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DETERMINATION OF POST-MORTEM INTERVAL BY POLARIZATION IMAGES OF CEREBRO-SPINAL FLUID FILMS OPTICAL STRUCTURE CHANGING

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Post-mortem interval determination is one of the main issues of forensic practice. Non-invasive optical diagnostic methods (photometric, polarization and correlation techniques) of biological tissue structure assessment are the most perspective in this area.

The purpose of the work. Development and testing of the two-dimensional Stokes-polarimetric mapping of biological layers method to evaluate accuracy of the post-mortem interval (PMI) assessment using statistical analysis of postmortem changes dynamics of the coordinate distributions values of polycrystalline films of liquor (PFL) images polarization ellipticity (PE).

Materials and methods. Objects of investigation are PFL, taken in 29 corpses with accurately known time of death and 6 healthy volunteers. The cause of the death was cardiovascular accident. Coordinate distributions of PE image values were determined for each sample of PFL in the optical arrangement of the Stokes polarimeter using the method of two-dimensional distributions of Stokes-parameters measurement.

The value of statistical points of the 1 - 4 th order was perfomed for each two-dimensional distribution of PFL images PE values. Statistical processing of the calculated values of set of points that characterize the PE distributions within representative sampling was carry out. The depending on the time change of the most sensitive points of statistical values were built to achieve values stabilization.

Results and conclusions. Two-dimensional Stokes-polarimetric mapping distributions PE of PFL images may be used in determination of the PMI. Statistical points of the 3rd and the 4th order are the most sensitive PFL optical values to evaluate postmortem changes. They characterize PFL images PE values asymmetry and kurtosis distribution.

Dynamic changes of PFL laser have demonstrated the effectiveness of this method to determine PMI.

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DETERMINATION OF POST-MORTEM INTERVAL BY LASER-INDUCED FLUORESCENCE OF POLYCRYSTALLINE CEREBRO-SPINAL FLUID FILMS IMAGES

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There are many new non-invasive optical diagnostic methods (photometric, polarization and correlation techniques) of biological tissue structure assessment, which are the most perspective in post-mortem interval determination.

The purpose of the work. Development and testing of the two-dimensional Stokes-polarimetric mapping of biological layers own fluorescence to evaluate accuracy of the post-mortem interval (PMI) assessment using statistical analysis of postmortem changes dynamics of the coordinate distributions values of polycrystalline films of liquor (PFL) images laser-induced fluorescence polarization azimuth (LIFPA).

Materials and methods. Objects of investigation are PFL, taken in 32 corpses with accurately known time of death and 8 healthy volunteers. The cause of the death was cardiovascular accident. Coordinate distributions of LIFPA image values were determined for each sample of PFL in the optical arrangement of the Stokes polarimeter in different spectral bands of optical radiation.

The value of statistical points 1 - 4 th order was perfomed for each two-dimensional distribution of PFL images LIFPA values. Statistical processing of the calculated values of set of points that characterize the LIFPA distributions within representative sampling was carry out. The depending on the time change of the most sensitive points of statistical values were built to achieve values stabilization.

Results and conclusions. Two-dimensional Stokes-polarimetric mapping distributions LIFPE of PFL images may be used in determination of the PMI. Statistical points of the 3rd and 4th order are the most sensitive PFL optical values to evaluate postmortem changes by short-range fluorescence. Statistical points of the 2rd and 4th order are the most sensitive PFL optical values in case of using media- and long- wavelength range of fluorescence They characterize PFL images PE values variance and kurtosis distribution.

Dynamic changes of PFL laser have demonstrated the effectiveness of this method to determine PMI.