Bacterial colonization dynamics and antibiotic resistance gene spread in the hospital environment

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Video Byte

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Abstract

Our microbiomes are in continuous exchange with the microorganisms living in our indoor environments. In hospitals, this interaction may play a critical role in hospital-acquired infections and the rise of antibiotic-resistant bacteria. However, the bacterial colonization dynamics in newly opened hospitals are poorly understood. In a recent study, researchers used a longitudinal metagenomic approach to characterize this process in a newly occupied hospital ward. Sequencing data showed that the taxonomic succession was site-specific and led to stable community structures after only a few weeks. This fast colonization process was characterized by a significant increase in the bacterial biomass and its alpha-diversity. The bacterial composition of the environment could also be linked to exchanges with patient microbiota. They did not detect a rise in pathogenic bacteria during the 30-week study, but the number of antibiotic resistance genes found on the hospital floor increased over time. These results provide new insights into the development of hospital microbiomes and could be used to develop new approaches to reduce the spread of pathogens and antibiotic resistance genes in hospitals.