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Rise of Hypervirulent Antibiotic-Resistant Bacteria in Europe

Since the last assessment by the European Centre for Disease Prevention and Control (ECDC) in 2021, the spread of hypervirulent Klebsiella pneumoniae (hvKp) sequence type 23 (ST23) across European Union/European Economic Area (EU/EEA) nations has notably intensified. The tally of nations reporting such cases has more than doubled, leaping from four to ten, with the number of collected samples for examination surging from 12 to 143.

Recent findings reveal a persistent expansion of the hvKp ST23-K1 lineage, notorious for carrying carbapenemase genes, across healthcare institutions in Ireland over a five-year span, despite intensified containment measures. Preliminary indications of potential domestic spread have emerged in France, Latvia, and Lithuania through clusters of hvKp ST23-K1 isolates, though confirmation of intra-country transmission through epidemiological evidence remains pending. This pattern of dissemination, both within and among healthcare facilities, is feared to be a broader issue potentially affecting other EU/EEA states with less rigorous surveillance systems.

The concurrent emergence of K. pneumoniae strains, characterised by both heightened virulence and resistance to critical antibiotics like carbapenems, poses a significant health threat. Unlike traditional strains, hvKp can inflict severe infections in otherwise healthy individuals, with a risk of widespread bodily infection. Historically, hvKp strains, predominantly seen in Asia and acquired outside hospital settings, rarely exhibited antibiotic resistance. Nonetheless, recent observations indicate a shift towards a broader geographical spread, associations with healthcare environments, and increasing resistance to multiple drugs. The merger of virulence and antimicrobial resistance in hvKp strains raises the spectre of infections that could be untreatable in healthy adults, with the potential for significantly higher illness and death rates, especially if carbapenem-resistant hvKp strains proliferate in healthcare environments, impacting vulnerable populations. The confirmed inter-facility transmission of hvKp ST23 carrying carbapenemase genes within an EU/EEA nation underscores the high risk of further spread and entrenchment of such strains in healthcare settings, potentially exacerbating morbidity and mortality rates.

Early detection and prevention of further hvKp spread in healthcare environments across the EU/EEA are crucial to preclude the establishment of hvKp as a pathogen associated with healthcare. Response strategies should encompass alerts to healthcare professionals and microbiology labs, the development of adequate laboratory capabilities including whole-genome sequencing for hvKp identification, the referral of all suspected hvKp samples (with or without additional antimicrobial resistance) to national reference labs, and the reinforcement of infection prevention and control practices in healthcare settings. Enhanced surveillance, coupled with the prospective gathering of data on hvKp cases, including epidemiological and clinical information, infection carriage, and risk factors, will refine understanding of national dissemination patterns, transmission routes, and determine the need for augmented surveillance measures.

Source: ECDC

Image credit: NIAID

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