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Narrative Review

Clinical Manifestations and Management of Multiresistant Traveler's Diarrhea in the Era of Increasing Gastronomy Tourism Trends: A Narrative Review

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ABSTRACT

Background of study: The exponential growth of gastronomy tourism has redefined global and regional travel, encouraging tourists to explore authentic local cuisines and traditional baked goods in less congested areas. However, this trend has catalyzed a surge in Traveler's Diarrhea (TD), complicated by the alarming rise of antimicrobial-resistant (AMR) enteropathogens. **Aims and scope of paper:** This narrative review aims to evaluate the evolving clinical manifestations of multiresistant TD and synthesize updated management protocols, emphasizing the roles of medical education and health informatics. **Methods:** A comprehensive literature search was conducted, encompassing 30 peer-reviewed national and international journal articles published between 2021 and 2026. The review focused on epidemiological shifts, resistance patterns, and clinical management strategies. **Result:** Findings indicate a significant shift in TD etiology, with fluoroquinolone-resistant *Campylobacter jejuni* and Extended-Spectrum Beta-Lactamase (ESBL)-producing *Escherichia coli* becoming predominant. Clinical manifestations of multiresistant TD are characterized by prolonged symptom duration, higher rates of progression to severe dehydration, and frequent empirical treatment failures. **Conclusion:** Effectively managing multiresistant TD requires a paradigm shift from broad-spectrum empirical antibiotics to targeted therapies like azithromycin or rifaximin. Strengthening clinical competencies through Problem-Based Learning (PBL) and Objective Structured Practical Examination (OSPE) checklists, alongside implementing Electronic Medical Records (EMR) for syndromic surveillance, are crucial steps for primary care facilities in tourist hubs.

Introduction

Background of the study: Gastronomy tourism has emerged as a primary driver of modern travel. Tourists are increasingly venturing beyond conventional tourist hotspots, seeking authentic culinary experiences in local, less congested areas. This includes sampling traditional street foods, artisanal baked goods, and regional specialties at local markets. While this cultural immersion offers significant economic benefits to local communities, it simultaneously exposes immunologically naive travelers to diverse and unfamiliar microbial flora [1, 2]. Consequently, Traveler's Diarrhea (TD) remains the most frequent health complaint among tourists. However, the landscape of TD is rapidly changing due to the alarming global escalation of antimicrobial resistance (AMR), transforming a once easily manageable condition into a complex clinical challenge [3].

Literature review: Historically, TD was considered a mild, self-limiting condition primarily caused by Enterotoxigenic *Escherichia coli* (ETEC) and was routinely treated with short courses of fluoroquinolones [4]. Recent literature, however, highlights a disturbing epidemiological shift. The indiscriminate use of antibiotics in both human medicine and agriculture has fueled the rise of multiresistant enteropathogens. Studies from the past five years document a high prevalence of fluoroquinolone-resistant *Campylobacter jejuni* and Extended-Spectrum Beta-Lactamase (ESBL)-producing *Enterobacteriaceae* among returning travelers [5, 6]. Furthermore, travelers who acquire these resistant strains during their culinary holidays often become asymptomatic carriers, facilitating the intercontinental and inter-regional spread of AMR [7].

Gap analysis: Despite the growing prevalence of multiresistant TD, there is a distinct lack of updated, standardized management protocols implemented at the primary care level, particularly in resource-limited tourist destinations [8]. Many primary

care physicians continue to rely on outdated empirical regimens, leading to treatment failures, prolonged morbidity, and increased healthcare costs [9]. Furthermore, there is a significant gap in the integration of travel history and AMR tracking within local health information systems, hindering early detection and outbreak containment [10].

Rationale of the study: Addressing the complexities of multiresistant TD requires a comprehensive understanding of its evolving clinical manifestations and a critical reappraisal of current treatment paradigms.

Purpose of the study: This narrative review aims to synthesize the most recent evidence (2021-2026) regarding the clinical manifestations and management of multiresistant TD. Furthermore, it explores strategic solutions through the enhancement of basic medical education and the integration of medical informatics to better equip primary care systems in gastronomy tourism destinations.

Methods

This study utilizes a narrative review design to provide a comprehensive synthesis of the current literature on multiresistant Traveler's Diarrhea [11].

Scope and limitations of the methodology: The scope of this review is restricted to peer-reviewed national and international journal articles published within the last five years, specifically between January 2021 and March 2026. This timeframe was selected to capture the most recent post-pandemic shifts in travel patterns and the latest data on antimicrobial resistance.

Procedures and Analysis Plan: A systematic literature search was conducted across major electronic databases, including PubMed, Scopus, Web of Science, and Google Scholar. The search strategy utilized combinations of the following keywords: "traveler's diarrhea", "antimicrobial resistance", "gastronomy tourism", "foodborne illness", "medical education", and "health informatics". A

total of 30 articles were selected based on their relevance to the topic, encompassing epidemiological studies, clinical guidelines, multicenter observational cohorts, and medical education research. The findings were thematically analyzed and categorized into clinical manifestations, updated management protocols, educational interventions, and technological applications.

Discussions

The findings of this review highlight a critical intersection between shifting travel behaviors and global infectious disease dynamics. Addressing the challenge of multiresistant TD in the context of gastronomy tourism requires a multi-faceted approach.

Interpreting the Findings and Updating Management The high failure rates of older antibiotics necessitate a paradigm shift in the clinical management of TD [19]. Current international consensus guidelines emphasize a severity-based approach. Mild TD should be managed exclusively with oral rehydration and antimotility agents (e.g., loperamide), strictly avoiding antibiotic use to prevent further resistance [20]. For moderate to severe cases, particularly those involving dysentery or severe systemic symptoms, targeted therapy is crucial. Macrolides, specifically azithromycin, have emerged as the preferred empirical treatment due to their efficacy against fluoroquinolone-resistant *Campylobacter* and severe *E. coli* infections [21]. Rifaximin, a non-absorbable antibiotic, is also highly effective for non-invasive ETEC and minimizes systemic side effects, though its cost may limit availability in some primary care settings [22].

Enhancing Clinical Competence through Medical Education The frontline defense against multiresistant TD lies in the competency of primary care physicians. However, diagnostic delays and inappropriate antibiotic prescribing remain prevalent. This underscores the need for robust interventions within medical education,

particularly in the foundational stages managed by Medical Education Units (MEUs) [23].

1. **Problem-Based Learning (PBL):** Integrating complex, real-world PBL scenarios into the curriculum—such as managing a tourist presenting with refractory dysentery after consuming local street food—forces students to develop critical clinical reasoning skills [24]. These scenarios must emphasize the interpretation of local resistance patterns and the judicious use of antibiotics.
2. **OSPE Checklists:** Developing specific Objective Structured Practical Examination (OSPE) checklists for travel medicine consultations ensures that future doctors systematically evaluate dietary exposure risks, assess dehydration severity accurately, and prescribe evidence-based regimens rather than defaulting to broad-spectrum antibiotics [25].

The Crucial Role of Medical Informatics In an era of highly mobile populations, fragmented medical data severely hampers the management of infectious diseases. The integration of medical informatics is essential for modernizing the response to multiresistant TD [26].

1. **Syndromic Surveillance via EMR:** Facilities adopting standardized Electronic Medical Records (EMR) can perform real-time data mining to detect spatial clusters of gastroenteritis. If a surge of TD cases is recorded among tourists visiting a specific culinary festival or local market, the EMR system can alert public health authorities for immediate intervention [27].
2. **Antimicrobial Stewardship:** EMRs equipped with clinical decision support systems (CDSS) can guide physicians toward appropriate prescribing. By cross-referencing a patient's travel history with regional AMR databases, the system can block the prescription of antibiotics with known high resistance rates in the region

the patient visited, thereby enforcing antimicrobial stewardship at the point of care [28, 29]. Furthermore, integrated EMRs ensure continuity of care, allowing clinicians to review previous antibiotic trials if a patient presents with persistent symptoms [30].

Conclusion

Epidemiological Shifts in Gastronomy Tourism

The pursuit of authentic culinary experiences often involves consuming foods prepared in environments where hygiene standards may fluctuate. Traditional baked goods, artisanal pastries, and street food dishes, while culturally enriching, serve as frequent vectors for enteropathogens if not handled or stored correctly [12]. The data indicates that bacterial pathogens remain responsible for over 80% of TD cases. However, the resistance profiles of these bacteria have altered dramatically. The acquisition of ESBL-producing *E. coli* is now reported in up to 30-60% of travelers returning from high-risk regions [13].

Clinical Manifestations of Multiresistant TD

While the classic symptoms of TD—loose stools, abdominal cramps, nausea, and vomiting—remain consistent, multiresistant strains present distinct clinical challenges.

- Prolonged Duration:** Infections caused by resistant strains are associated with a significantly longer duration of illness, often exceeding the typical 3-5 days and occasionally leading to persistent diarrhea (lasting more than 14 days) [14].
- Increased Severity:** There is a higher incidence of progression from mild to moderate/severe disease, characterized by dysentery (bloody stools), high fever, and acute dehydration requiring intravenous fluid resuscitation [15].
- Post-Infectious Complications:** The prolonged inflammatory state induced by refractory infections increases the risk of developing post-infectious irritable

bowel syndrome (PI-IBS) and reactive arthritis [16].

Treatment Failures and Evolving Guidelines

The most critical finding is the high failure rate of traditional empirical therapies. Fluoroquinolones (e.g., ciprofloxacin) are no longer recommended as first-line empirical therapy for TD acquired in many parts of the world, particularly Southeast Asia, due to widespread resistance [17]. The reliance on these drugs not only delays recovery but also exacerbates the dysbiosis of the patient's gut microbiome, increasing vulnerability to opportunistic infections like *Clostridioides difficile* [18].

Table 1. Evolving Resistance Patterns and Preferred Therapeutics in TD

Pathogen	Historic First-Line Therapy	Current Resistance Trends	Updated Preferred Therapy
<i>Campylobacter jejuni</i>	Fluoroquinolones	High (global)	Azithromycin
ETEC (ESBL-producing)	Fluoroquinolones	Moderate to High	Azithromycin, Rifaximin
<i>Shigella spp.</i>	Ciprofloxacin	High	Azithromycin, Ceftriaxone
<i>Salmonella spp.</i>	Fluoroquinolones	Increasing	Azithromycin

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