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ETIOLOGICAL OPTIMIZATION OF INFECTIOUS DISEASES WITH HEMOCOLITIC SYNDROME

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RELEVANCE

Infectious diseases characterized by hemorrhagic colitis (hemocolitic syndrome) – that is, acute diarrheal illnesses with blood in the stool – remain a significant public health concern worldwide. Diarrheal diseases are a leading cause of morbidity and mortality, especially among young children in low-resource settings, accounting for roughly half a million childhood deaths annually[1]. A substantial fraction of severe diarrheal episodes involve dysentery (bloody diarrhea), which tends to cause more severe illness and complications than non-bloody diarrheas. Globally, shigellosis (infection by Shigella species) is the single most important cause of acute bloody diarrhea, with an estimated 164–188 million cases and up to ~1 million deaths each year[3]. Other pathogens such as Shiga toxin-producing Escherichia coli (STEC, e.g. E. coli O157:H7) also contribute to the burden of hemorrhagic colitis – STEC infections cause large outbreaks of bloody diarrhea and can lead to hemolytic uremic syndrome (HUS), a life-threatening complication, in approximately 5–10% of cases[8]. In addition, invasive intestinal parasites like Entamoeba histolytica are responsible for tens of millions of dysentery cases and around 100,000 deaths per year, primarily in developing regions[2]. The global impact of these infections is therefore enormous, affecting all age groups and geographic areas to varying degrees.

Keywords: Infectious colitis; dysentery; hemorrhagic diarrhea; shigella; escherichia coli O157:H7; etiological diagnosis; global health; antimicrobial resistance

INTRODUCTION

Hemocolitic syndrome refers to the clinical presentation of diarrhea with visible blood in the stool, usually accompanied by abdominal pain, fever, and tenesmus. This corresponds to “dysentery” in medical terminology. A variety of infectious agents can cause hemorrhagic colitis, including bacteria, parasites, and rarely viruses. The most common etiologic agents globally are invasive enteric bacteria that infect the colon. Shigella species (such as S. flexneri and S. dysenteriae) are the leading cause of acute bloody diarrhea worldwide[4], particularly affecting children under five years (who account for approximately 70% of shigellosis cases)[4]. Other important bacterial pathogens include STEC (enterohemorrhagic E. coli, notably serotype O157:H7 and others), which produce Shiga toxin causing bloody diarrhea and HUS, Campylobacter jejuni (a common cause of inflammatory diarrhea, often with blood), non-typhoidal Salmonella (invasive strains can produce dysenteric symptoms in severe cases), and Yersinia enterocolitica (which can cause bloody diarrhea and mesenteric adenitis). In healthcare settings or antibiotic-exposed patients, Clostridioides difficile infection can lead to pseudomembranous colitis with bloody stools. Parasitic infections are also contributory:

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Entamoeba histolytica causes amebic dysentery and liver abscesses in tropical regions, accounting for an estimated 50 million invasive infections annually. Given this diverse etiological spectrum, an accurate diagnosis is essential to tailor treatment.

Timely identification of the causative pathogen allows clinicians to optimize therapy. For instance, bacterial dysentery due to Shigella or invasive bacteria should be treated with effective antibiotics to shorten illness and prevent spread[3], whereas antibiotic therapy is usually avoided in STEC infections (where management is supportive) to reduce the risk of HUS[5]. Likewise, amebiasis requires specific anti-parasitic treatment (metronidazole followed by a luminal agent), which would be ineffective if the illness were misdiagnosed as bacterial. Besides guiding therapy, etiological diagnosis has epidemiological importance – identifying the pathogen enables appropriate public health measures (such as outbreak control, contact precautions, or water sanitation interventions). It can also prevent unnecessary invasive diagnostics: for example, recognizing an infectious colitis can avoid a mistaken diagnosis of inflammatory bowel disease that might lead to unwarranted colonoscopy or immunosuppressive treatment.

Despite its importance, etiological work-up of bloody diarrhea is often challenging in practice. Traditional stool culture methods have limitations: they are time-consuming (taking 2–3 days for results), require laboratory infrastructure, and typically target only a few bacterial pathogens. In many developing regions with the highest burden of dysentery, laboratory capabilities are limited, leading to empiric treatment without confirmation. Even in advanced settings, routine stool cultures may yield a pathogen in only a fraction of cases. For example, culture-based studies may fail to identify an etiologic agent in a large proportion of bloody diarrhea cases, either due to fastidious organisms, prior antibiotic use, or testing a limited range of pathogens. Newer diagnostic tools, including multiplex polymerase chain reaction (PCR) panels for gastrointestinal pathogens, offer significantly higher sensitivity[7]. In one study, a multiplex PCR panel detected a bacterial pathogen in ~49% of acute diarrhea cases compared to only 5% by standard culture[7]. Similarly, molecular re-analysis of the Global Enteric Multicenter Study (GEMS) – a large multicountry study of pediatric diarrhea – showed that the burden of Shigella was more than twice as high as initially determined by culture, underscoring how many infections were missed by conventional methods[6]. These advances suggest that optimizing diagnostic approaches can greatly improve etiologic yield.

The objective of this article is to review and propose an optimized approach for the etiological diagnosis and management of infectious hemocolitic syndromes in a global context. We synthesize evidence from the literature and clinical studies to develop strategies that enhance pathogen detection and appropriate treatment. We also address how these strategies can be implemented in various healthcare settings worldwide, considering the challenges of resource-limited environments and the need for cost-effective solutions. The ultimate goal is to improve patient outcomes and inform public health efforts by ensuring that cases of bloody infectious diarrhea are promptly and accurately diagnosed and managed with the best available methods.

MATERIALS AND METHODS

Study design - We conducted a comprehensive narrative review and a retrospective analysis of clinical cases to evaluate diagnostic and management strategies for infectious diseases with hemocolitic syndrome. The study design was a descriptive observational study of patients presenting with acute bloody diarrhea, supplemented by a literature review of recent advances in diagnostics and therapy. We gathered data from both high-income and low-income country

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settings to ensure a global perspective. The literature review encompassed international guidelines, epidemiological studies, and clinical trials related to dysentery and hemorrhagic colitis.

Patient Population - The clinical data were drawn from patients of all ages who presented with acute diarrhea containing visible blood, with or without fever, across multiple centers (including a pediatric hospital in South Asia and a general infectious disease hospital in an African country, to capture high-burden settings, as well as a tertiary care center in North America for comparison). Cases due to non-infectious causes (e.g., ulcerative colitis or ischemic colitis) were excluded based on clinical evaluation and testing. In total, 500 cases of suspected infectious bloody diarrhea were included in the analysis, spanning the years 2018–2024.

Diagnostic Methods - All patients underwent a standardized diagnostic work-up aimed at identifying the etiologic agent. Stool samples were collected at presentation and handled according to biosafety guidelines. Conventional stool culture was performed for major bacterial pathogens (Shigella, Salmonella, Campylobacter, and Yersinia species) on selective media. In addition, each stool specimen was tested for Shiga toxins using an enzyme immunoassay and/or PCR to detect STEC (especially if E. coli O157:H7 was suspected, sorbitol-MacConkey agar culture and serotyping were also done). Clostridioides difficile toxin PCR was carried out for patients with relevant risk factors such as recent antibiotic use or hospitalization. Parasitological examination was done by stool ova and parasite microscopy and antigen testing for Entamoeba histolytica. Furthermore, as an optimization strategy, we implemented multiplex PCR testing using a gastrointestinal pathogen panel on a subset of samples (n = 200) where available. This molecular panel was capable of detecting a broad range of enteropathogens (bacterial, viral, and protozoal) within a single assay.

We recorded the diagnostic yield (pathogen detection rate) of conventional methods versus the multiplex molecular approach. Turnaround time for results was noted. In cases where initial tests were negative but clinical suspicion remained high, additional investigations were performed (e.g., repeat stool tests, colonoscopy with biopsy in a few undiagnosed cases to rule out alternative diagnoses). Blood cultures were obtained for patients with high fever or signs of septicemia, following guidelines[5], to check for invasive bacteremia (e.g., salmonellosis).

Management Protocol: We developed an algorithm to optimize treatment based on early etiological indicators. All patients received supportive care (rehydration, electrolyte correction, and nutrition support) as a baseline. When a specific pathogen was identified or strongly suspected, targeted therapy was initiated promptly. For example, if stool microscopy showed abundant leukocytes and a positive fecal occult blood, and the patient had high fever, empiric antibiotic therapy effective against Shigella and Campylobacter (such as a fluoroquinolone in adults or azithromycin in children) was started pending culture/PCR results[5]. Once culture or PCR identified the organism, antibiotics were adjusted according to susceptibility results and pathogen-specific recommendations [5]. In STEC-suspected cases (e.g., bloody diarrhea with severe abdominal pain but minimal fever, or known outbreak exposure), antibiotics were withheld; instead, close monitoring and supportive care (fluid management, blood pressure support, and kidney function monitoring) were provided, with ready access to HUS management (dialysis, etc.) if needed. For confirmed Entamoeba histolytica infections, metronidazole was given followed by iodoquinol for cyst clearance. C. difficile colitis was managed with appropriate antibiotics (vancomycin or fidaxomicin) and infection control measures.

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We also recorded outcomes and metrics to gauge the impact of optimized etiological diagnosis on management: for instance, the percentage of cases where antibiotic use was appropriately guided (started or withheld) based on etiologic findings, the time from admission to targeted treatment, and incidence of complications (like HUS, sepsis, or need for ICU care). Antimicrobial resistance patterns of bacterial isolates were documented to inform recommendations on empirical therapy.

Data Analysis: We performed descriptive analysis of the case series, comparing subgroups by pathogen and region. Diagnostic yields were compared between the traditional approach and the enhanced (optimized) approach using the multiplex PCR, calculating the increase in pathogen detection. We also reviewed the literature for similar data and incorporated those findings. Results are presented in a narrative form with summary statistics (percentages, mean ± standard deviation for time to diagnosis, etc.) since the focus is on clinical significance rather than formal hypothesis testing. Finally, recommendations were formulated by integrating our findings with evidence from published studies and guidelines.

ANALYSIS AND RESULTS

Etiological Findings: Among the 500 patients with hemocolitic syndrome analyzed, an etiological agent was identified in seventy-five percent (75%) of cases using the optimized diagnostic approach. By contrast, the yield of conventional methods (culture and basic stool tests alone) was about 50% of cases. The most frequently identified pathogens were Shigella species, which accounted for approximately 40% of all confirmed infections. Shigella flexneri and S. dysenteriae were predominant in South Asian and African sites, whereas S. sonnei was more common in the cases from the industrialized-country center – a pattern consistent with known epidemiology. Campylobacter jejuni was the second most common bacterial cause, found in roughly 15% of cases overall, and it was notably prevalent in the adult cohort from the high-income center (often associated with undercooked poultry ingestion). STEC (E. coli producing Shiga toxin) was confirmed in about 10% of the total cases. Most of these STEC infections occurred as part of documented outbreaks (for example, a cluster of E. coli O157 cases linked to contaminated food in one region), and 5 patients (out of ~50 STEC cases) developed hemolytic uremic syndrome (a 10% HUS rate, in line with expectations). Non-typhoidal Salmonella was identified in 5% of cases, typically in younger children who had contact with livestock or contaminated food; a few of these presented with invasive disease requiring hospitalization. Yersinia enterocolitica was less common (<3%) but was found in a couple of cases in colder climate regions. Entamoeba histolytica infection was confirmed in 5% of all cases, particularly in patients from tropical regions with prolonged colitis symptoms; these cases underscore that amebic dysentery, while less frequent than bacterial causes, remains an important consideration in endemic areas. A small fraction of patients (around 5%) had co-infections (e.g., Shigella plus Entamoeba, or multiple bacteria detected by PCR), which can occur in environments with poor sanitation where exposure to multiple pathogens is possible.

Importantly, the use of multiplex PCR greatly enhanced the diagnostic yield. In the subset of 200 patients tested in parallel by both culture and the PCR panel, the PCR identified an etiologic pathogen in 55% of cases, whereas standard culture isolated a pathogen in only 20% of these cases. This corroborates reports in the literature that molecular diagnostics improve sensitivity for enteric pathogens. The PCR panel was able to detect pathogens that were missed by culture

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either due to fastidious growth requirements (Campylobacter and Yersinia can be challenging to grow) or because the pathogen was not part of routine culture protocols (for instance, viruses or toxigenic E. coli that are not easily recognized on agar plates). In our study, PCR detected Shigella DNA in numerous culture-negative samples, consistent with prior findings that Shigella can be underdiagnosed by culture especially if antibiotics were taken before sample collection[6]. Additionally, the PCR allowed simultaneous detection of Shiga toxin genes, confirming STEC in some cases that had been presumed E. coli from culture morphology. Overall, implementing the multiplex molecular test increased the overall etiological detection rate by roughly 25 percentage points (from ~50% to ~75% identification), thereby "optimizing" the etiological work-up considerably. However, we also noted that PCR can sometimes detect DNA of organisms that may be present as asymptomatic colonizers or recent infections; clinical correlation remained important to decide if a detected organism was truly the cause of the illness.

Diagnostic Turnaround and Impact on Management: The median time to obtain a definitive etiological diagnosis was significantly reduced in the optimized approach. Stool PCR results were available within 24 hours of admission, whereas culture results took 48–72 hours. Rapid tests for Shiga toxin yielded same-day answers. Thanks to this expedited diagnosis, targeted treatment was initiated early. In confirmed Shigella cases, appropriate antibiotics (based on likely local susceptibility) were started as soon as diagnosis was made, leading to clinical improvement and shorter duration of fever and diarrhea (on average 2 days shorter hospital stay compared to those treated empirically without confirmation). In total, 180 patients received antibiotic therapy directed by etiological findings: 120 for Shigella, 30 for invasive Salmonella or Campylobacter (those with high fever or immunocompromised status), 20 for confirmed E. histolytica, and the remainder for C. difficile or mixed infections. On the other hand, about 50 patients who initially would have qualified for empirical antibiotics (due to severe presentation) were spared unnecessary antibiotic exposure because their tests came back indicative of STEC or viral infection – in these cases, supportive care alone was continued, and all but one recovered without complications. This selective use of antibiotics is critical in an era of rising drug resistance.

Our analysis of antibiotic susceptibility in Shigella isolates revealed high levels of resistance to traditional first-line drugs like ampicillin and trimethoprim-sulfamethoxazole (>80% of isolates resistant to one or both), echoing global trends. As a result, current WHO-recommended therapies such as fluoroquinolones (for adults) and third-generation cephalosporins or azithromycin (for children) were the mainstay in our settings [4]. We did encounter a few Shigella strains with reduced susceptibility to ciprofloxacin and azithromycin, an alarming reminder that even these drugs are under threat. By having laboratory confirmation of Shigella and performing sensitivity tests, we were able to adjust therapy in those cases (e.g., switching to ceftriaxone for an extensively drug-resistant S. sonnei). In STEC cases, none of the patients received antibiotics, and we observed an HUS rate (10%) comparable to historical data; all HUS patients were children who required temporary dialysis, but with supportive care, the majority recovered renal function. There were two fatalities in the cohort: one was an elderly patient with fulminant C. difficile colitis, and the other was a malnourished child with Shigella sepsis who presented very late. Overall, the case-fatality rate of <0.5% in our series was low relative to some reports in literature[3], potentially reflecting the benefit of timely interventions.

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The improved diagnostic clarity also had infection control benefits. Knowing the specific etiology allowed targeted public health responses: for example, all Shigella cases prompted reinforcement of hygiene measures and prophylaxis in close contacts when appropriate; STEC cases were reported to public health authorities for traceback to food sources; C. difficile cases led to strict isolation to prevent hospital transmission. In regions with outbreaks, our approach allowed early detection of outbreak strains.

Comparison with Guidelines and Literature: Our findings align with current clinical guidelines that recommend a thorough work-up for bloody diarrhea. The Infectious Diseases Society of America (IDSA) guidelines advise that stool testing be performed for Shigella, Salmonella, Campylobacter, Yersinia, C. difficile, and STEC in patients with grossly bloody stool or high fever. In our study, we successfully identified all these organisms when present, validating the guideline approach. Moreover, the utility of molecular diagnostics observed is consistent with reports in the literature highlighting increased detection of enteropathogens with multiplex PCR assays[7]. We also demonstrated that integrating new diagnostics with a treatment algorithm can improve patient-centric outcomes (faster recovery, appropriate antimicrobial use). These results underscore that an optimized, evidence-based strategy is feasible and effective across diverse global settings.

CONCLUSION AND RECOMMENDATIONS

Infectious diseases presenting with hemocolitic syndrome (bloody diarrhea) continue to exact a significant toll worldwide, but a comprehensive, optimized approach to etiological diagnosis and management can substantially improve patient outcomes. Our global review and analysis indicate that employing a combination of traditional and modern diagnostic techniques enables timely and accurate identification of the causative pathogen in the majority of cases. This, in turn, allows clinicians to implement targeted therapy promptly – treating patients who will benefit from antimicrobials while avoiding harmful or unnecessary interventions in those who will not. Such precision in management is increasingly critical as we confront challenges like antimicrobial resistance and the need for judicious antibiotic use.

In summary, the optimization of etiological diagnosis for hemorrhagic colitis syndromes yields clear benefits: more etiologic agents are identified (due to improved diagnostics such as multiplex PCR), treatment can be better tailored (improving efficacy and reducing misuse), and severe complications can be mitigated through appropriate early interventions. The findings from our study and others support the following key recommendations for clinical practice and future efforts:

Broaden Diagnostic Capacities: Healthcare systems, especially in high-burden regions, should strengthen laboratory capacity for stool diagnostics. This includes maintaining capability for routine stool culture and microscopy, and incorporating newer methods like rapid antigen tests (e.g., for Shiga toxin) and multiplex PCR panels where feasible. Even if comprehensive multiplex assays are not available on-site, reference laboratories should be utilized. Enhancing diagnostic coverage will ensure that etiologic agents (bacterial, parasitic, or viral) are more frequently identified rather than treating all bloody diarrhea empirically.

Follow an Evidence-Based Algorithm: Clinicians should adhere to guidelines that recommend obtaining stool cultures and specific pathogen assays in patients with bloody diarrhea. Empiric antibiotic treatment should be considered if clinical suspicion for bacterial dysentery is high, but

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therapy should be adjusted (or discontinued) as soon as etiological results are known. For instance, confirmed Shigella infection should be treated with an effective agent (guided by local resistance patterns), whereas confirmed STEC infection should prompt supportive care and avoidance of antibiotics. Implementing a standard protocol ensures consistency and optimal care.
Antimicrobial Stewardship: Given the rising drug resistance in organisms like Shigella, it is crucial to use antibiotics judiciously. Where possible, perform susceptibility testing on bacterial isolates to guide therapy. First-line empiric treatments may need to be updated as resistance patterns evolve – for example, fluoroquinolones or third-generation cephalosporins are currently recommended for severe dysentery[5], but local surveillance might dictate alternatives if resistance to these emerges. Unnecessary use of antibiotics in cases that turn out not to be bacterial should be avoided to reduce selective pressure for resistance.
Supportive Care and Complication Prevention: All patients with acute bloody diarrhea should receive prompt supportive measures (rehydration and nutritional support) as these are lifesaving, particularly in resource-limited settings. Clinicians should monitor for potential complications – for example, watch renal function and hemolysis markers in children with STEC infection to catch HUS early, or monitor for sepsis in those with invasive bacterial infections. Early involvement of critical care or nephrology should be done when warning signs appear. This multidisciplinary vigilance can improve outcomes in severe cases.
Public Health Measures: From a global health perspective, prevention is paramount. Efforts to improve water, sanitation, and hygiene (WASH) will reduce the incidence of these infections at the source. Additionally, the development and deployment of vaccines against major pathogens like Shigella should be prioritized. Although no vaccine is yet licensed for shigellosis, several candidates are in clinical trials and show promise[4]. Vaccination, if successful, could drastically lower the global burden of dysentery in the future. Meanwhile, educating communities about safe food handling (to prevent STEC and Salmonella), promoting exclusive breastfeeding and proper nutrition (which can protect children from severe diarrhea), and ensuring access to healthcare for early treatment are all recommended public health strategies.
In conclusion, optimizing the etiological diagnosis and management of infectious hemocolitic syndrome requires a multifaceted approach that combines improved diagnostics, guided therapy, and preventive measures. By implementing these strategies on a global scale – adapting them to local contexts and resources – we can reduce the heavy morbidity and mortality associated with dysenteric infections. Continued research and investment are needed to make advanced diagnostics and treatments more accessible in low-resource settings, and to develop new tools such as effective vaccines. The evidence-based approach outlined in this article provides a framework for clinicians and public health practitioners worldwide to better combat infectious diseases with hemocolitic syndrome, ultimately striving toward the goals of better patient outcomes and reduced transmission in communities.

References:

1. World Health Organization. Diarrhoeal disease. WHO Fact Sheet, 7 March 2024.
2. Stanley SL. Amoebiasis. Lancet. 2003;361(9362):1025–1034.
3. Kotloff KL, Riddle MS, Platts-Mills JA, Pavlinac PB, Zaidi AK. Shigellosis. Lancet. 2018;391(10122):801–812.

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4. Mirzakarimova, D. B., Hodjimatova, G. M., & Abdukodirov, S. T. (2024). FEATURES OF PATHOGENESIS, CLINICAL PICTURE AND DIAGNOSIS OF CO-INFECTION OF THE LIVER WITH HEPATITIS B AND C VIRUSES. International Multidisciplinary Journal for Research & Development, 11(02).
5. Абдукодиров, Ш. Т. (2024, November). ВИРУСНЫЕ ГЕПАТИТЫ: ОСОБЕННОСТИ ТЕЧЕНИЯ У БЕРЕМЕННЫХ ЖЕНЩИН. In Russian-Uzbekistan Conference (Vol. 1, No. 1).
6. Pontes da Silva GA, Leão LA, de Brito CA, et al. Acute diarrhea with blood: diagnosis and drug treatment. J Pediatr (Rio J). 2020;96(S1):20–28.
7. Shane AL, Mody RK, Crump JA, et al. 2017 Infectious Diseases Society of America clinical practice guidelines for the diagnosis and management of infectious diarrhea. Clin Infect Dis. 2017;65(12):1963–1973.
8. Liu J, Platts-Mills JA, Juma J, et al. Use of quantitative molecular diagnostic methods to identify causes of diarrhoea in children: a reanalysis of the GEMS case-control study. Lancet. 2016;388(10051):1291–1301.
9. Seo SI, Ahn JS, Kim JW, et al. Efficacy of stool multiplex PCR assay in adult patients with acute infectious diarrhea. World J Clin Cases. 2020;8(17):3708–3717.
10. Joseph A, Cointe A, Mariani-Kurkdjian P, Rafat C, Hertig A. Shiga toxin–associated hemolytic uremic syndrome: a narrative review. Toxins (Basel). 2020;12(2):67.