdose-related deaths: immunoreactivity was mainly observed in the cytoplasm of cardiomyocytes and as globular deposits in the interstitial spaces. No reactivity at all or a very weak result for S100 protein was found in the cardiomyocytes of the 59 subjects dead for other causes. In all S100B positive cases oedema, wavy arrangement of cardiomyocytes were observed.

Conclusion: Our preliminary data show that S100B protein is accumulated in injured cardiomyocytes during overdose-related death. Given the almost absence of S100B protein in the heart of subjects died for causes independent from drug addiction and the presence of microscopic signs of cardiac suffering, we propose the use of S100B immunopositivity as a new ancillary screening tool for the postmortem diagnosis of overdose-related cardiac death.

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