

Determining the Manner of Death Using Fourier Transform Infra-red Microspectroscopy: A Preliminary Study

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Background and Objective: Suicide is an important public health problem that has a strong association with psychopathology and particularly with mood disorders. However, there are no specific tests that can determine the manner of death (suicide, homicide and accident). Therefore, discovery of new promising diagnostic tools may be the alternative approach for manner of death determination. This study is aimed to determine the manner of death in post-mortem brain tissue from forensic cases by using Fourier Transform Infrared (FTIR) microspectroscopy.

Methods: Post-mortem prefrontal cortex tissue (Brodmann area 10) was derived from five suicide and

seven control subjects. Samples were cryosectioned at a thickness of 5 μ m onto IR reflective (MirrIR) slides. FTIR images were collected in the microscopic modes and separated data sets by cluster analysis.

Results: Cluster analysis of second-derivative FTIR spectra in the 1,413-1,793 cm^{-1} range resulted into two clear clusters corresponding to suicide and control subjects with an accuracy of 83.3%.

Conclusions: The findings of this study demonstrate that FTIR microspectroscopic and cluster analysis may provide a simple and accurate for determination of the manner of death in forensic subjects.

Keyword: Fourier transform infrared, Manner of death, Suicide