H118 Postmortem Bacterial Translocation: When Does it Happen?

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After attending this presentation, attendees will better understand how and when bacterial translocation occurs in a human corpse, which is one of the first microbial changes during decomposition.

This presentation will impact the forensic science community by serving as a key factor in the understanding of postmortem changes which may improve the Postmortem Interval (PMI) evaluation.

The role of human enzymes and exogenous and endogenous bacteria during the decomposition of an adult corpse is relatively poorly documented in the forensic literature. Bacterial translocation is the migration of viable bacteria from the gastrointestinal tract to extraintestinal sites, such as the blood. This phenomenon is well described for various diseases, but not from a taphonomic perspective. This study describes the epidemiology of microorganisms and bacterial translocation during human corpse decomposition.

Methods: A blood sample was taken from the subclavian area in corpses with short (less than 72 hours) and known PMI. Blood agar and enrichment cultures were performed under aerobic and anaerobic conditions, and bacterial isolation and identification were performed using phenotypic and biochemical methods and completed by the mass spectroscopic identification of anaerobic bacteria.

Results: Analyses were performed in 18 cases with a PMI between eight and 72 hours. More than 27 different bacterial strains were isolated from eight positive samples. All of the bacteria were anaerobic or facultative anaerobic bacteria, and most were known to belong to gut microbiota. No bacteria were detected from ten samples (<0.2 CFU/mL). The shortest PMI with a polymicrobial sample was four hours without including the refrigeration time (overall PMI of 27 hours). These experiments are still in process.

Discussion: As a bacterial system, a human cadaver selects microorganisms by its growth temperature. Bacterial growth is particularly influenced by anaerobic conditions rapidly after death. Proteolytic and gas-producing bacteria from the gut were identified when the PMI was short, despite the taking of samples far from the intestines. This study provides evidence that bacteria from the gut can be present and spread during the early stages of human decomposition. Under certain circumstances and depending on the cause of death, bacterial translocation could happen at different times, even during the agonal phase, following the same mechanisms as in people suffering from illnesses. A postmortem bacterial contamination also occurs later and participates in the cadaver's microbial community. Furthermore, data gained from this research may be used while interpreting results from postmortem genomic sequencing studies.

Taphonomy, Microbiology, Bacterial Translocation