Research Article

A Prospective Observational Study on Drug Utilization Pattern of Antibiotics During Pregnanacy and Delivery in A Tertiary Care Teaching Hospital

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ABSTRACT

Drugs play a crucial role in promoting well-being of Human Health. Pregnancy is a special Physiological condition where drug treatment presents a special concern. Antibiotics are typically used to treat community borne infections in pregnancy and delivery women. A Prospective Observational study was conducted in Santhiram Medical college and General Hospital, Nandyal from July 2019 to December 2019 to determine the Drug Utilization pattern of Antibiotics During Pregnancy and Delivery. Where clinical data are collected by using case sheets to determine the utilization pattern of Antibiotics in patients who are admitted in inpatient wards and attending every month as outpatient for their regular checkup. A total of 150 patients were evaluated, about their utilization pattern of Antibiotics like Dosage, Safety, Frequency, and category of drugs under FDA classification. Where the utilization was categorized and classified into a rationalized prescription. There are many infections usually occurred during pregnancy and delivery period in that condition these antibiotics play an important role in preventing RTI and UTI and other prophylactic Bacterial infections. This study associates with Drug safety and therapeutic outcome of their age, sex and number of drugs per prescription. To lower the frequency of potential interactions it could be necessary to make a careful selection of therapeutic alternatives and this study is used to assess the reducing the risk of drug resistance, adverse effects and side effects where to improve the Drug safety and therapeutic outcome.

Keywords: Antibiotics, RTI, UTI, Pregnancy, Delivery, DUE.

INTRODUCTION

During pregnancy the use of antibiotics is a great concern of issue to the patients and prescribers alike and the state of pregnancy requires that all medications should be prescribed with specific caution[1]. Antibiotics are the more frequently prescribed type of Medication for prophylactic bacterial infections during pregnancy and Lactation. In now a day's one of the leading cause of Maternal mortality isInfections[2,3]. During pregnancy and delivery period antibiotics play a crucial role to reduce the maternal mortality. In Pregnant women there will be a more susceptibility of urinary tract infections (UTIs) due to physiological changes occurring in the body[4]. Where some Antibiotics are classified as safe to prescribe and use appropriately during pregnancy and after delivery for first 7 to 10 days. Increased uses of Antibiotics in pregnant women have been associated with asthma in early childhood[5]. Antibiotics are the most commonly used and misused of all drugs[6]. Mostly these antibiotics are used to treat community borne infections in pregnant and delivery women. There are several attempts to promote the rational use of antibiotics because of the risk of drug resistance, increased cost of healthcare, as well as the risk of teratogenicity in the developing foetus. If there is no certain dosage and frequency usage pattern of Antibiotics during Pregnancy for UTI infections it may leads to occur recurrently[7].The overuse of antibiotics during pregnancy lead to the risk of developing major congenital malformations[8]. The prophylactic use of antibiotics was widely recommended at caesarean section to reduce the incidence of wound infection, endometritis and serious maternal infection[9, 10]. The ultimate need of the study is to access Drug safety, utilization pattern and therapeutic outcome in a tertiary care teaching hospital.

METHODS AND MATERIALS

Study Design

It includes the patients, usage of antibiotics during pregnancy and delivery in OBG department of Santhiram medical college and general hospital at Nandyal, Kurnool District of Andhra Pradesh to study the Utilisation pattern and to educate the pregnant women in order to avoid unnecessary use of antibiotics by monitoring the perfect utilization pattern.

Study Period: 6 months.

Source of Data

- Prescriptions
- Case sheets

Methods of Collection of Data

- By reviewing prescriptions.
- By reviewing case sheets.

Study Population

All OPD patients from Inpatient and Outpatients units of OBG Department of Santhiram Medical College and General hospital in Nandyal.

Sample Size: 150

Sampling Criteria

Inclusion Criteria:

- Pregnant women at the age group of above 18 years.
- Pregnant and delivery women who are willing to participate in the study.

Exclusion criteria:

- Septic Abortions.
- Septic shock.
- Who are having endocrinological, cardiac, nephrology, lung disease containing women.
- Patients who provide incomplete information.
- Pregnant women who were not willing to co-operate with the study.

RESULTS AND DISCUSSION

This prospective observational study was conducted from July to December 2019 for a period of six months by considering both pregnant and delivery women in OBG department at a tertiary care teaching hospital, Nandyal.

In the present study there are about 150 women the maximum number i.e. 40 [26.6%] women with the age group of 23-24 years and the minimum number i.e. 3 [2%] women with the age group of 35-36 years were observed in both pregnancy and delivery. The mean average of delivery women 8.33±6.09 and the mean average of pregnant women 16.66 ± 12.71 were distributed according to their ages.

Table 1: Age wise distribution of women during Pregnancy and Delivery

Age in years	Delivery women	Pregnant women	Total	Percentage %
19-20	12	18	30	20 %
21-22	15	14	29	19.3 %
23-24	20	20	40	26.6%
25-26	8	10	18	12%
27-28	10	4	14	9.3 %
229-30	3	3	6	4%
31-32	2	3	5	3.3 %
33-34	3	2	5	3.3 %
35-36	2	1	3	2 %
Total	**75**	**75**	**150**	**100 %**
Mean ±SD	**8.33±6.09**	**8.33±6.94**	**16.66±12.71**	**-**

Table 2: Age wise Distribution of Women during pregnancy suffered from UTI and RTI

Age in years	UTI	RTI
19-20	11	7
21-22	9	5
23-24	12	8
25-26	5	5
27-28	2	1
29-30	2	2
31-32	1	2
33-34	1	1
35-36	0	1
Total	43	32
Percentage %	57.3%	42.6%

The number of women suffered from UTIs during pregnancy was 43 [57.3%] and RTIs was 32 [42.6%] which are distributed according to their ages.

Table 3: Age wise Distribution of Normal vaginal and caesarean delivery women

Age wise Distribution	Normal vaginal delivery	Caesarean delivery
19-20	5	7
21-22	9	6
23-24	9	11
25-26	3	5
27-28	2	8
29-30	1	2
31-32	1	1
33-34	1	2
35-36	-	2
Total	31	44
Percentage	41.33%	58.66%

The number of normal vaginal deliveries are 31[41.3%] and caesarean deliveries are 44[58.6%] which are distributed according to their ages.

Table 4: Classification of Antibiotics Utilized During Pregnancy and Delivery

Generic name	Group	Pregnancy Category	Oral dose	Iv dose
Amoxicillin +Clavulanic acid	Beta Lactam Antibiotics	B	625mg	1.2g
Ceftriaxone [iv] Cefpodoxime proxetil [oral]	Cephalosporin's	B	200mg	1.5g
Metronidazole	Antiprotozoals	B	400mg	100ml [5mg/ml]
Cefperazone +Sulbactum	Cephalosporins + Beta-lactam Enzyme inhibitors	B	200mg	1.5g
Nitrofurantoin	Urinary Antiseptics	C	100mg	-

Penicillins, Cephalosporins and antiprotozoals are safe to be used during third trimester of pregnancy and after delivery for the first 10 days which comes under the category of B drugs. Nitrofurantoin is a urinary antiseptic comes under category C drugs.

Table 5: Dosage form of Antibiotics during Pregnancy and Delivery

	Delivery women		Pregnant women
Drugs	**Iv and oral form**	**Only oral form**	**Only oral form**
Amoxicillin + clavulanic acid with Metronidazole	22	17	21
Ceftriaxone [iv] ; cefpodoxime proxetil [oral] with Metronidazole	21	14	31
Cefperazone +Sulbactam with Metronidazole	1	0	22
Nitrofurantoin	-	-	1
Total	**44**	**31**	**75**

The total numbers of delivery women are 75 in that 44 women are used to take both IV and oral form and 31 women are used to take only in oral form. The total number of pregnant women are75 and they are used to take only in oral form.

Table 6: Utilisation Pattern of Antibiotics in Delivery Women

Age in Years	No. of Delivery women	Amoxicillin + Clavulanic acid with Metronidazole	Ceftriaxone[iv], Cefpodoxime proxetil [oral]with Metronidazole	Cefperazone + Sulbactam with Metronidazole
19-20	12	6	6	-
21-22	15	8	7	-
23-24	20	15	5	-
25-26	8	4	4	-
27-28	10	3	6	1
29-30	3	2	1	-
31-32	2	-	2	-
33-34	3	1	2	-
35-36	2	-	2	-
Total	**75**	**39**	**35**	**1**
Percentage %	**100%**	**52%**	**46.6%**	**1.3%**

The women utilized Amoxicillin + Clavulanic acid with Metronidazole was 39 [52%], Ceftriaxone/Cefpodoxime proxetil with Metronidazole was 35 [46.6%], and Cefperazone + Sulbactam with Metronidazole was 1 [1.3%]

Table 7: Drug Utilisation Pattern of Antibiotics during Pregnancy for RTI AND UTI

Age in Years	Amoxicillin + Clavulanic acid		Cefpodoxime proxetil		Metronidazole		Nitrofurantoin	
	RTI	UTI	RTI	UTI	RTI	UTI	RTI	UTI
19-20	3	3	2	6	2	2	-	-
21-22	1	2	3	4	1	3	-	-
23-24	3	5	2	4	3	3	-	-
25-26	2	2	2	1	1	1	-	1
27-28	-	1	1	0	-	1	-	-
29-30	-	0	-	1	2	1	-	-
31-32	1	1	1	0	-	0	-	-
33-34	1	0	-	1	-	0	-	-
35-36	-	0	1	0	-	0	-	-
Total	**11**	**14**	**12**	**17**	**9**	**11**	**-**	**1**
Percentage%	**34.3%**	**32.5%**	**37.5%**	**39.5%**	**30%**	**25.5%**	**0**	**2.32%**

The women utilized Amoxicillin + Clavulanic acid during pregnancy for RTI was 11 [34.3%] and UTI 14 [32.5%], Cefpodoxime proxetil in RTI was 12 [37.5%] and UTI was 17[39.5%], Metronidazole in RTI 9 [30%] and UTI 11 [25.5%] and Nitrofurantoin was 1[2.32%].

Table 8: Treatment duration of Antibiotics during Pregnancy and Delivery

Duration of treatment [days]	Pregnant women	Delivery women	
		Normal vaginal Delivery	Caesarean Delivery
3 days	10 [13.3%]	4 [12.9%]	2 [4.5%]
5days	45 [60%]	20 [64.51%]	16 [36.3%]
7days	20 [26.6%]	7 [22.58%]	26 [59.0 9%]

In 60% of the pregnant women the duration of treatment was 5 days and in delivery women the 64.5% of the normal vaginal deliveries the duration of treatment was 5 days and 59% of the caesarean deliveries the duration of treatment was 7 days.

Utilization pattern of Antibiotics during Pregnancy and Delivery

In Pharmacoepidemiology drug utilization research is an essential part which describes its nature, extent and determinants of drug exposure[11, 12]. DUE programs can directly improve the quality of care for patients individually and as populations by preventing the use of unnecessary or inappropriate drug therapy and adverse drug reactions[13]. To achieve better patient care there is a need to monitor, evaluate and analyse the utilization pattern of antibiotics. Such analysis will not only improve the standards of medical treatment at all levels in health system, but also helps in identification of problems related to drug use such as poly pharmacy, Drug-Drug interactions and Adverse Drug Reactions**.**

In this study, we have collected 150 cases based on utilisation pattern of antibiotics from 75 pregnant women and 75 Delivery women from OBG department in a tertiary care teaching Hospital. We compared these antibiotics as per age wise distribution, preference of drug utilisation, dosage form, duration and Frequency.

With the help of the collected data from outpatient and inpatient case sheets the utilization pattern of antibiotics like Amoxicillin + Clavulanic acid 625mg in oral form/ 1.2 gm in i.v form twice a day, with metronidazole 400 mg thrice a day or Ceftriaxone 1.2 gm i.v /Cefpodoxime proxetil 200 mg oral form twice a day with Metronidazole 400mg thrice a day for treating prophylactic bacterial infections in delivery women. We did not observe any adverse effects or side effects, during the seven days of treatment by this utilisation pattern of antibiotics. During pregnancy the utilisation pattern of antibiotics like Cefpodoxime proxetil 200 mg orally twice a day, Amoxicillin + clavulanic acid 625 mg orally twice a day and Metronidazole 400 mg orally thrice a day was used to treat respiratory & urinary tract infections. Therefore, periodic evaluation of drug utilization patterns needs to be done to enable suitable modifications in prescription of drugs to increase the therapeutic benefit and decrease the adverse effects.

Underlying disease and rationality for Antibiotic usage during Pregnancy and Delivery

Respiratory and urinary tract infections are the most frequently recorded indications for antibiotic prescribing both before and during pregnancy [Petersen et al]. Antibiotics like Penicillin's and Cephalosporins have been considered to be safe for Pregnant and delivery mothers. Cephalosporins have not been associated with birth defects[32]. Published studies carried that urinary and respiratory tract infections are the most commonly observed infectious diseases during pregnancy. Prophylactic therapies of antibiotics have been recommended for recurrent Urinary tract infections in pregnant women[27-29]. UTIs are mostly associated with changes in the urinary tract and blockade of the bladder due to this the bladder was resting on the uterus which leads to infections[14,15]. Respiratory changes that occur during pregnancy is essential, in that conditions therapy must be provided[16-20].

Status of Antibiotics utilization during Pregnancy and Delivery

In the present study, the number of women suffered from UTIs was 43 and RTIs was 32 to treat them here the antibiotics like Amoxicillin + Clavulanic acid 625 mg orally twice a day, cefpodoxime proxetil 200mg orally twice a day, and Metronidazole 400mg orally thrice a day was preferred. During pregnancy for certain infectious diseases mostly antibiotic monotherapy was recommended. The most commonly utilized drug for UTIs and RTIs in this study was cefpodoxime proxetil for 5-7 days.

The utilisation pattern was different in delivery women compared to the pregnant women. In Caesarean delivery two antibiotics was utilized by each and every women for 7 days in that 3 days parenteral form and remaining 4 days are oral form. Where as in vaginal delivery the antibiotics utilized for 5 – 7 days. The duration of therapy depends primarily on the nature of organisms involved, severity, presentation, Trimesters of pregnancy and prophylactic bacterial infections in delivery and it is an evidence-based medicine information or experts opinion[21-26].

Antibiotic prophylaxis for Delivery women

There are multiple regimens for prophylactic antibiotic administration in women undergoing caesarean delivery. The use of antibiotic prophylaxis for CD has been shown to be effective in reducing postoperative morbidity, cost and duration of hospitalization.

For vaginal delivery women the prophylactic antibiotics are recommended to reduce the rates of sepsis and infections.

In a similar study, WHO and Cochrane review found that evidence is needed in relation to operative vaginal delivery and the use of prophylactic antibiotics to reduce rates of sepsis and infection[30, 31].

CONCLUSION

From this study, we can conclude that perfect usage pattern of antibiotics with doses and frequency can avoid the unnecessary use, reducing the risk of drug resistance, adverse effects and side effects and therefore we can reach Safety, efficacy and Rational use of Antibiotics.

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