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The study of single dose antibiotic in caesarean section

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Abstract

Background: A very high usage of antibiotics have resulted in increase in incidence of antibiotic resistant micro-organisms, drug side effects and increased health care expenditure which is a bane in a resource limited setting and in poor or developing countries. These days, a long duration of antibiotic usage is characterized in Indian set up for prophylaxis during caesarean section. In the current study we evaluated single dose antibiotic use vs prolonged antibiotic use in subjects undergoing caesarean section.

Aims and Objectives: To compare single dose antibiotic use vs. multidose antibiotic use in subjects undergoing caesarean section.

Materials and Methods: The study included 100 patients at term, satisfying the inclusion and exclusion criteria, reporting to the labour room and undergoing caesarean section. The patients were divided into two groups of 50 subjects each. Patients in Group I was given a single dose of Inj. Cefotaxime 1gm IV and Inj. Metronidazole 500 mg IV infusion 30 minutes before the skin incision. Group II cases were given the first dose of Inj. cefotaxime and Inj. metronidazole before skin incision and was given oral antibiotics for 7 days. The cases were then monitored for surgical site infections, urine infections and any other febrile illness.

Results: There was similar incidence of surgical site infections, febrile illness up to 7 days post-operatively. The difference was non-significant (chi-square test; $P < 0.05$).

Conclusion: The study concluded that use of prolonged antibiotic course does not offer any advantage over single dose antibiotic prophylaxis.

Keywords: Caesarean section, antibiotic prophylaxis

Introduction

One of the main causes of maternal morbidity across the world is postpartum infection [1, 2]. Caesarean section is a major risk factor for postpartum infection with a possible 20-fold increase if compared with vaginal delivery [3]. Although general rules to prevent surgical infection, such as good surgical technique and antisepsis, are important, the use of antibiotic prophylaxis has been a major contributor in reducing the incidence of post-caesarean infection. It is said to have reduced the incidence by up to two-thirds [4, 5].

Literature quotes evidences that demonstrate the efficacy of prophylactic antibiotics in the reduction of rates of postpartum infection among patients who underwent caesarean section. [6] However there is a dilemma whether to use a single dose or multiple doses of antibiotic for prophylaxis for caesarean sections. We have decided to investigate the efficacy of the use of a single prophylactic intravenous dose of antibiotic vis a vis multiple doses in reducing post-operative infective morbidity in caesarean sections.

Materials and methods

100 patients undergoing Caesarean section were divided in to 2 groups of 50 patients each. Group-I received single dose of Inj. Cefotaxime 1gm IV and Inj. Metronidazole 500 mg IV infusion 30 minutes before the skin incision. Group II cases were given the first dose of Inj. cefotaxime and Inj. metronidazole before skin incision and was given oral antibiotics for 7 days.

Inclusion criteria

- 1) Patients above 18 years of age
- 2) Patients who had regular ANC check-ups
- 3) Patients willing to give a valid consent for participation in the study

Exclusion criteria

- 1) Patients with immunocompromised status
- 2) Unbooked case
- 3) Gestational diabetes mellitus
- 4) Prolonged labour
- 5) Obesity

Features of infection, urine routine, lochial discharge, breast tenderness/infection, caesarean scar, were evaluated till discharge and up to 7 days post operatively. Results were measured using chi-square test with a significant P value set at <0.05 at 95% confidence interval. The results were tabulated and charted for presentation.

Results**Table 1:** Age distribution

Age distribution	Group 1	Group 2	P value
18-22 years	20	19	0.837 (NS)
23-27 years	15	17	0.668 (NS)
28-32 years	15	14	0.822 (NS)

NS: Non-significant

Table 2: Incidence of febrile illness

	Incidence of fever	Percentage
Group I	6	12%
Group II	5	10%
P value	0.749 Non-significant	

Table 3: Surgical incision site infection

	Group I	Group II
Wound discharge & superficial dehiscence	5 (10%)	2 (4%)
P value	0.239 Non-significant	

Table 4: Urinary tract infection

	Incidence of UTI
Group I	1 (2%)
Group II	2 (4%)
P value	0.55 (Non-significant)

Discussion

As observed from the results, there was non-significant difference in age distribution of the patients. The minimum age in each group was 18 years and maximum age was 32 years. The incidence of febrile illness was 12% in Group I compared to 10% in Group II (Non-significant difference), Wound discharge & superficial dehiscence at surgical site was noted to be 10% in Group I and 4% in Group II (non-significant difference), Urinary tract infection was noted to be 2% and 4% respectively in Group I and Group II (non-significant difference).

Endometritis, wound infection, urinary tract infection, and mastitis are the four most common postpartum infections [7]. These infections complicate the postpartum period in up to 20% of all women [8]. A WHO recommendation (2015) on antibiotic use in elective and emergency caesarean section states that evidence suggests single dose of antibiotic is as effective as multiple doses and therefore single dose should be preferred [9]. Mugisa GA *et al.* [10] in 2018, noted that Single dose pre-operative antibiotic prophylactic with ceftriaxone and metronidazole is as effective as multiple doses in prevention of post-operative infectious morbidity in women who undergo elective caesarean section. Pinto-Lopes R *et al.* [11] in a meta-analysis conducted in 2017 noted that meta-analysis found

insufficient evidence to determine whether there is a difference between single dose and multiple dose regimens of antibiotic prophylaxis in reducing the incidence of infectious morbidity in women undergoing caesarean section. Despite not reaching statistical significance, a trend towards a lower incidence of urinary tract infection was observed with multiple dose regimens of antibiotic prophylaxis.

Our study was similar to other studies were no conclusive evidence of better prophylaxis with multiple doses of antibiotics in prophylaxis of infections was noted.

Limitations

- 1) The study was not blinded.
- 2) The role of confounding factors such as hygiene, hemoglobin levels, dietary factors, etc can impact post operative infections and were not quantified.
- 3) The study sample is small to extrapolate to regional and national level trends.
- 4) The patients were not followed up beyond 7 days post operatively.

Conclusion

As observed from our study, there were no statistically significant difference in incidence of post operative infections in women receiving either single dose of antibiotics compared to those receiving multiple antibiotic doses. In a resource limited setting such as India, it will be prudent to proceed with single dose antibiotic coverage in women undergoing caesarean sections. However, we suggest conducting similar studies with a higher patient sample size and a longer patient follow up for more conclusive results.

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