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EARLY AND LATE SIGNS OF BIOLOGICAL DEATH OBSERVED IN CORPSES

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Abstract
Understanding the early and late signs of biological death is crucial for forensic investigations, medical examinations, and legal proceedings. Early signs, such as rigor mortis and livor mortis, provide insights into the time of death, while late signs, like putrefaction and skeletonization, help determine the postmortem interval (PMI). This article reviews the physiological and biochemical changes that occur after death, explores methods for detecting these changes, and discusses their importance in forensic pathology.

Keywords: Skeletonization, body, mortis, forensic, temperature, body, postmortem.

Introduction

Death marks the irreversible cessation of vital bodily functions, and identifying its signs is essential in forensic and medical sciences. The process of dying triggers a cascade of biological events, progressing from early reversible changes to late irreversible decomposition. Recognizing and categorizing these changes not only aids in establishing the cause and time of death but also helps in criminal investigations, disaster victim identification, and historical anthropology.
This paper aims to examine the biological changes that occur after death, dividing them into early and late signs, while exploring the methods used to analyze these phenomena.

Main Body:

1. Early Signs of Biological Death:

Early postmortem changes typically appear within the first 24 hours after death:
Pallor Mortis: Pale discoloration of the skin due to halted blood circulation. Appears within 15–30 minutes.
Algor Mortis: Gradual cooling of the body. The body temperature decreases at a predictable rate, aiding in time of death estimation.
Livor Mortis (Postmortem Lividity): Pooling of blood in dependent areas, causing purplish-red discoloration. Becomes fixed after 8–12 hours.
Rigor Mortis: Stiffening of muscles due to ATP depletion. Begins 2–6 hours after death, peaks at 12 hours, and fades within 24–48 hours.
Corneal Opacity: Clouding of the cornea due to dehydration, especially in open eyes.
Autolysis: Self-digestion of cells due to enzymatic activity, primarily affecting organs like the pancreas and liver.

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2. Late Signs of Biological Death:

Late postmortem changes involve extensive tissue breakdown and decomposition:

Putrefaction: Decomposition due to microbial activity, causing gas formation, discoloration, and foul odor. Begins 24–72 hours after death.

Marbling: Bacterial decomposition of blood vessels, creating a web-like discoloration pattern.

Adipocere Formation: Conversion of body fat into a waxy substance in moist environments, preserving tissues for months or years.

Skeletonization: Complete decomposition of soft tissues, leaving only bones. The timeframe depends on environmental factors (e.g., temperature, humidity, insect activity).

Mummification: Tissue desiccation and preservation in dry, arid conditions.

Research Methods:

Postmortem Interval Estimation: Body cooling curves, vitreous humor potassium levels, and biochemical markers help estimate the PMI.

Histological Analysis: Tissue samples examined under a microscope to assess cellular changes and autolytic processes.

Forensic Entomology: Studying insect colonization on corpses to estimate the time of death.

Microbial Profiling: DNA sequencing of postmortem microbiomes to understand decomposition stages.

CT/MRI Imaging: Non-invasive imaging techniques to visualize internal postmortem changes and gas distribution.

Conclusion

The study of early and late postmortem changes is essential for forensic investigations and medicolegal determinations. Early signs help narrow down the time of death, while late signs provide insights into environmental conditions and the duration of decomposition. Combining traditional forensic techniques with modern technologies enhances the accuracy of postmortem interval estimation and improves death investigations.

Further research into molecular and microbial markers of death promises to refine forensic practices and contribute to a deeper understanding of human decomposition processes.

References:

1. Ziyomiddinovich, N. M. (2024). Etiology and Pathophysiology of Glomerulonephritis Disease. Web of Semantics: Journal of Interdisciplinary Science, 2(5), 435-440.
2. Rapikov, I. (2023). Formation of savings and entrepreneurship on the basis of labor education according to age characteristics in primary school students. Procedia of Engineering and Medical Sciences, 8(12), 80-83.
3. Ziyomiddinovich, N. M. (2024). PATHOPHYSIOLOGY OF ASTHMA: EOSINOPHILIA AND NEUTROPHILIA. Miasto Przyszłości, 48, 180-185.
4. Boburjon, M., & Ziyomiddinovich, N. M. (2024). ALLERGIYANI TABIIY YO'LLAR BILAN DAVOLASH USULLARI. Journal of new century innovations, 44(1), 148-151.

Web of Medicine: Journal of Medicine, Practice and Nursing
webofjournals.com/index.php/5

5. Nasirdinov, M. (2022, October). EFFICIENCY RESULTS OF FORTIFIED FOODS IN THE DAILY DIET OF SCHOOLCHILDREN WITH IRON DEFICIENCY. In " ONLINE-CONFERENCES" PLATFORM (pp. 263-265).
6. Asliddin, S. (2024). MORPHOLOGICAL CHANGES IN LIVER PARENCHYMA IN LIVER CIRRHOSIS. In Scientific Conference on Multidisciplinary Studies (pp. 53-55).
7. Xasanboy o‘g‘li, S. S. (2024). SKIN INFECTIONS IN ATHLETES AND ITS MANAGEMENT. In Scientific Conference on Multidisciplinary Studies (pp. 56-59).
8. Boltaboev, A. (2023). COVID-19 INFECTIOUS DISEASES PRINCIPLES FOR TREATING SALICIES DURING A PANDEMIC. Евразийский журнал медицинских и естественных наук, 3(5), 262-266.
9. Болтабаев, М. У. (2023). КОРОНАВИРУС (COVID-19) ХАМРОҲ КАСАЛЛИК БИЛАН КЕЧГАНДА КАСАЛЛИКДАН КЕЙИНГИ РЕАБЛИТАЦИЯ ДАВРИДА АНИҚЛАНАДИГАН ЎЗГАРИШЛАР ВА УЛАРНИ БАРТАРАФ ЭТИШ ЧОРАЛАРИ. Scientific Impulse, 2(13), 178-182.
10. Болтабоев, А. М., & Араббоев, М. (2022). COVID-19 АССОЦИРЛАНГАН ОВҚАТ ҲАЗМ ҚИЛИШ ТИЗИМИ КАСАЛЛИКЛАРИ ЭПИДЕМИОЛОГИЯСИ ВА COVID-19 БИЛАН КАСАЛЛАНГАН БЕМОРЛАРДА КОМПЮТЕР ТОМОГРАФИЯСИ. Journal of new century innovations, 11(2), 58-69.
11. Oybek o’g’li, R. S. (2025, February). THE ROLE OF NEOROTRANSMITTERS IN PAIN AND ITS MANAGEMENT IN THE BODY. In International Conference on Modern Science and Scientific Studies (pp. 318-322).
12. Raxmonov, S. (2025). ANTI-TUOR IMMUNITY. ONCOMARKERS. Modern Science and Research, 4(3), 637-642.
13. Oybek o’g’li, R. S. (2024). THE IMPORTANCE OF LABORATORY RESULTS IN THE TREATMENT OF LIVER DISEASE. Multidisciplinary and Multidimensional Journal, 3(10), 67-74.
14. Oybek o’g’li, R. S. (2025, February). THE ROLE OF NEOROTRANSMITTERS IN PAIN AND ITS MANAGEMENT IN THE BODY. In International Conference on Modern Science and Scientific Studies (pp. 318-322).
15. Oybek o’g’li, R. S. (2025). CANCER NOMENKLATURE AND SUSTAINED PROLIFERATIVE SIGNALING. Web of Medicine: Journal of Medicine, Practice and Nursing, 3(2), 413-417.

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