



ANTIBIOTIC PROFILE IN POST-OPERATIVE OBSTETRIC PATIENTS: A RETROSPECTIVE STUDY

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ABSTRACT

Background: Surgical site infections are common problem in the postoperative patients since ages especially in obstetrical operation. Antibiotics are used routinely in the clinical practice in the post operative cases. There is a need for a very few classes of drugs and for a short duration. Antimicrobial agents play a very important role in prophylaxis as well for the treatment. But most of the antimicrobials are used rampant postoperatively. Hence this study is undertaken to evaluate the use of antibiotics in postoperative obstetric patients. **Objective:** To assess antibiotic profile in post operative patients of obstetric department. **Methods and material:** The data of post operative obstetrics patients of a tertiary care hospital were collected from the medical record department of BIMS over a period of one year. 105 case records collected were entered in predesigned proforma. The data was analyzed using various drug use indicators given by the WHO in our retrospective study. **Results:** A total 105 cases were analysed, percentage of patients prescribed with antibiotics were 100%. Most of the antibiotics prescribed were with brand names (70%) and generic names (30%). Cefotaxime, third generation cephalosporins was the most commonly prescribed antimicrobial agent (98.09%), followed by gentamicin (93.33%) and metronidazole (93.33%). Most of the patients along with antibiotics received more than 6 drugs and their hospital stay was also extended. **Conclusion:** Multiple antimicrobial agents were used for prophylaxis and postoperatively in the obstetric patients. The present study is intended to be a step in broader evaluation of safe and efficacious use of antibiotics in patients.

KEYWORDS: Obstetrics, operations, antibiotics, postoperative infections.

INTRODUCTION

Surgical site infections (SSIs) are defined as wound infections that occur after invasive procedures and is the most common infections, accounting for 14–16% of all nosocomial infections in hospitalized patients.^[1]

Surgical site infections are a common complication of any kind of surgeries, including obstetric surgeries. Due to high rates of post-operative infection, antibiotic prophylaxis play a major role in improving outcomes.^[2] Caesarean section is one of the most common surgical procedures performed in medical practice worldwide and commonly performed procedure in obstetrics and gynaecology practice.^[3] Caesarean sections are associated with a 20-fold increased risk of infection compared to vaginal delivery. Thus increase in caesarean delivery rates has led to, increase in maternal morbidity and mortality.^[4] Most maternal deaths occur during the intrapartum and immediate postpartum period from preventable or treatable causes.^[5] As infection continues to be a common postoperative complication in both developed and developing countries worldwide, the

importance of antimicrobial prophylaxis has emerged to be an effective agent in reducing the incidence of postoperative wound infections. It reduces the risk of resident bacteria overcoming the immune system in the immediate postoperative period.^[6]

The ideal therapy approach to microbial infections should be based on the evaluation of individual isolate susceptibility pattern.^[7] Most of the antimicrobial agents are used inappropriately in the postoperative patients. Thus, this study has been undertaken to assess antibiotic profile in post-operative patients in obstetric department of tertiary care hospital BIMS.

MATERIALS AND METHODS

A Retrospective study was done in the department of obstetrics, Belagavi Institute of Medical Sciences, Belagavi. After obtaining approval and clearance from the Institutional Ethics Committee. A total of 105 inpatient case records were collected from May 2015 to April 2016. The patients those who fulfilled inclusion and exclusion criteria were included in our study. All

patients who had undergone commonly performed obstetrical operations [LSCS, MTP] and patient above 18 years of age were included. Patients who had normal delivery and those patients who were referred to higher centers were excluded from our study.

The data was analysed using various drug use indicators given by the WHO, as age wise distribution, diagnosis of included patients, type of operation performed, type of drugs especially antibiotics prescribed to the patients and duration of hospital stay.

Statistical methods

The present study was analysed by descriptive and inferential statistical analysis. Data was analysed on software using SAS 9.2 and R environment ver.2.11.1. Microsoft word and excel to generate graphs, tables have been used.

RESULTS

A total 105 case records were selected based on the inclusion criteria in obstetric department and were analyzed, out of the common age group undergoing obstetrical operations were in the age group of 21-25 years (58.09%) with mean age 25.68 ± 3.25 , while the least were in the age group of less than 20 years (2.85%) is shown in "Fig. 1".

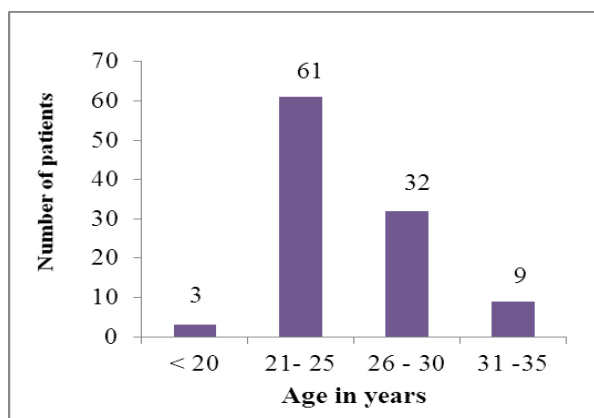


Figure 1: showing age-wise distribution

Statistically significant ($\chi^2=70$, $p<0.001$)

Table 1: Percentage of antibiotics prescribed.

Sl. No.	Antibiotics	Group of drug	Frequency	Percentage
i)	Cefotaxime	Cephalosporins	103	98.09 %
ii)	Gentamycin	Aminoglycosides	98	93.33 %
iii)	Metronidazole	Nitroimidazole	98	93.33 %
iv)	Cefixime	Cephalosporins	49	46.66 %
v)	Amoxicillin	Penicillins	51	48.57 %
vi)	Tinidazole	Nitroimidazole	51	48.57 %

Antimicrobial agents were started initially by parenteral route preoperatively followed by oral route postoperatively until the patient was discharged.

The common operations performed in obstetric patients were elective LSCS (51.42%), followed by emergency LSCS (40.95%) was statistically significant and MTP (7.61%) which includes suction evacuation and dilatation and curettage shown in the "Fig. 2".

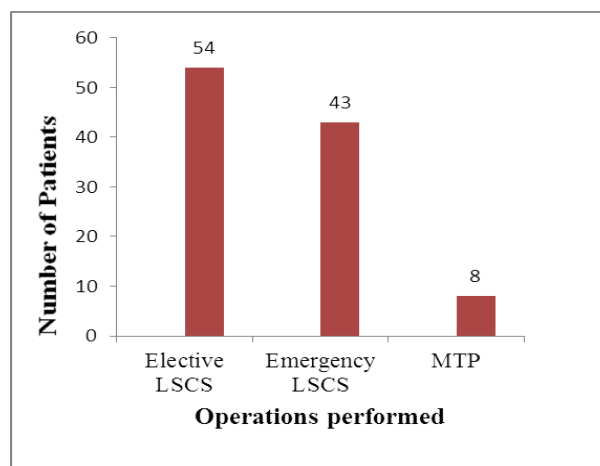


Figure 2: Type of surgeries performed.

Statistically significant ($\chi^2 = 29.84$, $p<0.001$)

"Table 1" depicts the different groups of antibiotics prescribed to the inpatients who had undergone obstetrical operations. Cefotaxime was the most common antibiotic prescribed (98.09%).

In our study 51 patients received 4 different types of antibiotics, which includes both parenteral as well as oral antibiotics is shown in the "Fig. 3".

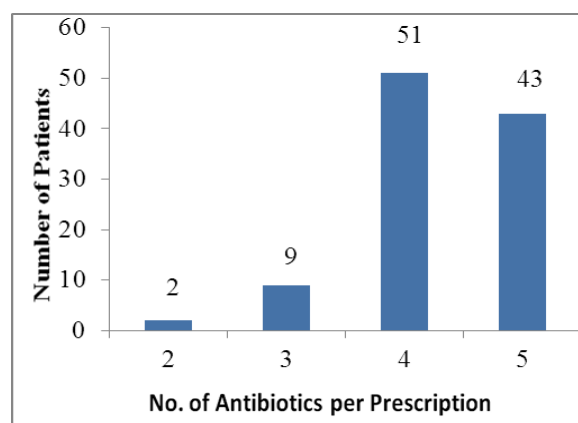


Figure 3: showing number of antibiotics prescribed per prescription

Table 3: showing combination of antibiotics given to patients

Combination of antibiotics given by parenteral route	Number of patients (n=100)	Percentage
Cefotaxime, Gentamycin, metronidazole	96	91.42%
Combination of antibiotics given by oral route		
Cefixime	49	46.66%
Amoxicillin, Tinidazole	51	48.57%

Each prescription contains more than 5 drugs, which includes antibiotics, analgesics, antiulcer drugs, 75% of patients received 6-10 and 25 % of patients received 11-15 drugs per prescription which includes both oral and parenteral route.

Postoperative stay of patients in hospital was uneventful. 67.61% of patients stayed for 5-10 days, 31.42% of patients for 11-15 days and 0.95% of patients for 16-20 days which was statistically significant shown in the "Fig. 4".

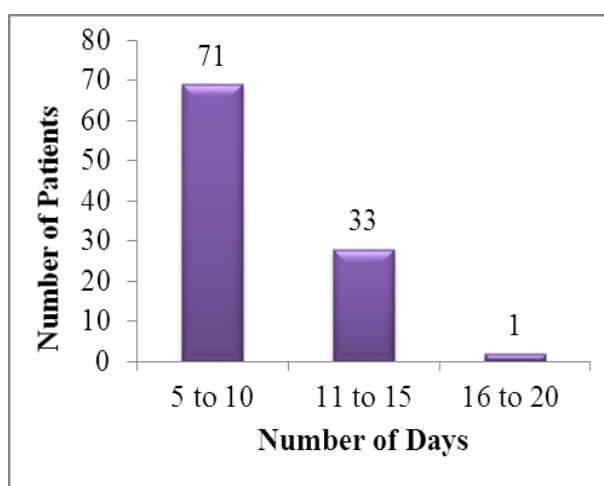


Figure 4: showing the duration of hospital stay
Statistically significant ($\chi^2=66.72$, $p<0.001$).

DISCUSSION

A total 105 cases were analysed in our study, out of which most common age group undergoing obstetrical

Our study also showed that most of the antimicrobial agents were given as a combination therapy to all the patients who underwent obstetrical operations shown in "Table 3". Combinations of cefotaxime, metronidazole and gentamicin were commonly given parenterally in average of 4-5 days followed by combination of amoxicillin and tinidazole (48.57%) or cefixime alone (46.66%) orally for 3-5 days during postoperative period.

operations is 21-25 years (58.09%) with mean age 25.68 ± 3.25 and our data is in consistent with other study reported, where the mean age of obstetric patients was also 25 ± 2.5 years^[8], our data is supportive with the reproductive age group.

Common operations performed in obstetric patients were elective LSCS (51.42%), followed by emergency LSCS(40.95%) and MTP (7.61%) which includes suction evacuation and dilatation and curettage which is contradicted with the findings of one of the study showing, 71% underwent emergency operation and 29% patients had elective operation, who were infected with chorioamnionitis.^[9]

In our study, patients undergoing surgeries in obstetrics department, antimicrobial agents like cefotaxime was started initially by parenteral route preoperatively for about 60 mins before surgery and other antibiotics after the surgery. Following 4-5 days, antibiotics were changed to oral route postoperatively until the patient had been discharged, which is in comparable with other study which reported the importance of preoperative incisional antibiotics which can significantly reduce the rate of SSIs^[10], few studies have shown that administration of antibiotics within 30–60 minutes of surgery will be optimal, which will maximizes tissue and blood antibiotic concentrations at surgical sites^[11,12,13] hence this gives a concern about starting of antibiotics which should be at proper timing in relation to surgical incision.^[14]

Broad-spectrum antibiotics should be started, once the possible diagnosis of postoperative infection is made, most of the patients will respond to the treatment within 24 to 48 hours when relevant antibiotics are prescribed.^[15] Although, cefazolin meets all the criteria of ideal antibiotic,^[16] but this drug was not available as free from the hospital supply and hence was not used. According to an Advisory Statement from the National Surgical Infection Prevention Project regarding antimicrobial prophylaxis for surgery, it was found that resistance developed in patients who were continued with antibiotics for 4 days postoperatively as compared to patients who received only three perioperative doses.^[17]

In our study, combination of cefotaxime, metronidazole and gentamicin (91.42%) were commonly given parenterally in average of 4-5 days followed by combination of amoxicillin and tinidazole (48.57%) or cefixime alone (46.66%) orally for 3-5 days to all the patients during postoperative stay, our data is synonymous with the findings from study by reported as combination of cefotaxime, metronidazole and gentamicin were used in postoperative obstetric patients was 79.74%.^[18]

Each prescription contains more than 5 drugs, which includes antibiotics like cefotaxime, gentamycin, metronidazole, cefixime, amoxicillin or tinidazole and analgesics like diclofenac or tramadol and antiulcer drugs like pantoprazole, rantac. 75.2% of patients received 6-10 and 24.76% of patients received 11-15 drugs per prescription which includes both oral and parenteral route. In our study, average number of drugs per patient was 9.64. Using multiple medications will lead to unnecessary challenges like adverse drug reactions, drug to drug interactions. Out of 10 drugs prescribed 70% drugs were prescribed by brand names and drugs prescribed by their generic names were 30%. In a similar study 52.6% were generic and 47.3% brand name.^[19] use of generic name is recommended for rational drug use regard to safety and cost. In one study found that the length of hospital stay has shown an increase in major polypharmacy compare to minor polypharmacy.^[20]

Duration of hospital stay indicates the prognosis of patient health, but in our study postoperative obstetric patients did not had any signs of infection and their postoperative stay in hospital was uneventful, most of the patients stayed for 5-10 days. A study which reported that incidence of post operative wound infection was more in emergency obstetric patients (51.17%) and also suggested that infection in a post operative wound and increased duration of antibiotic therapy increases the length of stay in the hospital.^[21]

Limitations of the study

- i) We had relatively small sample size, resulting in lack of confidence statements.
- ii) The reliability of information about antibiotics in the medical records, it is possible that antibiotics may have been prescribed in reality, but that it was not stated in the discharge summary or vice versa.
- iii) The information regarding days of therapy was incomplete on several occasions, prediction of days of hospital stay and treatment was only based on details available in medical record.

CONCLUSION

In our study, all the patients were prescribed antibiotics. Most of the antibiotics prescribed were in brand names. Combinations of drugs are frequently used. There is a need to create awareness by continuing medical education programs regarding rational drug use. Routine auditing of prescription will also help in improvement of proper use of drugs and to provide good health care economically. Clinicians should follow the clinical practice guidelines for antimicrobial surgery for prescribing antibiotics in post operative patients.

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REFERENCES

1. Edgard Silva Garcia, Daniela Francescato Veiga, Joel Veiga-Filho, Isaías Vieira Cabral, Natália Lana Larcher Pinto, Neil Ferreira Novo, Miguel Sabino Neto, Lydia Masako Ferreira. Antibiotic prophylaxis in reduction mammoplasty: study protocol for a randomized controlled trial. *Trials* 2016; 17: 567-73.
2. Clifford V, Daley A. Antibiotic prophylaxis in obstetric and gynaecological procedures: A review. [Online]. 2012; Available from: URL:<http://onlinelibrary.wiley.com/doi/10.1111/j.1479828X.2012.01460.x/abstract>.
3. Lomangisi D Dlamini, Musa Sekikubo, Janat Tumukunde, Charles Kojjo, Davidson Ocen, Agnes Wabule, Arthur Kwizera. Antibiotic prophylaxis for caesarean section at a Ugandan hospital: a randomised clinical trial evaluating the effect of administration time on the incidence of postoperative infections. *BMC Pregnancy and Childbirth* 2015; 15: 91-97.
4. Denis Rwabizi, Stephen Rulisa, Findlater Aidan, Maria Small. Maternal near miss and mortality due to postpartum infection: a cross-sectional analysis from Rwanda. *BMC Pregnancy and Childbirth* 2016; 16: 177-181.
5. Richard Kalisa, Stephen Rulisa, Thomas van den Akker, Jos van Roosmalen. Maternal Near Miss and quality of care in a rural Rwandan hospital. *BMC Pregnancy and Childbirth* 2016; 16: 324-331.

6. Hansa Dhar, Ibrahim Al-Busaidi, Bhawna Rathi, Eman A. Nimre, Vibha Sachdeva, Ilham Hamdi. A Study of Post-Caesarean Section Wound Infections in a Regional Referral Hospital, Oman. *SQU Medical Journal* 2014; 14(2): 211-217.
7. Wang FJ, Lyu Y, Liu ZH, Li Y, Cui LQ. In vitro Activity of Different Antibacterial Agents in Combination with Each Other against Multidrug-resistant *Acinetobacter baumannii*. *Chin Med J* 2016; 129: 2388-9.
8. Nausheen S, Hammad R, Ambreen Khan. Rational use of antibiotics-a quality Improvement initiative in hospital setting. *J Pak Med Assoc* 2013; 63(1): 60-4.
9. Al Jama FE. Risk factors for wound infection after lower segment cesarean section. *Qatar Medical Journal* 2012; 2
<http://dx.doi.org/10.5339/qmj.2012.2.9>.
10. Dogra BB, Kalyan S, Rana KV, Panchabhai S, Kharade K, Priyadarshi S. A study comparing preoperative intra-incisional antibiotic infiltration and prophylactic intravenous antibiotic administration for reducing surgical site infection. *Med J DY Patil Univ* 2013; 6: 405-9.
11. Gourisankar K, Lall SS, Mukherji J, Roy H, Bhattacharyya SK, Hazra A. A randomized controlled trial comparing two different antibiotic regimen for prophylaxis at cesarean section. *J Obstet Gynecol India* 2012; 62(1): 35-38.
12. Campillo F, Rubio JM. Comparative study of single dose cefotaxime and multiple doses of cefoxitin and cephazolin as prophylaxis in gynaecologic surgery. *Am J Surg* 1992; 164(4): 12-15.
13. Tita ATN, Rouse DJ, Blackwell S, Saade GR, Spong CY, Andrews WW. Emerging Concepts in Antibiotic Prophylaxis for Cesarean Delivery: A Systematic Review. *Obstetrics & Gynecology* 2009; 113(3): 675-82.
14. Mangram AJ, Horan TC, Pearson ML, Silver LC, Jarvis WR. Guideline for Prevention of surgical site infection 1999. Centers for Disease Control and Prevention (CDC) Hospital Infection Control Practices Advisory Committee. *American Journal of Infection Control* 1999; 27: 97-132.
15. Jaiyeoba O. Postoperative infections in obstetrics and gynecology. *Clin Obstet Gynecol* 2012; 55(4): 904-913.
16. Selcuk Kaya, Seyhan Aktas, Seniha Senbayrak, Recep Tekin, Nefise Oztoprak, Firdevs Aksoy et al. An Evaluation of Surgical Prophylaxis Procedures in Turkey: A Multi-Center Point Prevalence Study. *Eurasian J Med* 2016; 48: 24-8.
17. Bratzler DW, Houch PM. Antimicrobial prophylaxis for surgery: An advisory statement from the national surgical infection prevention project. *Clin Infect Dis* 2004; 38: 1706-14.
18. Chavda Falguni, Karelia Bharti N, Singh Anil P. Use of antimicrobial prophylaxis for obstetric and gynecological surgeries and sensitivity pattern of infective organisms. *WJPPS* 2014; 3(6): 1170-1180.
19. Lakshmi susheela T, Jaya jyothi, Mahendra T, Sam Jeeva kumar E. Drug utilization evaluation for postoperative patients in obstetric and gynecological department in tertiary care hospital. *WJPPS* 2016; 5: 1342-56.
20. Mohammed SS, Sreenath MK, Vishnu VG, Jose F, Siraj ST, Anand VPR. The prevalence of polypharmacy in south indian patients: A Pharmacoepidemiological Approach. *Indian Journal of Pharmacy Practice* 2012; 5(3): 40-44.
21. Amrita R. Bhadauria, Chella Hariharan. Clinical study of post operative wound infections in obstetrics and gynaecological surgeries in a tertiary care set up. *Int J Reprod Contracept Obstet Gynecol* 2013; 2(4): 631-638.