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Effects of Ionizing Radiation on *Escherichia Coli* (*E. Coli*) Bacteria

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Introduction: This study delves into the intricate relationship between ionizing radiation and *Escherichia coli* (*E. coli*), a bacteria vital for digestion, nutrient absorption, immune system support and protection against harmful pathogens. While many studies have examined radiation's impact on gut microbiota, few focus specifically on X-ray effects on *E. coli*. Understanding this is crucial for improving treatment planning and minimizing tissue damage in medical settings. This research was conducted to determine the effects of ionizing radiation on *E. coli* bacteria, focusing on morphological changes before and after exposure to varying technical factors such as kVp, mAs, and SID over a designated period. **Methods:** An experimental research method was employed, observing both a control group and a radiation-exposed group under increasing technical factors with immediate and five-day post-exposure assessments. Moreover, a quantitative approach was used for analysis, with data collection facilitated through systematic tabulation. The study examined four cultured strains of *E. coli*, including two assays of *E. coli* ATCC 25922 and two derived from a stool culture. **Results:** The results of the study revealed that higher intensities of radiation might lead to delayed morphological changes in the bacteria, including alterations in shape, size, surface, and margin. **Conclusions:** The study concludes that ionizing radiation does not immediately affect *E. coli* colony viability, however, gradual changes in colony morphology were observed three days after being exposed to ionizing radiation. Consequently, studying the effects of ionizing radiation on *E. coli* benefits radiologic technologists and others by advancing understanding in radiation biology and microbiology.

Keywords: *Escherichia Coli*, morphology, colony, ionizing radiation, normal flora