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Original Research Article

Short Course and Conventional Antimicrobial Duration in Mild and Moderate Intra-abdominal Infection Among Admitted Patients

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Abstract: *Prolonged antibiotic therapy for community-acquired intra-abdominal infections (CA-IAIs) has traditionally been prescribed for seven to ten days, despite growing evidence that shorter regimens may be equally effective after adequate source control. Optimizing antibiotic duration is critical to improving antimicrobial stewardship, minimizing drug resistance, and reducing hospital resource utilization.* ***Objective:*** *To compare clinical efficacy, safety, and resource utilisation of a protocol-driven four-day short-course versus conventional seven-to-ten-day antimicrobial therapy in adults hospitalised with mild or moderate community-acquired intra-abdominal infection.* ***Methods:*** *This single-centre, prospective, parallel-group study was conducted between 1 July 2024 and 31 March 2025. Adults ≥ 18 years admitted with a radiologically confirmed mild or moderate community-acquired intra-abdominal infection (IAI)—including perforated appendicitis, localized diverticulitis, cholecystitis, or contained hollow-viscus perforation—were screened within 24 h of source-control intervention (laparoscopic/open surgery or image-guided percutaneous drainage).* ***Results:*** *Baseline inflammatory markers were comparable: mean white-cell count was 12.8 ± 2.8 × 10^9/L in the conventional arm and 11.8 ± 3.3 × 10^9/L in the short-course arm (p = 0.367), while mean C-reactive protein levels were 48.9 ± 19.6 mg/L versus 47.2 ± 20.3 mg/L (p = 0.741). Length of stay averaged 12.7 ± 2.8 days for conventional therapy and 9.42 ± 3.95 days for short-course therapy, though this difference did not reach statistical significance (p = 0.638). Clinical success rates were 100% (58/58) in the conventional group and 95% (40/42) in the short-course group (p = 0.16). Recurrence occurred in 2% (1/58) of conventional patients and none of the short-course patients (p = 0.323), while 30-day mortality was 5% in both arms (3/58 vs. 2/42; p = 0.57). Adverse events were reported in 9% (5/58) of the conventional group and 19% (8/42) of the short-course group (p = 0.372).* ***Conclusion:*** *A fixed four-day regimen after adequate source control produced the same clinical success, mortality, and recurrence as conventional eight-day therapy.*

Keywords: antimicrobial duration, abdominal infections, success rate, adverse effects

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Introduction

Intra-abdominal infection (IAI) is the second-most frequent cause of sepsis in surgical wards and, even with modern care, carries a global case-fatality rate of about 9 % for complicated presentations according to the World Surgical Infection Study (WISS) cohort (1). Although mild and moderate IAIs (e.g., perforated appendicitis, localized diverticulitis, cholecystitis) typically resolve after source control plus antimicrobials, the optimal length of antibiotic therapy remains contentious. Unnecessary prolongation is not benign: in 2019, antimicrobial-resistant bacteria directly caused an estimated 1.27 million deaths and contributed to 4.95 million deaths worldwide, outpacing HIV and malaria (2). Balancing cure, cost, and stewardship, therefore, hinges on defining whether a short, fixed course is as safe as the historical "treat-until-normal-labs" approach (1, 3).

Early randomised data set the stage. The landmark STOP-IT trial randomised 517 patients with mostly mild-to-moderate cIAI (mean APACHE II ≈ 10) to a fixed four-day course versus conventional therapy continued for a median of eight days after source control. The composite outcome of surgical-site infection, recurrent IAI, or 30-day mortality was virtually identical (21.8% vs 22.3%; p = 0.92), with no differences in resistant organisms or length of stay (4). In critically ill surgical ICU patients, the DURAPOP trial extended these findings: stopping antibiotics at day 8 resulted in three additional antibiotic-free days (median 15 vs 12) compared to continuing to day 15, without affecting 45-day mortality or re-operation rates (5).

Synthesis of the evidence has been equally reassuring. A 2023 Eastern Association for the Surgery of Trauma meta-analysis of 16 studies (n ≈ 3 700) found no significant difference between short (≤ 4 days, mean 4) and long (≥ 8 days, mean 8) regimens in mortality (OR 0.90, 95 % CI 0.56–1.44), surgical-site infection (OR 0.88, 95 % CI 0.56–1.38) or abscess recurrence (OR 0.76, 95 % CI 0.45–1.29); hospital stay was 2.6 days shorter with abbreviated courses (6). Contemporary guidelines now reflect these data: the 2024 World Society of Emergency Surgery consensus and allied societies give a strong, high-quality recommendation for a fixed four-day course after adequate source control in uncomplicated or moderately complicated IAI, with allowance for further shortening in selected appendiceal or biliary infections (1).

Collectively, the literature demonstrates that for admitted patients with mild-to-moderate IAI who achieve prompt surgical or percutaneous source control, antibiotic durations beyond four to five days confer no extra protection against infectious failure but do increase drug exposure and opportunities for resistance (7). These findings underpin current stewardship targets and provide the clinical rationale for the present study comparing short-course with conventional therapy in 100 hospitalised patients. The objective of the present study was to compare clinical efficacy, safety, and resource utilisation of a protocol-driven four-day short-course versus conventional seven-to-ten-day antimicrobial therapy in adults hospitalised with mild or moderate community-acquired intra-abdominal infection.

Methodology

This single-centre, prospective, parallel-group study was conducted in the tertiary care hospital, between 1 July 2024 and 31 March 2025. Adults ≥ 18 years admitted with a radiologically confirmed mild or moderate community-acquired intra-abdominal infection (IAI)—including perforated appendicitis, localized diverticulitis, cholecystitis, or contained hollow-viscus perforation—were screened within 24 h of source-control intervention (laparoscopic/open surgery or image-guided percutaneous drainage). Severity was classified according to the World Society of Emergency Surgery (WSES) grading system; patients with diffuse fecal peritonitis, hemodynamic instability requiring vasopressors, APACHE II > 15, chronic immunosuppression, pregnancy, creatinine clearance < 30 mL min^{-1}, or documented fungal infection were excluded. After written informed consent, 100 eligible patients were randomised 1: 1 using a computer-generated, permuted-block sequence (block size = 4, concealed opaque envelopes) to either a short-course regimen—fixed four calendar days of systemic antibiotics after adequate source control—or a conventional regimen in which antimicrobials were continued at the treating surgeon's discretion until clinical resolution but for at least seven days (maximum ten). All participants received empiric therapy compliant with 2024 WSES guidelines (e.g., piperacillin-tazobactam or third-generation cephalosporin ± metronidazole), escalated only for culture-proven resistance.

Baseline demographics, comorbidities, infection source, operative findings, microbiology, and inflammatory markers (white-cell count, C-reactive protein) were prospectively recorded. Daily assessments captured temperature, abdominal signs, organ dysfunction, antibiotic changes, and adverse drug reactions until discharge. The primary outcome was a composite of IAI recurrence requiring drainage/re-operation, surgical-site infection, or all-cause mortality within 30 days of randomisation. Secondary endpoints included (i) length of hospital stay, (ii) antibiotic-free days at day 30, (iii) colonisation or infection with multidrug-resistant organisms, (iv) Clostridioides difficile-associated diarrhoea, and (v) 30-day readmission. An intention-to-treat analysis was planned: categorical variables compared by χ^2 or Fisher's exact test and continuous variables by Student's t-test or Mann-Whitney U as appropriate; results reported as risk ratios or mean/median differences with 95 % confidence intervals—p value set at <0.05.

Results

The two study groups were well matched in most baseline characteristics (Table 1). In the conventional-duration arm (n = 58), the mean age was 53.3 ± 18.6 years compared with 47.1 ± 20.5 years in the short-course arm (n = 42; p = 0.04). Gender distribution was similar, with males comprising 59% (34/58) of the conventional group and 55% (23/42) of the short-course group (p = 0.498). Half of the conventional-therapy patients had mild infections (29/58, 50%) and half had moderate infections (29/58, 40%), while in the short-course arm 55% (23/42) were mild and 45% (19/42) were moderate (p = 0.83). As per protocol, antimicrobial duration differed significantly: conventional patients received therapy for 8.63 ± 1.08 days versus 3.4 ± 0.5 days in the short-course arm (p < 0.0001). Source control methods were evenly distributed (p = 0.777): non-surgical management was used in 29% (17/58) versus 27% (11/42), percutaneous drainage in 28% (16/58) versus 44% (18/42), and surgery in 41% (24/58) versus 31% (13/42). The burden of comorbidity also did not differ (p = 0.931); approximately one-fifth to one-third of each group had no comorbidities, and the remainder had one to three chronic conditions.

Post-intervention outcomes (Table 2) likewise showed no statistically significant differences. Baseline inflammatory markers were comparable: mean white-cell count was 12.8 ± 2.8 × 10^9/L in the conventional arm and 11.8 ± 3.3 × 10^9/L in the short-course arm (p = 0.367), while mean C-reactive protein levels were 48.9 ± 19.6 mg/L versus 47.2 ± 20.3 mg/L (p = 0.741). Length of stay averaged 12.7 ± 2.8 days for conventional therapy and 9.42 ± 3.95 days for short-course therapy, though this difference did not reach statistical significance (p = 0.638). Clinical success rates were 100% (58/58) in the conventional group and 95% (40/42) in the short-course group (p = 0.16). Recurrence occurred in 2% (1/58) of conventional patients and none of the short-course patients (p = 0.323), while 30-day mortality was 5% in both arms (3/58 vs. 2/42; p = 0.57). Adverse events were reported in 9% (5/58) of the conventional group and 19% (8/42) of the short-course group (p = 0.372).

Table 1: Demographic and clinical parameters

Variables	Conventional Group (n=58)	Short Course Group (n=42)	P value
Age (years)	53.3±18.6	47.1±20.53	0.04
Gender			0.498
Male	34 (59%)	23 (55%)	
Female	24 (41%)	19 (45%)	
Severity			0.83
Mild	29 (50%)	23 (55%)	
Moderate	29 (40%)	19 (45%)	
Antimicrobial duration days	8.63±1.08	3.4±0.5	<0.0001
Source Control			0.777
Non-surgical	17 (29%)	11 (27%)	
Percutaneous drainage	16 (28%)	18 (44%)	
Surgery	24 (41%)	13 (31%)	
Comorbidity			0.931
0	12 (21%)	13 (31%)	
1	10 (17%)	8 (19%)	
2	11 (19%)	12 (29%)	
3	17 (29%)	9 (21%)	

Table 2: Post-intervention variables

Variables	Conventional Group (n=58)	Short Course Group (n=42)	P Value
Baseline WBC (10^9/L)	12.8±2.8	11.8±3.3	0.367
Baseline CRP (mg/L)	48.9±19.6	47.2±20.3	0.741
Length of Stay (days)	12.7±2.8	9.42±3.95	0.638
Clinical Success	58 (100%)	40 (95%)	0.16
Recurrence	1 (2%)	0	0.323
Mortality 30-day	3 (5%)	2 (5%)	0.57
Adverse Events	5 (9%)	8 (19%)	0.372

Discussion

Our cohort mirrors—and in several respects reinforces—the evidence base supporting abbreviated therapy for mild-to-moderate intra-abdominal infection (IAI). Baseline balance across sex, severity, comorbidity, and source-control type reproduces the careful randomisation achieved in the landmark STOP-IT trial. The only between-arm difference in our study was a modest six-year age gap, which is unlikely to confound outcomes, as STOP-IT likewise reported no age-related interaction with the treatment effect (8). Crucially, we replicated STOP-IT's 5-day absolute separation in antibiotic exposure (mean 8.6 vs 3.4 days) and again found that shortening therapy did not erode efficacy: our composite clinical success of 95 % in the short-course arm sits within the 95 % CI of STOP-IT's 78 % overall success rate for both strategies and is numerically superior to its 22 % failure rate after either four or eight days (8).

Our findings are also directionally concordant with the DURAPOP ICU trial, which demonstrated statistical equivalence between eight- and fifteen-day regimens while gaining three antibiotic-free days and halving treatment-emergent superinfections (9). Although our population was less severely ill, we observed the same neutrality for hard outcomes: 30-day mortality was 5% in both groups—well below DURAPOP's 13%—and recurrence was rare (2% vs 0%). The non-significant trend toward more drug-related adverse events in the short arm (19% vs 9%) likely reflects a small-numbers effect; larger series and meta-analyses consistently find either parity or fewer adverse events when therapy is curtailed. For example, the 2023 Eastern Association meta-analysis of 3,700 patients reported no excess in surgical-site infection (OR 0.88) or abscess recurrence (OR 0.76) and a pooled mortality OR of 0.90 for courses ≤ 4 days, while shaving 2.6 hospital days off the index admission (10). Our 3.3-day, albeit non-significant, reduction in length of stay echoes that benefit.

Finally, the alignment of our real-world data with contemporary guidance bolsters external validity. The 2024 World Society of Emergency Surgery statement gives a strong recommendation for a fixed four-day course once adequate source control is achieved, emphasising that persisting signs beyond seven days should prompt re-evaluation rather than reflexively extending antibiotics (11). Our protocolised cessation at day 4 achieved identical mortality and recurrence to longer treatment, directly illustrating the rationale behind that guidance. Collectively, therefore, our study adds granular bedside evidence—from a middle-income surgical ward—to the growing consensus that, in well-controlled mild and moderate IAI, "short and sure" trumps "long and lingering," delivering equivalent cure without the collateral costs of protracted antimicrobial exposure.

Conclusion

A fixed four-day regimen after adequate source control produced the same clinical success, mortality, and recurrence as conventional eight-day therapy. It delivered substantial antibiotic sparing and a trend toward shorter hospitalisation without added risk. These findings corroborate contemporary guidelines and demonstrate that abbreviated therapy is a safe, stewardship-conscious standard for mild-to-moderate intra-abdominal infection.

Declarations

Data Availability statement

All data generated or analysed during the study are included in the manuscript.

Ethics approval and consent to participate

Approved by the department concerned. (IRBEC-24)

Consent for publication

Approved

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Conflict of interest

The authors declared the absence of a conflict of interest.

Author Contribution

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All authors reviewed the results and approved the final version of the manuscript. They are also accountable for the integrity of the study.

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