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HEALTHCARE ASSOCIATED INFECTIONS IN OBSTETRICS AND GYNECOLOGY: A DESCRIPTIVE STUDY AT A TERTIARY CARE HOSPITAL

Obstetrics & Gynaecology

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ABSTRACT

Objective: To determine the spectrum of etiology and incidence of healthcare-associated infections (HAI) in obstetrics and gynecology patients and identify common organisms and their antimicrobial sensitivity patterns. **Methods:** This analytical descriptive study was conducted at Government Raja Mirasudhar Hospital, Thanjavur Medical College from January 2023 to December 2023. A total of 150 patients who developed HAI out of 20,729 admissions were analyzed. Data included demographic characteristics, comorbidities, infection types, microbiological cultures, and antimicrobial sensitivity patterns. **Results:** The prevalence of HAI was 0.723%. Surgical site infections (SSI) were predominant (86.7%), followed by thrombophlebitis/CLABSI (10%) and catheter-associated urinary tract infections (CAUTI) (3.3%). The majority of patients were in the 26-30 age group (39.3%). Obstetric cases comprised 80% of infections. Klebsiella pneumoniae was the most common organism (40.7%), followed by E. coli (12.7%) and Pseudomonas (10.7%). Anemia was the leading comorbidity (16.7%), followed by acute febrile illness (14.7%). Ciprofloxacin showed highest sensitivity (34%), followed by cefotaxime (20%). **Conclusion:** HAI prevalence was relatively low but SSI remained the predominant infection type. Gram-negative organisms, particularly Klebsiella, were most common. Targeted interventions addressing risk factors like anemia and diabetes, along with appropriate antibiotic stewardship, are essential for reducing HAI burden.

KEYWORDS

Healthcare-associated infections, surgical site infection, obstetrics, gynecology, antimicrobial resistance

INTRODUCTION

Healthcare-associated infections (HAIs) represent a significant challenge to patient safety and constitute a major public health concern, particularly impacting quality of life and sometimes causing disability or death. HAIs are infections occurring in patients during or after hospital stay that were not present or incubating at the time of admission[1]. The true burden of HAI remains largely unknown, especially in developing countries where surveillance systems are often inadequate.

Surgical site infections (SSI) are among the most common HAIs, particularly in obstetric and gynecologic procedures. The World Health Organization estimates that approximately 190 million people are hospitalized globally each year, with 9 million developing infections and about 1 million patients dying annually from healthcare-associated infections[2]. In obstetrics, cesarean section rates have increased significantly, accompanied by rising maternal morbidity associated with surgical complications.

Effective surveillance of HAIs enables quality improvement by identifying problems, suggesting interventions, and documenting intervention effectiveness. This approach directs future infection control practices and helps establish appropriate empirical antibiotic therapy targeting the most likely causative pathogens[3].

The primary objective of this study was to analyze HAI data in our institution and prepare baseline information needed to evaluate current practices for preventing common HAIs in obstetrics and gynecology departments.

2. MATERIALS AND METHODS

2.1 Study Design And Setting

This analytical descriptive study was conducted in the Department of Obstetrics and Gynecology at Government Raja Mirasudhar Hospital, Thanjavur Medical College, Tamil Nadu, India.

2.2 Study Period And Population

The study period extended from January 2023 to December 2023. All women admitted to obstetrical and gynecological wards for more than 48 hours who developed signs and symptoms of HAI were included.

2.3 Sample Size

A total of 150 patients who developed HAI out of 20,729 total admissions during the study period were analyzed.

2.4 Inclusion Criteria

- Patients admitted for more than 48 hours
- Those developing symptoms and signs of infection falling into HAI categories
- Patients presenting with SSI features up to 30 days post-surgery

2.5 Exclusion Criteria

- Women with signs of infection on admission
- Women initially managed at other hospitals before transfer

2.6 Data Collection

Parameters analyzed included age, socioeconomic status, admission dates, surgery dates, HAI onset dates, general examination findings, and relevant laboratory investigations including CBC, liver function tests, renal function tests, random blood sugar, coagulation profile, and culture sensitivity reports.

2.7 Statistical Analysis

Data were entered in Microsoft Excel and analyzed using SPSS software v27.0.

Continuous variables were represented as mean ± standard deviation, while categorical variables were presented as frequencies and percentages. Chi-square test was used for categorical variable associations, with $p<0.05$ considered significant.

3. RESULTS

3.1 Demographics And HAI Prevalence

Out of 20,729 patients admitted during the study period, 150 developed HAI, yielding a prevalence of 0.723%. The age distribution showed that the highest proportion of patients (39.3%) was in the 26-30 age group, followed by 21-25 years (32%) (Table 1). Obstetric cases comprised 80% of HAI cases, while gynecological cases accounted for 20%.

Table 1: Age Distribution Of HAI Patients

Age Group	Frequency	Percentage
<20	12	8.0
21-25	48	32.0
26-30	59	39.3
30-35	16	10.7
>35	15	10.0
Total	**150**	**100.0**

3.2 Types Of HAI

Surgical site infections were the most common HAI type, accounting for 130 cases (86.7%).

Thrombophlebitis/CLABSI occurred in 15 cases (10%), and CAUTI in 5 cases (3.3%). No cases of ventilator-associated pneumonia were recorded (Figure 1).

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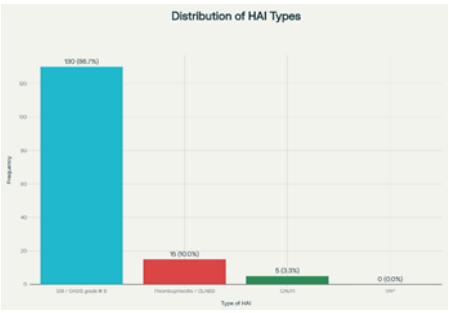

3.3 Comorbidities

Anemia was the most prevalent comorbidity (16.7%), followed by acute febrile illness on admission (14.7%), gestational hypertension (13.3%), and gestational diabetes mellitus on medical nutrition therapy (9.3%) (Figure 3). Other significant comorbidities included hypothyroidism (7.3%) and various forms of diabetes.

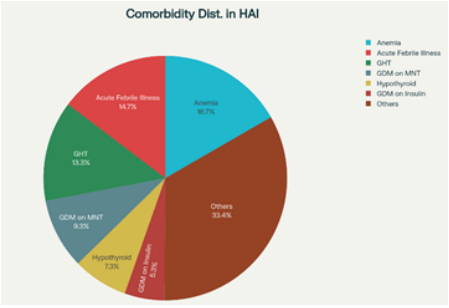

Table 2: Distribution Of Comorbidities

Comorbidity	Frequency	Percentage
Anemia	25	16.7
Acute Febrile Illness	22	14.7
GHT	20	13.3
GDM on MNT	14	9.3
GDM on Insulin	8	5.3
Hypothyroid	11	7.3
Others	50	33.4

3.4 Hospital Stay Duration

The majority of patients (45.3%) had hospital stays of 5-10 days, while 37.3% stayed 11-14 days. Extended stays >15 days occurred in 4% of cases, predominantly in gynecological patients.

3.5 Microbiological Profile

Klebsiella pneumoniae was the most frequently isolated organism (40.7%), followed by E. coli (12.7%) and Pseudomonas species (10.7%) (Figure 2). Other organisms included Proteus (3.3%), Acinetobacter (2%), MRSA (2.7%), and MRCONS (1.3%). No growth was observed in 26.7% of cultures.

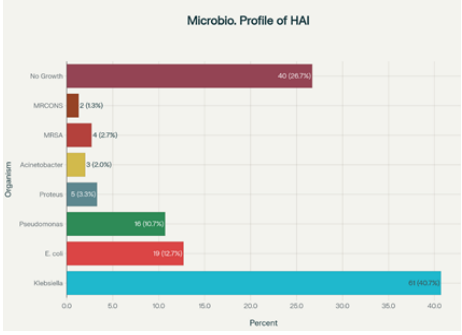

Table 3: Microbiological Profile Of Isolated Organisms

Organism	Frequency	Percentage
Klebsiella	61	40.7
E. coli	19	12.7
Pseudomonas	16	10.7
Proteus	5	3.3
Acinetobacter	3	2.0
MRSA	4	2.7
MRCONS	2	1.3
No Growth	40	26.7
Total	**150**	**100.0**

3.6 Antimicrobial Sensitivity

Ciprofloxacin demonstrated the highest sensitivity rate (34%), followed by cefotaxime (20%), heparin (9.3%), and amikacin (6.7%). Meropenem and piperacillin-tazobactam showed sensitivity rates of 4.7% and 5.3%, respectively.

Table 4: Antibiotic Sensitivity Pattern

Antibiotic	Frequency	Percentage
Ciprofloxacin	51	34.0
Cefotaxime	30	20.0
Heparin	14	9.3
Amikacin	10	6.7
Piperacillin-Tazobactam	8	5.3
Gentamycin	7	4.7
Meropenem	7	4.7
Others	23	15.3

3.7 Management Outcomes

Secondary suturing was required in 68.7% of SSI cases, while 31.3% were managed conservatively with dressings and appropriate antibiotic therapy.

4. DISCUSSION

This study revealed an HAI prevalence of 0.723%, which is relatively low compared to other developing country studies. However, the predominance of SSI (86.7%) aligns with findings from similar studies in Fiji, Ghana, Malawi, Nigeria, and Pakistan, where SSI accounted for 32-40% of all HAIs [4,5].

The age distribution showed peak incidence in the 26-30 year group (39.3%), suggesting no clear correlation between age and SSI likelihood, contrary to some previous studies. This finding differs from research by Kamat et al., who reported increased SSI incidence with advancing age[6].

The microbiological profile demonstrated predominance of gram-negative organisms, with Klebsiella pneumoniae being most common (40.7%). This finding correlates with studies by Devi et al. but contrasts with some reports where E. coli was predominant[7]. The high proportion of Klebsiella infections suggests potential nosocomial transmission and emphasizes the need for strict infection control measures.

Anemia emerged as the leading risk factor (16.7%), consistent with findings by Jahan et al., who reported anemia as a risk factor in 52% of SSI patients[8]. This highlights the importance of preoperative anemia correction in reducing SSI rates. The presence of diabetes in various forms (18.6% combined) aligns with established literature identifying diabetes as a significant SSI risk factor.

The antibiotic sensitivity pattern showed ciprofloxacin as the most effective agent (34% sensitivity), followed by cefotaxime (20%). This differs from many studies reporting high resistance rates among gram-negative organisms to commonly used antibiotics[9,10]. The relatively good sensitivity profile may reflect appropriate antibiotic stewardship practices in our institution.

The high secondary suturing rate (68.7%) indicates significant morbidity associated with SSI, leading to prolonged hospital stays and increased healthcare costs. This emphasizes the importance of preventive measures and early intervention strategies.

5. CONCLUSION

Healthcare-associated infections, particularly surgical site infections, remain a significant concern in obstetric and gynecologic practice. The predominance of gram-negative organisms, especially Klebsiella pneumoniae, necessitates targeted infection control measures and appropriate empirical antibiotic therapy.

Key Recommendations Include:

- Preoperative optimization including anemia correction and glycemic control
- Implementation of strict aseptic techniques and infection control protocols
- Rational antibiotic use based on local sensitivity patterns

- Enhanced surveillance and early detection systems
- Staff education on HAI prevention strategies

The study's findings provide valuable baseline data for developing institution-specific HAI prevention protocols and antibiotic policies. Continuous surveillance and periodic review of antimicrobial sensitivity patterns are essential for maintaining effective infection control practices and improving patient outcomes.

Conflict Of Interest: The authors declare no conflict of interest.
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Ethical Approval: The study was conducted according to ICMR guidelines with appropriate ethical clearance.

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