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Editorial

Concurrent Outbreaks of H3N2 Influenza A and Dengue Fever in Southern Iran: An Overview of Syndemic Challenges

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Health officials in Hormozgan province, southern Iran, have issued a critical warning regarding simultaneous outbreaks of H3N2 influenza A and dengue fever. They note that the rising pattern of this syndemic — a synergistic epidemic — signals an active transmission chain, a saturated spread pattern, and the inadequacy of initial containment measures, which poses severe challenges for the healthcare system (1). The preconditions for dengue fever are firmly established in southern Iran, shaped by a favorable climate, the presence of the Aedes aegypti, deficiencies in environmental improvement, and a recent outbreak in this region (2). Concurrently, like much of the Northern Hemisphere, Iran is experiencing a seasonal surge of influenza A (H3N2) (3). This convergence of a highly transmissible respiratory virus and a potentially severe arbovirus in one region constitutes more than two concurrent outbreaks. It creates a syndemic where the diseases interact within a vulnerable population and a burdened system, compounding clinical and public health burdens (4, 5). This editorial contends that an effective response demands an immediate paradigm shift from disease-specific reactions to an integrated strategy where clinical vigilance is dual and health policy is holistic.

The syndemic threat of H3N2 influenza and dengue fever manifests through these synergistic mechanisms. First, their initial clinical presentations are indistinguishable, with most patients presenting with fever, headache, and myalgia. This overlap creates a significant diagnostic dilemma for clinicians in the critical early phase of the illnesses (6). The danger is that early dengue fever may be misdiagnosed as influenza, leading to the prescription of non-steroidal anti-inflammatory drugs (NSAIDs), which can exacerbate dengue hemorrhage complications (7). Second, the syndemic leads to a huge influx of febrile individuals to healthcare facilities. These patients compete for finite health resources, such as hospital beds, nursing staff, and intravenous fluids, thereby imposing a severe operational burden on the healthcare system (8, 9). Third, there is also the possibility of an immunological synergy between diseases. Schmidt et al. demonstrated that co-infection with influenza and dengue virus can exacerbate pneumonia by impairing monocyte recruitment to the lung (10).

In regions facing concurrent H3N2 influenza and dengue fever outbreaks, the traditional diagnostic approach for influenza-like illness is potentially dangerous. Clinicians must adopt a dual suspicion, considering any febrile patient a probable case of seasonal influenza, dengue fever, or other endemic febrile illness like Coronavirus disease 2019 (COVID-19) (11, 12). While documented co-infection with dengue virus and influenza A (H3N2) remains rare, the possibility must be acknowledged in areas of simultaneous circulation (13). Certain clinical and laboratory clues can assist clinicians in distinguishing between influenza and dengue fever. Cough, sore throat, and rhinorrhea are more suggestive of influenza, whereas abdominal pain, skin rash, marked leucopenia, and thrombocytopenia point toward dengue fever (6). However, for many patients, history taking, physical examination, and laboratory investigations are insufficient. Here, rapid diagnostic tests (RDTs) become essential. Clinicians must understand their limitations;

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a negative result in the early febrile phase cannot definitively rule out infection. Therefore, a syndromic approach interpreting RDT results within the clinical context is the most reliable diagnostic strategy. For confusing cases, confirmatory molecular testing is definitive but often constrained by cost and availability (6, 11, 12, 14). To operationalize this novel diagnostic approach, national health authorities must develop and disseminate updated guidelines for febrile illness management. The ultimate goal is pragmatic: Not to achieve a definitive day-one diagnosis for all, but to ensure no patient is placed on a harmful therapeutic path due to diagnostic uncertainty.

Overcoming this syndemic demands a dual-track integrative strategy. Clinically, managing febrile illness requires a diagnostic algorithm that moves beyond supportive care alone, incorporating history taking, physical examination, and strategic use of RDTs to differentiate H3N2 influenza from dengue fever (12). To avert the most immediate danger, NSAIDs must be categorically avoided until dengue fever is confidently ruled out; analgesia should be restricted to acetaminophen (paracetamol) during the diagnostic window (7). Following a definitive diagnosis, treatment paths diverge: Prompt antiviral therapy (e.g., oseltamivir) for influenza (15) and meticulous fluid balance monitoring for dengue fever (16). Public health efforts must be equally unified and proactive. First, surveillance systems of flu-like illness and dengue fever must merge into an integrated "Febrile Syndrome Surveillance" dashboard to track disease outbreaks in real time and by geographic location (12). Second, public education campaigns must deliver a consolidated message, prompting concurrent measures: Mask wearing, social distancing, and influenza vaccination to combat respiratory spread (3), alongside protective clothing, mosquito nets, and repellent creams to prevent vector-borne transmission (2). Third, environmental health actions, specifically targeted source reduction to eliminate Aedes breeding sites, must be sustained (17). Finally, these responses require an enabling policy framework: National authorities must resource updated syndemic guidelines, pre-position critical supplies (diagnostic kits, intravenous fluids, and antiviral medication), and mandate training for healthcare workers to successfully navigate this syndemic (18, 19).

The concurrent outbreaks of H3N2 influenza and dengue fever in southern Iran represent not merely a provincial crisis but a national threat. This syndemic offers a probable preview of the evolving pattern of communicable diseases. Nevertheless, a critical opportunity lies within this challenge. By navigating this syndemic effectively, we can refine the integrated diagnostic algorithm, harmonize treatment protocols, innovate public health education, and reform policymaking, forming a resilient response framework applicable to future epidemics. The ultimate objective is to build a healthcare system robust enough not merely to withstand, but to proactively manage the inevitable convergence of the diseases. Achieving this demands nothing less than a united front, where clinicians, epidemiologists, and policymakers transcend traditional silos in a shared mission for national health security.

Footnotes

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