

Antimicrobial Prescribing Patterns Across Major Surgical Departments of a Tertiary Care Teaching Hospital: A Cross-Sectional Study

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ABSTRACT

Background

Antimicrobial use is integral to surgical care for both treatment of established infections and prevention of postoperative infectious complications. However, inappropriate or excessive use, particularly of broad-spectrum agents, contributes to antimicrobial resistance and highlights the need for local prescribing surveillance. This study evaluated antimicrobial prescribing patterns and clinical indications across major surgical departments of a tertiary care teaching hospital.

Methods

A cross-sectional observational study was conducted among 380 patients attending the Outpatient and Inpatient Departments of Orthopaedics, General Surgery, and Obstetrics & Gynaecology who were prescribed at least one antimicrobial agent. Data on demographic characteristics, clinical department, prescribed antimicrobial agent, and indication for antimicrobial use were recorded and analyzed descriptively. The study was conducted after approval from the Institutional Ethics Committee, Government Medical College, Kannauj (Review Letter No. IEC/GMC, Kannauj/37; dated 22/08/2024).

Results

Of the 380 participants, 165 (43.42%) were male and 215 (56.58%) were female, with a mean age of 28.18 ± 6.34 years. Orthopaedics contributed 157 (41.32%) participants, General Surgery 154 (40.53%), and Obstetrics & Gynaecology 69 (18.16%). Amoxicillin-clavulanate was the most frequently prescribed antimicrobial [196 (51.58%)], followed by ceftriaxone [92 (24.21%)], meropenem [40 (10.53%)], piperacillin-tazobactam [34 (8.95%)], amikacin [15 (3.95%)], and metronidazole [3 (0.79%)]. Amoxicillin-clavulanate remained the predominant agent in Orthopaedics [81/157 (51.59%)], General Surgery [89/154 (57.79%)], and Obstetrics & Gynaecology [26/69 (37.68%)]. Meropenem use was proportionally higher in Obstetrics & Gynaecology [14/69 (20.29%)] than in General Surgery [13/154 (8.44%)] or Orthopaedics [13/157 (8.28%)]. Surgical prophylaxis was the most common indication [143 (37.63%)], followed by fractures [121 (31.84%)] and infections [116 (30.53%)].

Conclusion

Antimicrobial prescribing across the three surgical departments was predominantly characterized by the use of amoxicillin-clavulanate and ceftriaxone, while comparatively greater meropenem use was observed in Obstetrics &

Gynaecology. Surgical prophylaxis accounted for the largest proportion of antimicrobial indications. These findings provide a useful local prescribing profile and highlight potential areas for antimicrobial stewardship, particularly monitoring of broad-spectrum agents and perioperative antimicrobial use. Further prospective audits incorporating dose, route, timing, duration, microbiological findings, de-escalation, and guideline concordance are required to assess prescribing appropriateness.

Keywords

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INTRODUCTION

Antimicrobial agents are essential to modern surgical care because they are used both to treat established bacterial infections and to prevent postoperative infectious complications. However, antimicrobial exposure is not without consequences. Inappropriate selection, excessive duration, unnecessary combination therapy, and use of agents with unnecessarily broad spectra can increase adverse drug effects, antimicrobial resistance, and healthcare costs. Antimicrobial stewardship therefore emphasizes selecting the most appropriate agent, dose, route, and duration for a defined clinical indication while minimizing avoidable exposure [1–4].

Surgical practice presents a particularly important setting for stewardship because antibiotics are commonly used for both therapeutic and prophylactic purposes. Surgical prophylaxis is intended to reduce the risk of postoperative surgical-site infection in procedures for which prophylaxis is indicated. Evidence-based guidance recommends appropriate agent selection, administration close to the time of incision, intraoperative redosing when indicated, and limitation of postoperative duration [5]. Inappropriate prolongation of prophylaxis can expose patients to unnecessary antibiotics without providing additional benefit.

International and national stewardship frameworks emphasize the importance of measuring antibiotic use and identifying local prescribing patterns. The WHO AWaRe framework classifies antibiotics according to their importance for empiric treatment and their potential contribution to antimicrobial resistance, thereby providing a practical basis for monitoring and improving antibiotic use [2,3]. In low- and middle-income countries, the WHO recommends facility-level stewardship programmes incorporating prescribing surveillance, standard treatment guidance, education, audit, feedback, and targeted quality-improvement interventions [4,5].

India has substantial variation in antimicrobial use between hospitals and clinical specialties. A multicentre point-prevalence survey across 16 Indian tertiary-care hospitals found that surgical prophylaxis accounted for 28.70% of antimicrobial indications, while third-generation cephalosporins and other broad-spectrum agents were frequently used [6]. A subsequent

multicentre survey of five Indian tertiary-care centres reported surgical prophylaxis as the second most common indication after community-acquired infection, with 32.6% of antimicrobial prescriptions being used for prophylaxis [7]. More recent Indian surveillance has similarly demonstrated high antimicrobial use in adult surgical wards and substantial use of Watch antibiotics [8].

Studies specifically examining surgical prescribing have also identified heterogeneity in antibiotic selection and prophylactic practice. Wattal et al. reported substantial variation in antibiotic prescribing across surgical specialties and demonstrated that feedback and focused educational interventions could modify prescribing behaviour [9]. Studies of surgical prophylaxis in India have documented frequent use of third-generation cephalosporins and inappropriate duration or other deviations from recommended practice [10,11]. Long-term observational data from Indian surgery departments have further shown persistent empirical prescribing and increasing use of Watch antibiotics, reinforcing the need for local stewardship strategies [12].

Against this background, department-specific prescribing surveillance is useful because antibiotic selection may differ according to case mix, surgical specialty, perceived infection risk, and local prescribing culture. Describing the distribution of prescribed agents and their clinical indications can identify areas for focused antimicrobial stewardship, even before detailed appropriateness auditing is undertaken.

Hence, the present study was undertaken to assess antimicrobial prescribing patterns across the Orthopaedics, General Surgery, and Obstetrics & Gynaecology departments of a tertiary care teaching hospital, with particular emphasis on the antimicrobial agents prescribed, their department-wise distribution, and the clinical indications for use.

MATERIALS AND METHODS

Study Design

A hospital-based cross-sectional observational study was conducted among 380 patients attending the major surgical departments of a tertiary care teaching hospital to assess antimicrobial prescribing patterns.

Study Participants

The study included patients attending the Outpatient Department (OPD) and Inpatient Department (IPD) of

Orthopaedics, General Surgery, and Obstetrics & Gynaecology who were prescribed at least one antimicrobial agent. A total of 380 patients were enrolled, comprising 157 patients from Orthopaedics, 154 from General Surgery, and 69 from Obstetrics & Gynaecology.

Study Procedure

Patients fulfilling the study criteria were evaluated for antimicrobial prescribing patterns. Demographic and clinical information was recorded using a structured data collection format. The parameters recorded included age, sex, clinical department, indication for antimicrobial therapy, and antimicrobial agent prescribed.

The antimicrobial agents assessed were amikacin, amoxicillin–clavulanate, ceftriaxone, meropenem, metronidazole, and piperacillin–tazobactam. The indications for antimicrobial use were classified as fractures, infections, and surgical prophylaxis. Antimicrobial prescribing patterns were evaluated in the overall study population and separately across Orthopaedics, General Surgery, and Obstetrics & Gynaecology. The department-wise distribution of individual antimicrobial agents and the distribution of antimicrobial use according to clinical indication were subsequently determined.

Ethical Considerations

The study was conducted after obtaining approval from the Institutional Ethics Committee, Government Medical College, Kannauj (Review Letter No. **IEC/GMC, Kannauj/37**, dated **22 August 2024**). Patient information was maintained confidentially throughout the study.

Outcome Measures

The study outcomes included the frequency and percentage distribution of prescribed antimicrobial agents, department-wise antimicrobial prescribing patterns, and the distribution of clinical indications for antimicrobial use. The demographic characteristics of the study participants were also assessed.

Statistical Analysis

Data were analyzed using descriptive statistics. Categorical variables, including sex, department, antimicrobial agents, and clinical indications, were expressed as frequencies and percentages. Continuous data, including age, were summarized as mean $\pm$ standard deviation (SD) and range. The findings were presented in tables and graphs, as appropriate.

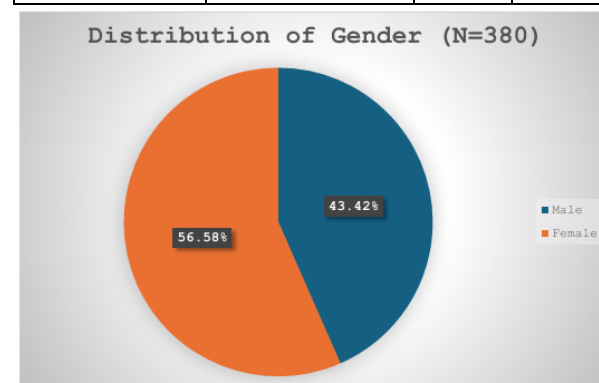
RESULTS

A total of 380 participants were included in the reported analysis. The sample comprised 157 participants from Orthopaedics, 154 from General Surgery, and 69 from Obstetrics & Gynaecology. Overall, 165 (43.42%) participants were male and 215 (56.58%) were female. The mean age was 28.18 ± 6.34 years, with a reported minimum–maximum range of 18–81 years. The

complete demographic distribution is presented in Table 1.

Table 1. Demographic characteristics of the study participants (N = 380)

Characteristic	Category/Value	n	%
Gender	Male	165	43.42
	Female	215	56.58
Age (years)	Mean $\pm$ SD	28.18 $\pm$ 6.34	—
	Minimum–Maximum	18–81	—



Graph 1: Distribution of Gender (N=380)

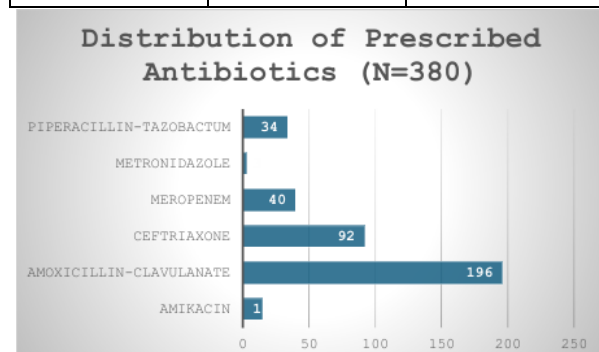
Females constituted 56.58% of the study population, while males accounted for 43.42%. The reported mean age was 28.18 ± 6.34 years. Although the overall age range extended from 18 to 81 years, the distribution of participants across individual age bands was not provided.

Table 1 verification note: The combination of a mean age of 28.18 ± 6.34 years and a maximum reported age of 81 years should be checked against the original dataset or thesis table before submission, because the maximum value is substantially above the reported mean and standard deviation. This is not corrected here because the supplied thesis result is the primary numerical source.

Table 2. Distribution of prescribed antimicrobial agents among study participants (N = 380)

Antimicrobial agent	Frequency (n)	Percentage (%)
Amikacin	15	3.95
Amoxicillin–clavulanate	196	51.58
Ceftriaxone	92	24.21
Meropenem	40	10.53
Metronidazole	3	0.79

Piperacillin–tazobactam	34	8.95
Total	380	100.00



Graph 2: Distribution of Prescribed Antibiotics (N=380)

Amoxicillin–clavulanate was the most frequently prescribed antimicrobial, accounting for 196 (51.58%) prescriptions. Ceftriaxone was the second most common agent, prescribed in 92 (24.21%) participants. Meropenem accounted for 40 (10.53%) prescriptions, while piperacillin–tazobactam, amikacin, and metronidazole accounted for 8.95%, 3.95%, and 0.79%, respectively. Thus, the prescribing profile was dominated by amoxicillin–clavulanate and ceftriaxone, together accounting for 75.79% of the reported prescriptions.

Table 3. Department-wise distribution of prescribed antimicrobial agents (N = 380)

Antimicrobial agent	Orthopaedics n (%)	General Surgery n (%)	Obstetrics & Gynaecology n (%)	Total n (%)
Amikacin	12 (7.64)	3 (1.95)	0 (0.00)	15 (3.95)
Amoxicillin–clavulanate	81 (51.59)	89 (57.79)	26 (37.68)	196 (51.58)
Ceftriaxone	40 (25.48)	32 (20.78)	20 (28.99)	92 (24.21)
Meropenem	13 (8.28)	13 (8.44)	14 (20.29)	40 (10.53)
Metronidazole	0 (0.00)	3 (1.95)	0 (0.00)	3 (0.79)

Piperacillin–tazobactam	11 (7.01)	14 (9.09)	9 (13.04)	34 (8.95)
Total	157 (100.00)	154 (100.00)	69 (100.00)	380 (100.00)

Amoxicillin–clavulanate was the leading antimicrobial in each department, accounting for 51.59% of prescriptions in Orthopaedics, 57.79% in General Surgery, and 37.68% in Obstetrics & Gynaecology. Ceftriaxone was used in 25.48% of Orthopaedics, 20.78% of General Surgery, and 28.99% of Obstetrics & Gynaecology prescriptions. Meropenem represented a larger proportional share in Obstetrics & Gynaecology (20.29%) than in Orthopaedics (8.28%) or General Surgery (8.44%). Piperacillin–tazobactam accounted for 13.04% of prescriptions in Obstetrics & Gynaecology, compared with 7.01% and 9.09% in Orthopaedics and General Surgery, respectively. No amikacin or metronidazole prescriptions were reported in Obstetrics & Gynaecology.

Table 4. Distribution of clinical indications for antimicrobial use (N = 380)

Clinical indication	Frequency (n)	Percentage (%)
Fractures	121	31.84
Infections	116	30.53
Surgical prophylaxis	143	37.63
Total	380	100.00

Surgical prophylaxis was the most common indication for antimicrobial use, accounting for 143 (37.63%) prescriptions, followed by fractures in 121 (31.84%) and infections in 116 (30.53%) participants. These findings demonstrate that prophylactic antimicrobial use constituted the largest proportion of prescribing across the surgical departments, while antimicrobial use for fractures and infections was also substantial.

DISCUSSION

Discussion

In our study, a total of 380 participants receiving at least one antimicrobial were evaluated across Orthopaedics, General Surgery, and Obstetrics & Gynaecology departments. Orthopaedics contributed 157 (41.32%) participants, General Surgery 154 (40.53%), and Obstetrics & Gynaecology 69 (18.16%). Females constituted 215 (56.58%) of the study population compared with 165 (43.42%) males, and the reported mean age was 28.18 ± 6.34 years. The predominance of younger adults in the present study may be related to the inclusion of orthopaedic trauma, surgical, and obstetric/gynaecological cases. The sample size of 380

was smaller than that of Bhattacharjee et al. (2025), who conducted a multicentric point-prevalence survey involving 3,974 hospitalised patients and 4,248 antimicrobial prescriptions across eight tertiary-care hospitals in India [13]. The larger sample in that study reflects its multicentric design, whereas the present study was confined to three surgical departments of a single tertiary-care teaching hospital. Similarly, Ain et al. (2010) evaluated antimicrobial use in both outpatient and inpatient settings of an ENT department, illustrating that the demographic composition of antimicrobial-utilization studies varies considerably according to specialty and patient population [14]. Therefore, differences in age and sex distributions among studies are likely to reflect variations in clinical specialty, referral pattern, study setting, and inclusion criteria rather than prescribing behaviour alone. The reported age range of 18–81 years in the present study, however, should be verified against the original dataset because the maximum value is relatively distant from the reported mean of 28.18 ± 6.34 years.

Regarding the overall antimicrobial prescribing pattern, amoxicillin–clavulanate was the most commonly prescribed antimicrobial in our study, accounting for 196 (51.58%) prescriptions, followed by ceftriaxone in 92 (24.21%), meropenem in 40 (10.53%), piperacillin–tazobactam in 34 (8.95%), amikacin in 15 (3.95%), and metronidazole in only 3 (0.79%). Thus, amoxicillin–clavulanate and ceftriaxone together accounted for 75.79% of all antimicrobial prescriptions. Our findings are consistent with Jain et al. (2014), who reported β -lactam antimicrobial agents as the most commonly prescribed group, accounting for 57.29% of prescriptions [15]. The proportion observed by Jain et al. was slightly higher than the 51.58% contribution of amoxicillin–clavulanate alone in our study, supporting the substantial dependence on β -lactam agents in Indian tertiary-care practice. Similarly, Ain et al. (2010) reported β -lactams as the most frequently prescribed antibacterial class, comprising 45.52% of antibacterial use, and amoxicillin–clavulanate as the leading penicillin combination at 21.74% [14]. Although these findings are directionally aligned with our results, amoxicillin–clavulanate utilization in the present study was more than twice that reported by Ain et al. (51.58% vs. 21.74%). This discrepancy may be explained by differences in clinical setting, as the present study focused on surgical specialties where broad empirical and prophylactic antimicrobial coverage is more frequently required, whereas Ain et al. studied an ENT population.

In contrast to the predominance of amoxicillin–clavulanate in our study, Bhattacharjee et al. (2025) identified ceftriaxone as the most frequently prescribed antimicrobial in their multicentric Indian survey, accounting for 14.9% of prescriptions, followed by metronidazole 10.2%, amikacin 8.7%, piperacillin–

tazobactam 8.7%, and meropenem 7.1% [13]. Compared with these findings, ceftriaxone use was substantially higher in our study (24.21% vs. 14.9%), meropenem use was also higher (10.53% vs. 7.1%), and piperacillin–tazobactam use was comparable (8.95% vs. 8.7%). Conversely, amikacin use was lower in our study (3.95% vs. 8.7%), while metronidazole use was markedly lower (0.79% vs. 10.2%). These differences may be attributable to the broader case mix and multicentric design of Bhattacharjee et al., compared with the exclusively surgical setting of the present study. The very low use of metronidazole in our study is also noteworthy when compared with Mo et al. (2023), who demonstrated that metronidazole remained an important anti-anaerobic antimicrobial in Australian hospitals, although its proportional prescribing declined by approximately 2% between 2013 and 2021 ($p < 0.001$) [16]. Mo et al. suggested that the decline in metronidazole use occurred alongside greater utilization of alternative anti-anaerobic agents, particularly penicillin/ β -lactamase inhibitor combinations [16]. This pattern is compatible with our finding of very high amoxicillin–clavulanate utilization and very low metronidazole prescribing, suggesting a possible institutional preference for single-agent β -lactam/ β -lactamase inhibitor therapy where anaerobic coverage is required.

Department-wise analysis demonstrated important differences in antimicrobial selection. Amoxicillin–clavulanate remained the most frequently prescribed agent in all three departments, comprising 89/154 (57.79%) prescriptions in General Surgery, 81/157 (51.59%) in Orthopaedics, and 26/69 (37.68%) in Obstetrics & Gynaecology. Ceftriaxone accounted for 20.78%, 25.48%, and 28.99% of prescriptions in General Surgery, Orthopaedics, and Obstetrics & Gynaecology, respectively. These findings demonstrate a relatively greater proportional dependence on ceftriaxone in Obstetrics & Gynaecology than General Surgery. The pattern is broadly compatible with Bhattacharjee et al. (2025), in whom ceftriaxone was the leading individual antimicrobial at 14.9%, although our department-specific ceftriaxone proportions were substantially higher, ranging from 20.78% to 28.99% [13]. The difference could reflect greater use of ceftriaxone for perioperative prophylaxis, empirical treatment, and complicated surgical infections in the present hospital.

Meropenem demonstrated the most marked departmental variation. It accounted for 14/69 (20.29%) prescriptions in Obstetrics & Gynaecology compared with 13/154 (8.44%) in General Surgery and 13/157 (8.28%) in Orthopaedics. Thus, the proportional use of meropenem in Obstetrics & Gynaecology was more than twice that observed in the other two departments. It was also substantially higher than the overall meropenem proportion of 7.1% reported by Bhattacharjee et al.

(2025) [13]. Naderi et al. (2018), in an evaluation of meropenem utilization in a referral teaching hospital, emphasized that meropenem is generally reserved for severe infections and infections caused by multidrug-resistant organisms because of its very broad antibacterial spectrum [17]. Therefore, the higher proportion observed in Obstetrics & Gynaecology may reflect complicated obstetric infections, emergency presentations, postoperative infections, or empirical broad-spectrum treatment. However, because microbiological culture results and severity indicators were not evaluated in the present analysis, the appropriateness of this higher meropenem use cannot be established. Piperacillin–tazobactam showed a similar pattern, accounting for 13.04% of prescriptions in Obstetrics & Gynaecology compared with 9.09% in General Surgery and 7.01% in Orthopaedics. The combined higher proportional use of ceftriaxone, piperacillin–tazobactam, and meropenem in Obstetrics & Gynaecology suggests comparatively greater use of broad-spectrum agents in this department and identifies an important area for department-specific antimicrobial stewardship review.

Our department-wise findings also show similarities with previous studies of surgical antimicrobial prescribing. Peddireddy et al. (2021) evaluated antibiotic prescribing in General Surgery using the WHO AWaRe framework and demonstrated substantial use of Access and Watch group agents [18]. Although their analysis was categorized primarily according to AWaRe groups rather than individual antimicrobials, their findings support the observation that β -lactam and broad-spectrum agents constitute a major component of General Surgery prescribing. Skender et al. (2021), in a 10-year observational study of Orthopaedic inpatient departments in Central India, similarly demonstrated persistent and substantial antimicrobial utilization in orthopaedic practice [19]. The high representation of Orthopaedics in our study, accounting for 41.32% of all participants, and the frequent use of amoxicillin–clavulanate (51.59%) and ceftriaxone (25.48%) are therefore consistent with the substantial antimicrobial burden reported in orthopaedic inpatient settings. Nevertheless, differences in individual drug selection between institutions may be influenced by local antibiograms, formulary availability, clinician preference, hospital antimicrobial policy, type of surgical procedure, and severity of infection.

With respect to clinical indications, surgical prophylaxis was the most common reason for antimicrobial use in our study, accounting for 143 (37.63%) prescriptions, followed by fractures in 121 (31.84%) and infections in 116 (30.53%). This pattern indicates that more than one-third of antimicrobial prescribing in the present surgical population was prophylactic rather than therapeutic. Our findings are consistent with Raut et al. (2017), who evaluated antibiotic utilization in a tertiary-care surgery

department and reported substantial antimicrobial use in surgical patients, highlighting the major contribution of perioperative antimicrobial prescribing to total antibiotic exposure [20]. Similarly, Bhattacharjee et al. (2025) reported surgical prophylaxis as one of the leading indications for antimicrobial prescription in their multicentric Indian survey [13]. Their study also found community-acquired infections and surgical prophylaxis to be major indications, demonstrating that antimicrobial exposure in Indian hospitals is frequently driven by both empirical treatment and perioperative prevention.

The high proportion of surgical prophylaxis observed in our study is also supported by findings from Allegranzi et al. (2016), who emphasized that surgical antimicrobial prophylaxis is one of the key evidence-based measures for reducing surgical-site infections, provided that the correct antimicrobial, timing, and duration are used [21]. However, the presence of prophylactic prescribing alone does not establish appropriateness. The Clean Cut Investigators Group (2021) demonstrated that unnecessary extension of postoperative prophylaxis remains an important concern in low- and middle-income countries and evaluated its relationship with surgical-site infection outcomes [22]. Therefore, although 37.63% of prescriptions in our study were for surgical prophylaxis, further information regarding timing before incision, duration after surgery, dose, redosing, and procedure-specific antibiotic selection would be necessary to determine whether these prescriptions complied with accepted prophylactic standards.

Fractures accounted for 31.84% of antimicrobial indications in our study, making them the second most frequent indication. This finding is clinically relevant because orthopaedic trauma represents a major setting for both prophylactic and therapeutic antimicrobial use. Skender et al. (2021) demonstrated considerable antimicrobial exposure in Orthopaedic inpatient departments over a 10-year period in Central India [19]. Their findings support the substantial contribution of fracture and orthopaedic cases to hospital antimicrobial consumption. In contrast, infections represented 30.53% of indications in our study, only slightly lower than fractures and surgical prophylaxis, indicating that therapeutic antimicrobial use remained an important component of overall prescribing. The relatively balanced distribution among surgical prophylaxis (37.63%), fractures (31.84%), and infections (30.53%) suggests that antimicrobial consumption in these departments was not driven by a single clinical indication but instead reflected a mixture of perioperative prophylaxis, trauma-related prescribing, and treatment of established infections.

Overall, the present findings demonstrate a prescribing pattern dominated by β -lactam and broad-spectrum antimicrobial agents. Amoxicillin–clavulanate alone

accounted for 51.58% of all prescriptions, while ceftriaxone contributed a further 24.21%; together, these two agents represented 75.79% of total antimicrobial use. This pattern is broadly consistent with previous Indian studies demonstrating frequent utilization of β -lactams, β -lactam/ β -lactamase inhibitor combinations, and third-generation cephalosporins [13–15]. However, the magnitude of amoxicillin–clavulanate use in our study was considerably higher than that reported in several earlier studies, suggesting a distinct local prescribing preference. Similarly, the disproportionately high meropenem use in Obstetrics & Gynaecology (20.29%) compared with General Surgery (8.44%) and Orthopaedics (8.28%) warrants targeted review because carbapenem exposure is an important driver of resistance and should generally be reserved for clearly defined clinical indications [17].

The findings further emphasize the importance of continuous antimicrobial stewardship in surgical departments. Regular prescription audits, department-specific feedback, promotion of culture-guided therapy, adherence to standard treatment guidelines, and periodic review of antimicrobial selection and duration may contribute to more rational antimicrobial use. The present study primarily focused on antimicrobial prescribing patterns across the three surgical departments. Future prospective studies incorporating microbiological findings, antimicrobial dose, route, duration, timing of surgical prophylaxis, de-escalation practices, treatment modifications, and clinical outcomes may provide a more comprehensive understanding of prescribing practices and further strengthen antimicrobial stewardship strategies in surgical settings.

STRENGTHS AND LIMITATIONS

A major strength of the study was the inclusion of 380 participants from three major surgical departments—Orthopaedics, General Surgery, and Obstetrics & Gynaecology—allowing comparison of antimicrobial prescribing patterns across different surgical specialties. The assessment of both individual antimicrobial agents and their clinical indications provides useful insight into department-specific prescribing practices and may serve as a basis for antimicrobial stewardship interventions. However, the cross-sectional design limits assessment of temporal changes in prescribing practices and causal relationships. Furthermore, detailed evaluation of antimicrobial dose, route, duration, timing of surgical prophylaxis, microbiological findings, antimicrobial susceptibility, de-escalation practices, and guideline concordance was beyond the scope of the study. The single-centre design may also limit the generalizability of the findings to other healthcare settings.

CONCLUSION

This cross-sectional assessment of 380 participants from Orthopaedics, General Surgery, and Obstetrics & Gynaecology demonstrated a distinct antimicrobial

prescribing profile dominated by amoxicillin–clavulanate (51.58%) and ceftriaxone (24.21%). Amoxicillin–clavulanate was the most frequently prescribed agent in all three departments, while meropenem represented a relatively larger proportion of prescribing in Obstetrics & Gynaecology. Surgical prophylaxis was the most common indication (37.63%), followed by fractures (31.84%) and infections (30.53%). These findings indicate important opportunities for local antimicrobial stewardship, particularly around perioperative prescribing and monitoring of broad-spectrum antibiotic use. Further prospective audit should incorporate indication-specific guideline adherence, dose, timing, route, duration, microbiological evidence, de-escalation, and clinical outcomes to determine the appropriateness of the observed prescribing patterns.

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