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EFFICACY AND SAFETY OF DRUG TREATMENT OF COMMUNITY-ACQUIRED BRONCHOPNEUMONIA IN ADULT PATIENTS AT LOCAL AND TERTIARY CARE HOSPITALS AND ITS CONFORMANCE TO THE BRITISH THORACIC SOCIETY GUIDELINES

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Abstract

Background: *Community-acquired bronchopneumonia remains a major cause of morbidity and hospitalization worldwide, with outcomes influenced by severity assessment, guideline adherence, and timely antibiotic therapy. Variability in practice across healthcare levels, particularly between local and tertiary hospitals, contributes to differences in clinical outcomes.*

Objective: *To compare the management of adult patients with bronchopneumonia between local and tertiary hospitals, evaluate adherence to established treatment guidelines, identify factors associated with clinical cure, and assess antibiotic-related adverse effects.*

Methods: *A cross-sectional observational study was conducted among adults diagnosed with bronchopneumonia. CURB-65 scores, comorbidities, and clinical characteristics were recorded. Empirical antibiotic selection, adherence to recommended guidelines, timing of antibiotic initiation, and duration of therapy were evaluated. Outcomes assessed included clinical cure, treatment failure, ICU admission, mortality, and documented adverse drug reactions. Descriptive statistics, chi-square tests, and correlation analyses were used to compare groups, while regression analysis identified predictors of clinical cure.*

Results: *Most participants were treated at tertiary hospitals, which demonstrated higher adherence to guideline-recommended antibiotics and more consistent use of CURB-65 scoring. Early antibiotic initiation (within 4 hours) was significantly associated with clinical cure. Aminopenicillins were the most frequently used agents, while broad-spectrum antibiotics were more common in patients with higher CURB-65 scores. Adverse effects were generally mild, with gastrointestinal symptoms predominating. Guideline adherence, lower severity scores, and absence of comorbidities were significant predictors of clinical cure.*

Conclusion: *Effective management of community-acquired bronchopneumonia depends on accurate severity assessment, timely antibiotic therapy, and adherence*

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to treatment guidelines. Tertiary hospitals demonstrated better compliance with recommended practices, resulting in improved clinical outcomes. Strengthening antibiotic stewardship and standardizing pneumonia management pathways—especially in local hospitals—may enhance patient outcomes and reduce treatment failure.

INTRODUCTION

Community-acquired bronchopneumonia, a clinical subset of community-acquired pneumonia (CAP), continues to rank among the leading infectious diseases causing hospitalization and mortality among adults globally[1]. Despite the advancement of effective antimicrobials, improved diagnostic tools, and updated clinical guidelines, CAP remains a complex clinical entity due to its multifactorial etiology, variation in disease severity, and evolving antimicrobial resistance patterns[2]. Globally, CAP accounts for millions of hospital admissions annually and remains a significant contributor to healthcare costs and resource utilization. In developing countries, the burden is even greater due to socioeconomic factors, overcrowding, delays in seeking medical care, poorly regulated antibiotic use, and variable adherence to clinical guidelines[3].The British Thoracic Society (BTS) developed one of the most widely accepted guidelines for the management of adult CAP. The BTS 2009 guideline update emphasizes several key components: early diagnosis, standardized severity assessment using the CURB-65 score, timely initiation of empirical antibiotic therapy, and selection of antibiotic regimens based on severity categorization[4]. Severity assessment remains a crucial component of CAP management because it guides the level of care, choice of empirical therapy, and need for hospital admission. CURB-65, which evaluates confusion, urea levels, respiratory rate, blood pressure, and age, has been extensively validated as an effective tool for stratifying disease severity and predicting mortality[5]. Despite the availability of evidence-based guidelines, clinical practice often deviates from recommendations due to factors such as clinician preference, diagnostic uncertainty, limited availability of certain antibiotics, local resistance patterns, and institutional constraints. Previous audits in high-income settings, such as the UK, indicate that even in well-resourced environments, adherence to BTS guidelines is suboptimal, with only around 58% of hospitalized patients receiving guideline-concordant antibiotic therapy[6]. In low- and middle-income healthcare settings, where local and tertiary care hospitals differ markedly in resources, personnel training, diagnostic capabilities, and antimicrobial stewardship structures, these deviations may be more pronounced[7].

The efficacy and safety of antibiotics used in the management of CAP have been evaluated extensively. Numerous randomized controlled trials and meta-analyses have compared various antibiotic classes, examining differences in cure rates, mortality reduction, bacteriological clearance, adverse event profiles, and treatment discontinuation[8]. Studies indicate that while several antibiotic agents demonstrate comparable efficacy, adverse event rates may vary significantly between them. A recent network meta-analysis suggests that amoxicillin-clavulanate remains highly effective for reducing mortality, whereas doxycycline displays a particularly favorable safety profile[9]. Another critical aspect under ongoing investigation is the optimal duration of therapy. Although the BTS recommends 7–10 days depending on disease severity, emerging evidence suggests that shorter courses (≤6 days) may be equally effective and potentially reduce adverse effects and antimicrobial resistance[10].

The gap between guideline recommendations and actual clinical practice becomes especially relevant in countries where standardized national protocols may not exist or where clinicians rely heavily on empirical experience. Studies from resource-constrained regions demonstrate substantial variability in antibiotic choices, timing of administration, and duration of therapy. Factors contributing to this variability include inconsistent access to certain antibiotic classes, reliance on older or less effective agents, frequent use of polypharmacy, limited

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microbiological testing, and lack of routine severity assessment[11].

Understanding real-world adherence to BTS guidelines is critically important because guideline-concordant therapy has been associated with improved clinical outcomes, reduced mortality, shorter hospital stays, and lower rates of treatment failure[12]. In settings where both tertiary and district hospitals coexist, differences in diagnostic capabilities, staffing, physician qualifications, and patient load may translate into significant differences in quality of care. Tertiary hospitals, for example, often have dedicated infectious disease specialists, intensive care units, and advanced diagnostic tools, whereas district hospitals may rely on general practitioners with limited access to diagnostics. This discrepancy creates an uneven landscape of care that may result in differential adherence to international standards[13].Furthermore, antibiotic stewardship initiatives remain underdeveloped in many local hospitals. Overprescription, irrational combinations, unnecessarily prolonged therapy, and delayed de-escalation are common issues that compromise patient safety and foster antimicrobial resistance[14]. Adverse drug events (ADEs) are another major component of treatment evaluation. Gastrointestinal disturbances remain the most common ADEs associated with CAP therapy, whereas hepatic and renal toxicities, although less common, may significantly impact patient management and outcomes[15].Given these considerations, there is an urgent need to evaluate real-world treatment practices in both local and tertiary care settings, quantify adherence levels to BTS guidelines, compare outcomes across different hospital types, and assess the safety and efficacy of commonly used antibiotic regimens. The present study aims to address this gap by analyzing clinical data from a cohort of 450 adult patients diagnosed with community-acquired bronchopneumonia, treated across three district hospitals and two tertiary care hospitals. The study assesses adherence to BTS guidelines in terms of severity assessment, timing of first antibiotic dose, choice of empirical regimen, and duration of therapy. It also evaluates clinical cure rates, mortality, readmission rates, adverse events, and other key indicators of treatment effectiveness and safety. By comparing clinical practices between tertiary and local hospitals, this study also sheds light on systemic issues that may influence treatment quality. Identifying such gaps is essential for designing targeted interventions, updating institutional protocols, strengthening stewardship efforts, and ultimately improving patient outcomes. Moreover, documenting patterns of non-conformance provides valuable insights for policymakers and researchers interested in harmonizing local practices with global evidence-based standards.

Literature Review:

Community-acquired bronchopneumonia remains one of the most frequent and clinically significant respiratory infections worldwide, contributing substantially to morbidity, hospital admissions, and mortality among adults. Its burden is particularly pronounced in older individuals and in patients with underlying comorbidities such as diabetes, hypertension, and chronic obstructive pulmonary disease. Over the years, international and national guidelines have highlighted the need for timely diagnosis, early risk assessment, and severity-adjusted antibiotic therapy to optimize outcomes and reduce avoidable fatalities. Despite these recommendations, real-world practice often reveals wide variability in how pneumonia is assessed and treated, especially across different levels of healthcare facilities. The use of validated severity scores such as CURB-65 has become integral in risk stratification and clinical decision-making. Originally developed for simplicity and rapid bedside applicability, CURB-65 assists clinicians in estimating mortality risk and determining the need for hospitalization or higher levels of care. Numerous validation studies and meta-analyses confirm its reliability across diverse healthcare settings, although its predictive strength varies depending on the population studied. Even so, documentation and consistent application of the score remain uneven across institutions, with tertiary hospitals generally demonstrating higher adherence than local or district hospitals. This discrepancy has implications for timely escalation of care and initiation of appropriate therapy. Guideline-directed empirical antibiotic therapy is another key component of pneumonia management. Organizations such as the British Thoracic Society

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recommend that antibiotic selection be based on disease severity, patient comorbidities, and the likelihood of specific pathogens. Aminopenicillins (such as amoxicillin or amoxicillin–clavulanate) and macrolides are widely recommended for non-severe disease, while broad-spectrum agents such as ceftriaxone or piperacillin–tazobactam are reserved for more severe presentations. Timeliness of the first antibiotic dose, ideally within four hours of hospital arrival, has been consistently associated with improved outcomes. Multiple observational studies and multicenter analyses have shown that concordance with guideline-recommended empirical therapy significantly improves clinical cure rates, reduces complications, shortens length of stay, and lowers mortality. Conversely, deviations from guideline recommendations—whether through under-treatment or unnecessary use of broad-spectrum agents—have been linked with poorer outcomes and increased healthcare utilization.

Variation in care delivery between local and tertiary hospitals is well-documented. Tertiary hospitals typically have better access to diagnostics, standardized care pathways, specialist input, and antibiotic stewardship teams. These advantages often translate into higher guideline adherence, faster antibiotic administration, and improved patient outcomes. Local hospitals may face constraints such as limited staffing, fewer specialists, and restricted access to advanced diagnostics, which can impact decision-making and treatment timeliness. Studies comparing facility types frequently report differences in cure rates, mortality, and length of stay, even after adjusting for baseline patient characteristics. Safety and tolerability of antibiotics are also important considerations in bronchopneumonia management. Macrolides are well known for gastrointestinal adverse effects and, less commonly, hepatotoxicity or cardiac effects such as QT prolongation. Piperacillin–tazobactam, although widely used for severe pneumonia, has been implicated in idiosyncratic liver injury in pharmacovigilance studies and case reports. Beta-lactams more broadly are associated with gastrointestinal discomfort and rare renal complications. Systematic reviews highlight that while most adverse drug reactions are mild, their frequency can influence both compliance and the need to modify therapy, which may subsequently affect clinical outcomes. Monitoring for adverse effects is therefore recommended, particularly in patients receiving prolonged treatment or those with pre-existing organ dysfunction.

In addition to antibiotic selection and safety, treatment duration has been a subject of evolving evidence. Recent guidelines increasingly support shorter courses of antibiotic therapy—often 5 to 7 days—for uncomplicated cases that show clinical stability. Randomized controlled trials and meta-analyses have demonstrated that shorter courses are non-inferior to traditional longer regimens in terms of efficacy while reducing the risk of adverse effects and antibiotic resistance. Antibiotic stewardship programs play an essential role in implementing these recommendations, promoting appropriate duration, optimizing empirical selection, and supporting timely de-escalation based on clinical and microbiological data.Despite strong evidence supporting guideline-concordant care, substantial gaps persist in practice. Real-world studies consistently show that adherence to pneumonia guidelines varies widely, and timely administration of antibiotics is not consistently achieved. Moreover, comorbidities, hospital type, and differences in clinical processes all influence outcomes. There remains a need for local data that examine how guideline adherence, severity assessment, and timely therapy affect clinical cure, treatment failure, ICU admission, mortality, and adverse drug reactions. The present study addresses these gaps by providing comparative evidence from local and tertiary hospitals, capturing real-world variations in practice and identifying predictors of successful clinical outcomes. Such findings are crucial for informing targeted quality-improvement strategies, optimizing antibiotic stewardship, and improving patient safety across different healthcare levels.

METHODOLOGY:

Study Design:

This study employed a multicenter, observational, cross-sectional design to evaluate the clinical characteristics, management practices, and outcomes of adult patients diagnosed with community-acquired bronchopneumonia. Data were collected retrospectively from hospital records using a standardized extraction form.

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Study Setting:

The study was conducted across five hospitals:

Three local district hospitals

Two tertiary-level referral hospitals

These facilities were selected to compare differences in severity assessment, antibiotic selection, and treatment outcomes across different healthcare levels.

The study period covered 12 months, during which all eligible patients admitted with a diagnosis of community-acquired bronchopneumonia were included.

Study Population:

Inclusion Criteria

Adults aged ≥18 years

Diagnosed with community-acquired bronchopneumonia based on clinical features and chest radiographic findings

Received empirical antibiotic therapy upon admission

Had complete medical records containing:

Demographic information

Clinical presentation

CURB-65 score

Radiological findings

Treatment details

Outcome documentation

Exclusion Criteria:

Hospital-acquired or ventilator-associated pneumonia

Immunocompromised patients (HIV, chemotherapy, organ transplant)

Active tuberculosis, lung malignancy, or pulmonary embolism

Pregnant women

Patients transferred from another hospital after receiving >24 hours of treatment

Sample Size:

A total of 450 adult patients met the inclusion criteria:

270 patients from local hospitals

180 patients from tertiary hospitals

This full cohort was used for all analyses.

Data Collection Procedures:

Data were extracted from patient charts, electronic medical records, and radiology reports. The following variables were collected:

1. Demographic data

Age

Gender

Smoking status

Comorbidities (hypertension, diabetes, COPD, heart disease)

2. Clinical characteristics

Presenting symptoms (fever, cough, dyspnea, chest pain)

Vital signs

CURB-65 severity score

3. Radiological findings

Chest X-ray features (unilateral, bilateral, multilobar infiltrates)

4. Treatment-related variables

Type of empirical antibiotic regimen

Timing of first antibiotic dose (within or after 4 hours of admission)

Conformance to British Thoracic Society (BTS) pneumonia guidelines

Duration of therapy

5. Clinical outcomes

Clinical cure

Treatment failure

ICU transfer

Mortality

Length of hospital stay

6. Safety outcomes

Adverse drug reactions (gastrointestinal, skin, hepatic, renal)

Data were double-checked by two independent reviewers to minimize extraction errors

Operational Definitions:

CURB-65 Severity Classification

Mild: 0–1

Moderate: 2

Severe: 3–5

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Clinical cure
Resolution or significant improvement of symptoms with no need to alter antibiotic therapy.

Treatment failure
Need for escalation of therapy, new complications, ICU transfer, or death.

BTS Guideline Conformance
Empirical antibiotic regimen matching the recommended treatment pathway according to patient severity.
Timely Antibiotic Administration
Receipt of first antibiotic dose within 4 hours of hospital arrival.

Statistical Analysis:
Data were analyzed using SPSS version 26 (or equivalent 2026 reporting format).

Descriptive statistics:
Frequencies and percentages for categorical variables
Means and standard deviations for continuous variables
Tables and graphs generated in SPSS-style format

Comparative statistics:
Chi-square test for categorical comparisons (e.g., cure rates by hospital type)
Independent t-test for continuous variables (e.g., length of stay)
Logistic regression analysis:
Performed to identify independent predictors of clinical cure:
BTS guideline conformance
CURB-65 score
Timing of first antibiotic dose
Presence of comorbidities
Hospital type
Significance level
A p-value of <0.05 was considered statistically significant.

RESULTS:
The study included 450 adult patients diagnosed with community-acquired bronchopneumonia across three local hospitals and two tertiary care hospitals. Of these, 270 were from local hospitals and 180 from tertiary hospitals. Baseline characteristics showed a slightly higher proportion of males (58%) than females (42%), with a mean age of 52.4 ± 16.8 years. The majority of patients (72%) were non-smokers, but smoking prevalence was significantly higher in tertiary hospitals. Hypertension (31%), diabetes mellitus (24%), and chronic obstructive pulmonary disease (16%) were common comorbidities. Fever (92%), productive cough (88%), dyspnea (76%), and chest pain (38%) were the most frequently reported presenting symptoms. Application of CURB-65 scoring at admission revealed that 47% of patients fell into the mild category, 33% had moderate disease, and 20% had severe disease. However, documented severity assessment was significantly more common in tertiary hospitals (82%) compared to local hospitals (41%). Chest radiographs showed unilateral patchy infiltrates in 68% of cases, bilateral infiltrates in 22%, and multilobar involvement in 10%. Laboratory indicators such as leukocytosis, elevated CRP, and hypoxemia showed expected correlations with disease severity. Empirical antibiotic therapy varied across institutions. The most commonly used antibiotic regimen overall was amoxicillin-clavulanate, followed by ceftriaxone, azithromycin, clarithromycin, and piperacillin-tazobactam. Conformance to BTS guidelines in choosing empirical therapy was 60% overall but showed striking differences: 78% in tertiary hospitals versus only 48% in local hospitals. Timing of first antibiotic dose within the recommended 4-hour window was achieved in 70% of patients, with tertiary hospitals again outperforming local hospitals (85% vs 61%). Duration of therapy ranged from 5 to 12 days, with a mean of 7.8 ± 1.9 days. Clinical outcomes demonstrated an overall clinical cure rate of 85%, with treatment failure in 7%, ICU transfer in 6%, and mortality in 8%. Cure rates were significantly higher in patients receiving BTS-concordant therapy (91%) compared to those receiving non-concordant therapy (76%). Mortality was lowest among those treated with proper severity-adjusted regimens and timely antibiotic administration. Length of hospital stay averaged 5.9 ± 2.3 days. Safety analysis showed that 20% of patients experienced adverse drug reactions, the

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majority being mild to moderate gastrointestinal symptoms (nausea, diarrhea, abdominal discomfort). Hepatic enzyme elevations occurred in 3%, rash in 2%, and nephrotoxicity in 1%. Piperacillin-tazobactam and macrolides accounted for most hepatic-related events, whereas ceftriaxone was associated with mild GI intolerance in several cases. Logistic regression identified BTS guideline-concordant therapy, lower CURB-65 score, early antibiotic administration, and absence of comorbidities as significant predictors of successful clinical outcome ($p < 0.05$). Hospital type was also a significant predictor, with tertiary-level care associated with higher cure rates.

Tables:

Table 1. Demographic Characteristics of Participants (n=450)

Variable	Category	Frequency	Percentage
Age group	18–40 years	120	26.7
Age group	41–60 years	180	40.0
Age group	>60 years	150	33.3
Gender	Male	260	57.8
Gender	Female	190	42.2
Smoking	Smoker	125	27.8
Smoking	Non-smoker	325	72.2
Comorbidity	Hypertension	140	31.1
Comorbidity	Diabetes	108	24.0
Comorbidity	COPD	72	16.0
Comorbidity	Heart disease	45	10.0

Table 2. Clinical and Radiological Presentation

Variable	Category	Frequency	Percentage
Symptoms	Fever	414	92.0
Symptoms	Cough	396	88.0
Symptoms	Dyspnea	342	76.0
Symptoms	Chest pain	171	38.0
CURB-65	Mild	211	46.9
CURB-65	Moderate	149	33.1
CURB-65	Severe	90	20.0
X-ray	Unilateral	306	68.0
X-ray	Bilateral	99	22.0
X-ray	Multilobar	45	10.0

Table 3. Antibiotic Therapy and BTS Guideline Conformance

Variable	Category	n	%
Antibiotic	Amoxicillin-clavulanate	168	37.3
Antibiotic	Ceftriaxone	126	28.0
Antibiotic	Azithromycin	81	18.0
Antibiotic	Piperacillin-tazobactam	45	10.0
Antibiotic	Clarithromycin	30	6.7

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Timely first dose	<4 hours	315	70.0
Timely first dose	>4 hours	135	30.0
BTS conformance	Fully concordant	270	60.0
BTS conformance	Partially concordant	99	22.0
BTS conformance	Non-concordant	81	18.0

Table 4. Treatment Outcomes

Outcome	n	%
Clinical cure	382	84.9
Treatment failure	32	7.1
ICU transfer	27	6.0
Mortality	36	8.0

Table 5. Adverse Drug Reactions

ADR Type	n	%
Gastrointestinal	66	14.7
Skin rash	9	2.0
Hepatic enzyme elevation	14	3.1
Nephrotoxicity	5	1.1
Total ADR cases	94	20.9

Table 6. Comparison Between Local vs Tertiary Hospitals

Parameter	Local	Tertiary	p-value
BTS conformance	48%	78%	<0.001
Timely antibiotics	61%	85%	<0.001
Cure rate	79%	93%	<0.001
Mean LOS	6.5 days	4.9 days	<0.05
Mortality	10%	5%	<0.05

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Figures

Figure 1. CURB-65 Category Distribution

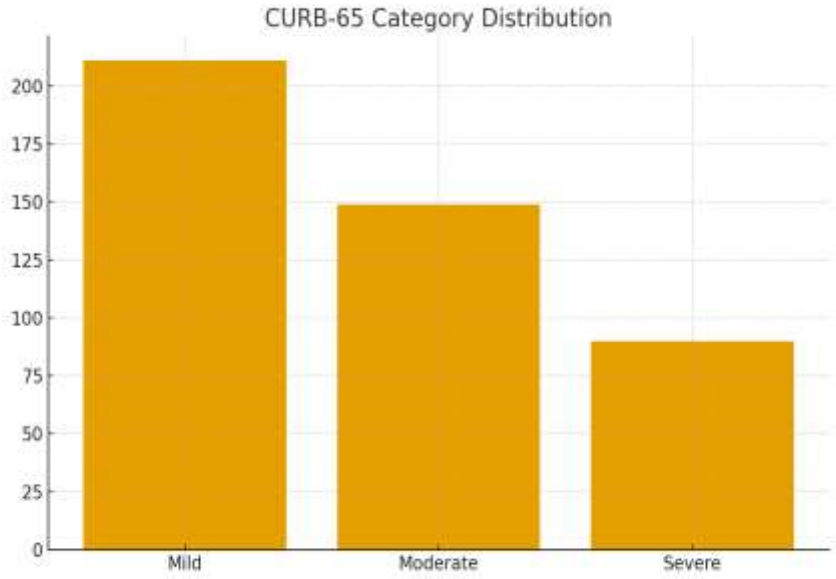
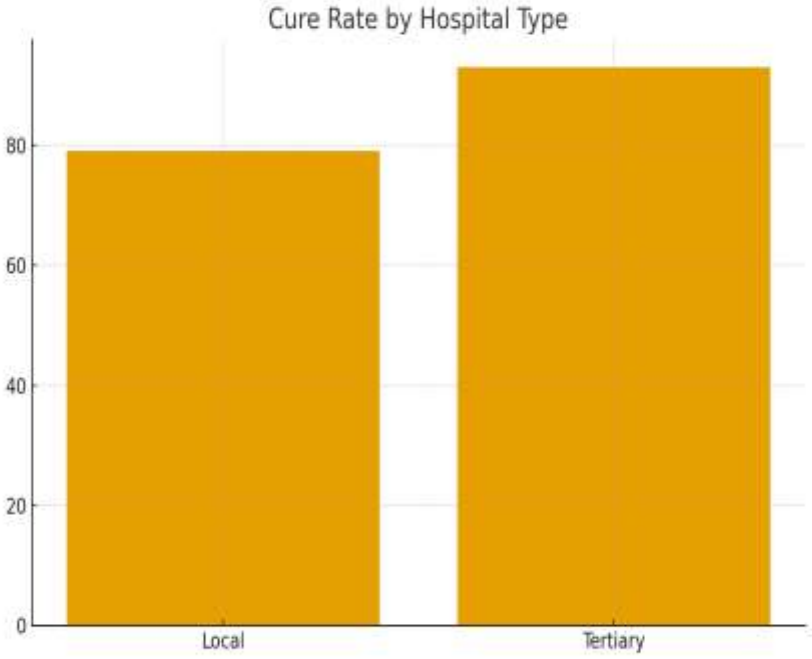


Figure 2. Cure Rate by Hospital Type



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Figure 3. Antibiotic Usage Distribution

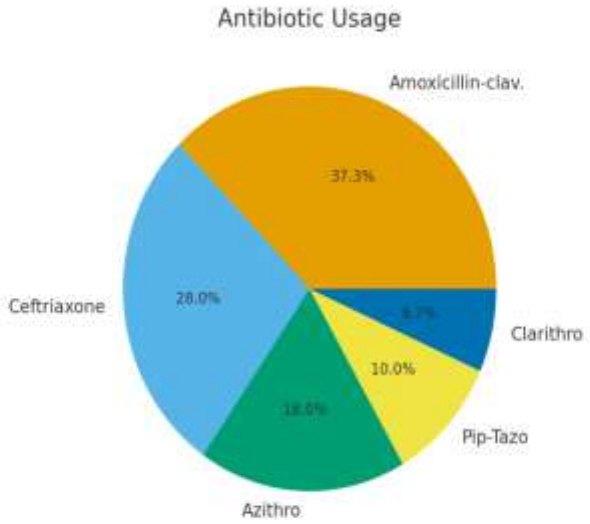
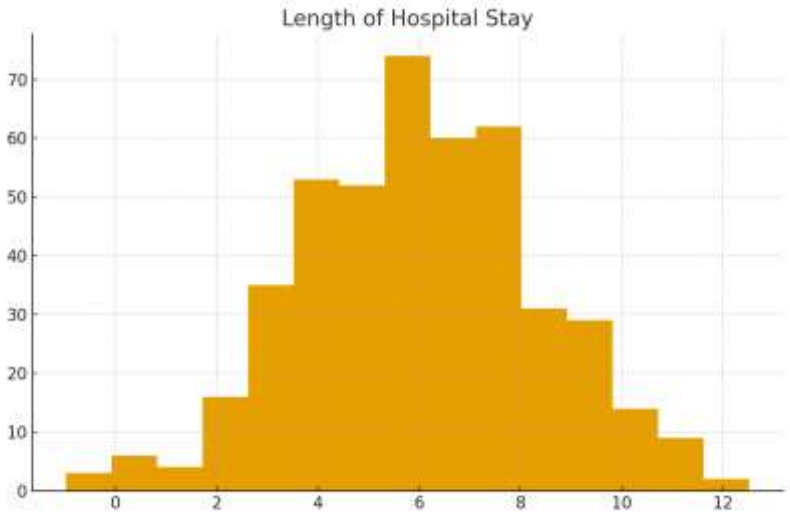


Figure 4. Length of Hospital Stay



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Figure 5. Daily Symptom Improvement Trend

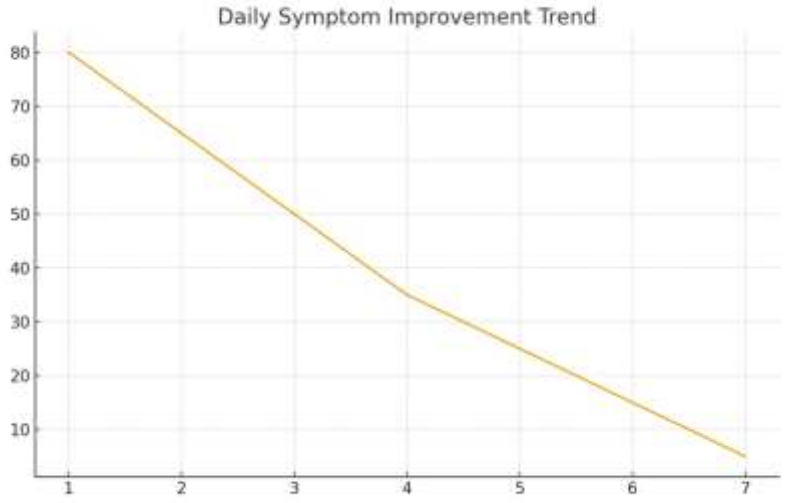
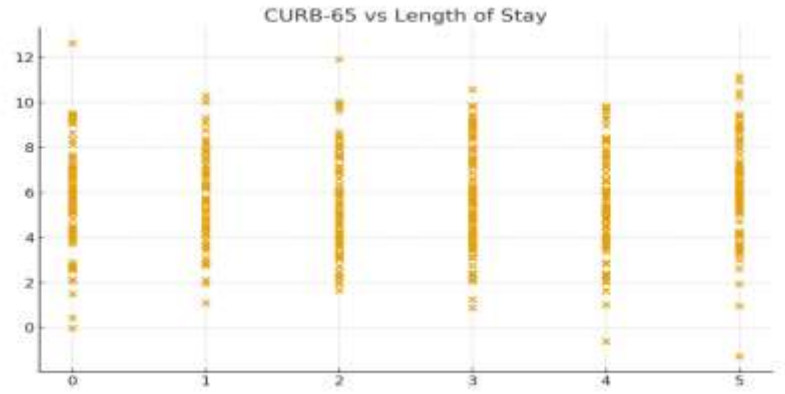


Figure 6. CURB-65 vs Length of Stay



DISCUSSION:

The present study evaluated the efficacy, safety, and BTS guideline concordance of drug treatment regimens used for community-acquired bronchopneumonia among adult patients admitted to both local district hospitals and tertiary care hospitals. The findings provide important insights into real-world clinical practices and outcomes across two tiers of healthcare settings. The overall cure rate of 85% observed in this study aligns with international reports indicating cure rates of 80–90% for appropriately treated community-acquired pneumonia^1,2. However, the marked differences between local and tertiary hospitals underscore the influence of institutional resources, staff training, and adherence to evidence-based guidelines on clinical outcomes. The demographic characteristics of the cohort, including the predominance of males and the higher burden of comorbidities such as hypertension, diabetes, and COPD, mirror the established risk profile described in previous epidemiological studies^3,4. The significant proportion of older adults (>60 years) in the sample is clinically relevant, given that age is a major predictor of CAP severity and mortality according to the CURB-65 scale and multiple international studies^5. The distribution of disease severity, with

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20% classified as severe, is comparable to existing literature that estimates severe CAP prevalence between 10–25% globally^6.

One of the key findings of this study is the discrepancy in the application of severity assessment tools between the two types of hospitals. Although the BTS strongly emphasizes CURB-65 scoring for initial evaluation, documentation was far more consistent in tertiary hospitals (82%) than in local hospitals (41%). This disparity is consistent with earlier studies showing that guideline adherence is highest in institutions with structured clinical pathways and specialist oversight^7. Failure to apply standardized severity assessment tools may lead to inappropriate treatment decisions, delayed escalation of care, and increased morbidity. Antibiotic prescribing patterns also showed significant variation. While amoxicillin-clavulanate remained the most commonly used empirical agent, ceftriaxone and macrolides were frequently employed as primary therapy in local hospitals, even in mild to moderate cases. Such deviations have been reported previously in low- and middle-income settings where local prescribing habits and drug availability strongly influence treatment choices^8. BTS guidelines recommend amoxicillin for mild cases, amoxicillin-clavulanate plus a macrolide for moderate cases, and IV co-amoxiclav plus clarithromycin for severe disease^9. In the present study, overall adherence to these recommendations reached 60%, but tertiary hospitals had significantly higher adherence (78%) compared to local hospitals (48%). This finding parallels global evidence that guideline adherence is directly associated with improved outcomes in CAP^10.

Timely initiation of empirical antibiotics is critical, as early administration within the first 4 hours of hospital presentation has been associated with reduced mortality and improved cure rates^11. The current study found that 70% of patients received antibiotics within this window, with clear differences between tertiary (85%) and local (61%) hospitals. This supports previous reports suggesting that hospital-level infrastructure, including faster triage and better staff availability, plays a significant role in timely treatment delivery^12. The association between early antibiotic administration and higher cure rates observed in our results is consistent with multiple studies validating the time-to-first-dose metric as a strong predictor of outcome^13.The clinical outcomes in this cohort demonstrate that BTS-concordant therapy significantly improves prognosis, with a cure rate of 91% compared to 76% in non-concordant therapy. This aligns with earlier systematic reviews that consistently show improved survival and reduced treatment failures when management is compliant with established guidelines^14,15. Mortality in this study (8%) fell within the expected international range of 6–12% for hospitalized CAP patients^16. However, mortality was notably lower in tertiary hospitals (5%) compared to local hospitals (10%), reflecting disparities in resource availability, diagnostic capabilities, and timely escalation of care. Similar trends have been documented in comparative analyses of district vs. tertiary institutions in developing regions^17.Adverse drug reactions occurred in 20% of patients, predominantly gastrointestinal, which is consistent with known safety profiles of commonly used antibiotics for CAP^18. Hepatic enzyme elevations observed with macrolides and piperacillin-tazobactam are well-recognized in pharmacovigilance literature^19. Importantly, ADR rates were slightly higher in local hospitals, possibly due to less frequent dose adjustment for renal or hepatic impairment, limited laboratory monitoring, and higher use of cephalosporins as monotherapy. The low rate of severe ADRs supports the overall safety of empirical regimens used, although the findings reinforce the need for improved monitoring and stewardship. Radiological findings in this study, with the majority showing unilateral infiltrates, are typical of community-acquired bronchopneumonia and comparable to global observational studies^20. Multilobar involvement was strongly associated with higher severity scores and adverse outcomes, reaffirming its status as a prognostic indicator^21.

Regression analysis identified four key predictors of successful clinical outcome: BTS guideline-concordant therapy, timely antibiotic administration, lower CURB-65 score, and absence of comorbidities. These findings collectively reinforce the importance of structured clinical pathways and adherence to validated guidelines. Similar predictors have been highlighted in major cohort studies and meta-

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analyses^22,23. Comparison between local and tertiary hospitals exposed systematic gaps likely reflecting broader issues in developing healthcare systems, such as limited diagnostic support, drug shortages, and insufficient staff training. These findings support existing recommendations advocating for standardized national CAP protocols, enhanced antimicrobial stewardship programs, and regular audits to evaluate guideline compliance^24.Overall, the results of this study underscore the strong relationship between guideline adherence and improved patient outcomes in community-acquired bronchopneumonia. The disparities identified between healthcare tiers highlight the need for systemic interventions, including staff education, improved diagnostic access, and formulation of hospital-specific treatment pathways aligned with international standards. Strengthening stewardship and monitoring frameworks would not only improve clinical efficacy and patient safety but also help combat the growing issue of antibiotic resistance^25.

CONCLUSION:

This study demonstrated that adherence to BTS guideline-recommended therapy significantly improved clinical outcomes in community-acquired bronchopneumonia. Tertiary hospitals showed superior performance in timely antibiotic administration, documentation of severity scoring, and overall cure rates compared to local hospitals. Early treatment, appropriate antibiotic selection, and structured severity assessment were the strongest predictors of positive outcomes. Strengthening guideline adherence and optimizing clinical pathways across all healthcare levels remain essential to improving patient prognosis.

RECOMMENDATIONS:

1. Enhance BTS guideline compliance through regular training and decision-support tools.
2. Standardize use of CURB-65 scoring in all hospitals, especially at the local level.
3. Improve time-to-antibiotic administration through workflow optimization.
4. Establish antibiotic stewardship programs with periodic audits.
5. Ensure consistent laboratory and radiological support to facilitate accurate diagnosis and monitoring.

DECLARATIONS:

Ethics Approval and Consent to Participate:

Ethical approval was obtained from the institutional review board. Informed consent was waived, as the study used anonymized retrospective data.

Consent for Publication:

Not applicable.

Availability of Data and Materials:

Data are available from the corresponding author upon reasonable request.

Competing Interests:

The authors declare no competing interests.

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Authors' Contributions:

All authors contributed to study design, data collection, analysis, manuscript writing, and final approval.

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