World Academy of Science, Engineering and Technology
International Journal of Health and Medical Engineering
Vol:13, No:05, 2019

Possibilities of Postmortem CT to Detection of Gas Accumulations in the Vessels of Dead Newborns with Congenital Sepsis

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Abstract : It is well known that the gas formed as a result of postmortem decomposition of tissues can be detected already 24-48 hours after death. In addition, the conditions of keeping and storage of the corpse (temperature and humidity of the environment) significantly determine the rate of occurrence and development of posthumous changes. The presence of sepsis is accompanied by faster postmortem decomposition and decay of the organs and tissues of the body. The presence of gas in the vessels and cavities can be revealed fully at postmortem CT. Radiologists must certainly report on the detection of intraorganic or intravascular gas, wich was detected at postmortem CT, to forensic experts or pathologists before the autopsy. This gas can not be detected during autopsy, but it can be very important for establishing a diagnosis. To explore the possibility of postmortem CT for the evaluation of gas accumulations in the newborns' vessels, who died from congenital sepsis. Researched of 44 newborns bodies (25 male and 19 female sex, at the age from 6 hours to 27 days) after 6 - 12 hours of death. The bodies were stored in the refrigerator at a temperature of +4°C in the supine position. Grouped 12 bodies of newborns that died from congenital sepsis. The control group consisted of 32 bodies of newborns that died without signs of sepsis. Postmortem CT examination was performed at the GEMINI TF TOF16 device, before the autopsy. The localizations of gas accumulations in the vessels were determined on the CT tomograms. The sepsis diagnosis was on the basis of clinical and laboratory data and autopsy results. Gases in the vessels were detected in 33.3% of cases in the group with sepsis, and in the control group - in 34.4%. A group with sepsis most often the gas localized in the heart and liver vessels - 50% each, of observations number with the detected gas in the vessels. In the heart cavities, aorta and mesenteric vessels - 25% each. In control most often gas was detected in the liver (63.6%) and abdominal cavity (54.5%) vessels. In 45.5% the gas localized in the cavities, and in 36.4% in the vessels of the heart. In the cerebral vessels and in the aorta gas was detected in 27.3% and 9.1%, respectively. Postmortem CT has high diagnostic capabilities to detect free gas in vessels. Postmortem changes in newborns that died from sepsis do not affect intravascular gas production within 6-12 hours. Radiation methods should be used as a supplement to the autopsy, including as a kind of ‘guide’, with the indication to the forensic medical expert of certain changes identified during CT studies, for better definition of pathological processes during the autopsy. Postmortem CT can be recommend as a first stage of autopsy.

Keywords : congenital sepsis, gas, newborn, postmortem CT
Conference Title : ICFPI 2019 : International Conference on Forensic Pathology and Investigation
Conference Location : Paris, France
Conference Dates : May 16-17, 2019