

Prescribing in Pregnancy

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Objective: To assess the prescribing patterns and clinical practices in the use of pharmaceutical agents in pregnancy **Study Design:** Observational, Cross-sectional study. **Study Period:** March 2002 to March 2003 **Setting:** Study was conducted at antenatal clinic, Jinnah Hospital, Lahore. **Materials and Methods:** 250 patients from antenatal clinic were interviewed to collect information regarding age, parity, gestational age, any medication, its indication, route, duration and prescriber during current pregnancy on a pre-designed proforma. **Sampling Method:** Patients were enrolled in this study on first come and enroll basis. **Results:** Most of the women (90%) visiting the antenatal clinic were in the age group 21–30 years. 94% of the women were taking medications and the prescriptions included haematinics (88%), folic acid (61%), calcium supplements (63%), antibiotics (22%), anti-fungals (19%), antiemetics (8%) and laxatives (6%). 6% of women were not taking any medication. Commonest prescribers were general practitioners (46%). Rest of the prescribers were medical officers at antenatal clinic (28%), LHV's/nurses (11%) and specialists (9%). Self-medication was seen in 6%. 47% of the women taking self-medications were among the educated group (Matric and above) and 53% of the women were among the uneducated group ($P < 0.001$). 28% took treatment from general practitioners and lady health visitors without any certain diagnosis, on symptomatic grounds. **Conclusion:** The use of drugs in pregnancy is substantial and varied. Information on the use of drugs during pregnancy is scarce and anecdotal. Careful consideration of the benefits to the mother and risks to the fetus is required, when prescribing drugs during pregnancy. All prescriptions or drugs recommended in pregnancy must have solid evidence derived from current literature.

Key Word: Drugs, Pregnancy, Prescriptions, antenatal

Pregnancy is a time of profound physiological change in a women's body. Affecting almost every organ system. These unique changes challenge clinicians managing disease states during pregnancy and affect the selection of medications. Drug therapy may need to be adjusted due to the unique pharmacokinetics of pregnancy as well as to account for teratogenic concerns¹.

Thalidomide, a drug prescribed to women during 1960s as an anti-anxiety medication led to the birth of thousands of grossly malformed infants². This catastrophe still makes clinician uneasy whenever they are faced with prescribing a new medication to a pregnant woman. In the case of thalidomide, it took several years before the causal effect was actually realized. In the US, this led to the creation of drug regulations, designed to help endure the safe use of prescribed medications.

When considering drug therapy in pregnancy, the risk of treatment for the fetus has to be weighed against the risk to the mother and the child of carrying out no treatment. However, carefully selected drugs and closed meshed monitoring may even decrease the risk for the child³.

Throughout pregnancy drugs may affect fetal growth and functional development. Teratogenic risk to the fetus is highest in the 1st trimester, as it is the period of organogenesis. Exposure to teratogens can expose a developing fetus to major congenital malformations. All orally administered medication enter the fetal circulation and therefore no medication should be considered completely safe. Ethical consideration makes prospective placebo-controlled, double-blinded studies impossible, so most information that has been gathered about the effects

of medications and other therapeutics on a fetus has been collected retrospectively⁴.

Each year, almost four million women in the US give birth and nearly 15% of these women have used a legal drug, either prescription or non-prescription, within 6 months of conception. An astonishing 75% of these women were using 3-10 drugs⁵. Nearly 62% of all pregnant women received at least one drug, 25% took an opiate and 13% took a psychotropic.

Drug therapy is a highly specialized field. In pregnancy even an educated woman is dependant on the advice of a health care provider⁶. The most frequent medical intervention performed by a doctor is writing of a prescription and he or she has the freedom to prescribe whatever drugs they deem necessary^{7,8}.

The healthcare cost in the general and drug cost in particular arising every where and most of the increased cost of drugs throughout the world is due to use of new medicines⁹ and Pakistan is no exception. Although new is not necessary, better. Many clinicians continue to prescribe the new and the more expensive drugs as first line therapy¹⁰. Scarce financial resources are spent on unnecessary nutritional supplements mostly by prescribing vitamin preparations and nearly half of prescribed medicines in pregnancy are tonics and antacids. Laxatives, antibiotics, analgesics and anti-emetics are second in this list. Routine addition of multivitamin in prescription contributes to polypharmacy¹¹ as well as to raising the cost of prescribed drugs¹². This study was design to assess the prescribing practices and prescribers during pregnancy and to evaluate the implementation of such practices.

Results:

The age and parity of study group is as in table I. The educational and social status is as in table II. Most of the women (90%) visiting the antenatal clinics were in the age group 21-30 years. The prescriptions included haematinics (88%), folic acid (61%), calcium supplements (63%), antibiotics (22%), anti-fungals (19%), antiemetics (8%) and laxatives (6%). 6% of women were not taking any medication. The supplements used are as in table III. Commonest prescribers were general practitioners (56%). Rest of the prescribers were medical officers at antenatal clinic (32%), LHV's/nurses (19%) and specialists (9%). Self-medication was seen in 6%. 47% of the women taking self-medications were among the educated group (Matric and above) and 53% of the women were among the uneducated group ($P < 0.001$). 28% took treatment from general practitioners and lady health visitors without any certain diagnosis on symptomatic grounds.

Among 250 patients, 220 (88%) took elemental iron mainly in a dose of 50-100mg/day (178 patients, 71.2%) 24 patients (9.6%) took iron in <50mg/day and only 18 patients (7.2%) took iron in therapeutic doses that is >100mg/day. 11 patients (4.4%) took injectable iron because of poor compliance. Calcium, folic acid and multivitamins containing high potency B-complex were taken by 158 patients (63.2%), 153 patients (61.2%) and 144 patients (57.6%) respectively.

The injectables used in pregnancy are as in table IV. Oral and injectable antibiotics mainly in penicillin group (29 patients, 11.6%) were employed. Oral antibiotics prescribed in pregnancy are as in table V.

Discussion:

Maternal and fetal effects of most therapeutic agents are unknown for about one half of medications. However, the majority of pregnant women (40% to 90%) are exposed to medications during pregnancy. These include a variety of agents: Vitamins, minerals, antibiotics, laxatives, antiemetics, sedatives, antacids and antihistamines^{13,14}. Many medications are taken without physicians' advice or before recognition of pregnancy¹⁵.

The incidence of medication use during pregnancy is high. Of over 250 pregnant women surveyed, approximately 94% took medication prescribed by a health care provider. Results of the study showed that pregnant women were prescribed by general practitioners (56%), medical officers of a teaching (Jinnah) hospital (32%), specialists (9.2%), nurses/ LHV's (19.2%). It was also seen that a small but significant (6%) proportion took drugs without medical advice. This is a worrying trend as these patients also have a tendency to hide this fact for the fear of rebuke. This may signify a higher proportion of such practices without the medical rationale and advice. Physicians must discuss use of drugs and its dangers with their patients to dispel such practices. At the same time in a largely anaemic population like that of Pakistan a similar figure (6% of the study group) were not taking any

medicine. This means either lack, inability or refusal to follow medical advice regarding haematinics. In a 1987 survey of nearly 500 pregnant women 10% of them reported that they took neither prescriptions or over the counter drugs. The incidence of medication used during pregnancy seems considerably lower in United Kingdom compared to that in the United States. In one report, fewer than 10% of pregnant women in the United Kingdom took medication other than Prenatal Vitamins and iron supplements during first trimester¹⁶. However, this showed a high rate of drugs taken by antenatal pregnant women. 88% took haematinics, 63% took calcium supplements 61% folic acid. 22% took various types of antibiotics, 18.8% received analgesics 8% antiemetics and 6% laxatives. 6% received no treatments and there were self-medications in 6%.

All the drugs are chemical poisons and they must be used with utmost care in pregnancy. The irrational use of drugs by both prescriber and consumer is in fact a global problem, which can be assessed by a standardized method of prescription analysis. For this purpose WHO have recommended minimum five core indicators, which can give an idea about the quality of a prescription and provide uniform parameters for comparative analysis of prescriptions collected from various health care facilities/countries. These parameters include the number of drugs per-prescription and percentage of generic drugs, antibiotics, injections and drugs from national essential drug list in a total analyzed prescriptions¹⁷.

Infection occurs commonly during pregnancy and it may be necessary to prescribe antimicrobial agents. Antibacterial are among the most frequently prescribed medications during pregnancy. Most of these drugs are safe for use during pregnancy. Antibiotic may be associated with adverse fetal effects. All the penicillins are apparently safe for use during pregnancy in patients not allergic to these drugs. More recently developed broad spectrum penicillins and those combined with the beta lactamase inhibitors such as clavulanic acids and salbactam have not been adequately studied during pregnancy. However a significant risk for adverse effects seems unlikely. All the penicillins cross the placenta resulting in significant fetal levels¹⁸. Thus the penicillins are the drug of choice in pregnancy. All cephalosporins cross the placenta to a similar degree resulting in significant levels. Erythromycin, a macrolide antibiotic is not associated with adverse fetal outcome or congenital anomalies. This agent does not cross placenta in appreciable quantity¹⁹. All aminoglycosides cross the placenta to the same degree^{20,21} and result in significant fetal levels. A drug in this class streptomycin has been reported to be associated with 8th cranial nerve damage in fetuses whose mother received it for a significant time during pregnancy^{22,23}. Nitrofurantoin is another agent used to treat urinary tract infections during pregnancy. This drug was not associated with an increase risk of congenital

anomalies in one study and there were no reports of adverse effects following its use during pregnancy²⁴. The flouroquinolones are relatively new antibiotics frequently used to treat U.T.I. There are no studies of congenital anomalies in infants whose mothers took these drugs during pregnancy. In this study 2.2% of pregnant women took various type of antibiotics. Among them most common was ampicillin. 19.2% used local antifungal. Most of the patients took antibiotics for urinary tract infection (35%) and upper respiratory tract infection (21%).

Analgesics are the medication most commonly prescribed to the pregnant women. With few exceptions most analgesics can be administered to pregnant women with relative safety. In this study 18.8% of pregnant women took analgesics on symptomatic grounds. Most of these prescriptions were prescribed by paramedical staff including nurses, lady health visitors and also by self-medication.

Drugs taken by pregnant women could have profound effect on pregnancy outcome for both the mother and the fetus. In developing countries like Pakistan drug regulation

is poor, access is unrestricted and abuse of drugs especially antibiotics is rampant. This study was undertaken to determine the pattern and extent of drug consumption amongst pregnant women at Jinnah Hospital Lahore. Of the 250 patients interviewed 94% took at least one drug during pregnancy. Many of them used a median # of 2 to 3 drugs, Iron (88%), Folic acid (61%), and calcium (63%). Similar result was collected from a study, which was conducted on Italian women. Iron deficiency anemia is common among pregnant women in developing countries. So this high rate of supplement therapy is cost effective in Pakistan.

Our present study, when compared with similar studies previously conducted by others confirms that variations in prescribing practices do exist in different areas of the world. Measures should be taken to make prescriber cost conscious through continued unbiased educational programs as the educational interventions have been shown to be effective in favorable in changing the patterns of drug prescriptions..

Table I Age and parity Distribution

Age in years	Parity		
	Primigravida	Multigravida	GrandMultigravida
< 20	2 (0.8%)	-	-
21-30	82 (32.8%)	138 (55.2%)	2 (0.8%)
31-40	1 (0.4%)	20 (8.0%)	4 (1.6%)
> 40	-	-	1 (0.4%)

Table II Education and Social Status of Subjects

Education	Social Status		
	Lower Class	Middle Class	Upper Class
Uneducated	94 (37.6%)	-	-
Primary	26 (10.4%)	12 (04.8%)	-
Matric	13 (05.2%)	67 (26.8%)	-
Graduation	-	32 (12.8%)	-
Higher	-	06 (02.4%)	-

Table III Supplements Distribution

Haematinics (mg/day)			Multivitamins			Calcium
<50	50-100	>10	Folic Acid	High potency B- complex	Fat Soluble Vitamins	
24 (9.6%)	178 (71.%)	18(7.2%)	153(61%)	144(57.6%)	86(34%)	158(63%)

Table IV Injectables Used in Pregnancy

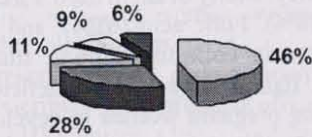
Injectable Iron	I/V Fluids	Anti-emetics	Injectable Antibiotics	Tetanus toxoid
11(4.4%)	04(1.6%)	01(0.4%)	01(0.4%)	84 33.6%)

Table V Oral antibiotics used in pregnancy

Penicillins	Cephalosporins	Macrolides	Tetra-cyclines	Quinolones	Sulfon-amides
29 (11.6%)	06(2.4%)	07(2.8%)	-	12(4.8%)	-

Figure 1 Prescribers in the Study

□ General Practitioner ■ Medical Officers
 □ LHV/Nurses □ Specialists
 ■ Self Medication



Conclusion:

Information on the use of drugs during pregnancy is scarce and anecdotal. Careful consideration of the benefits to the mother and risks to the fetus is required, when prescribing drugs during pregnancy. All prescriptions or drugs recommended in pregnancy must have solid evidence derived from current literature.

It is a major clinical and Public health problem that there is no clear strategy as to how we can make the best use of information obtained when pregnant women use drugs. For this reason, some pregnant women are not treated as they should be and some are given drugs they should not use. So

- Drugs should be prescribed for a pregnant woman only when the indications are clear and specific, and the expected benefit to the mother is greater than the risk to the fetus.
- If possible avoid all drugs in the first trimester.
- Prescribe drugs that have been well tried in pregnancy in preference to newer preparations.

Use the smallest effective dose for the shortest therapeutic time

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