

Assessment of adherence to medication during chronic illnesses in pregnancy

Smita Sontakke, Vrushali Takalikal¹, Jitendra Deshmukh², Vijay M. Motghare, Mrunalini Kalikar, Avinash Turankar

Department of Pharmacology, GMC, Nagpur, ¹Department of Paediatrics, Seth G.S. Medical College and KEM Hospital, Mumbai, ²Department of Obstetrics and Gynaecology, GMC, Gondia, Maharashtra, India

Abstract

Purpose/Aim: To evaluate adherence to medication in chronic illnesses during pregnancy and to identify factors responsible for non-adherence.

Methods: This was a prospective, cross-sectional, questionnaire based study initiated after approval of the institutional ethics committee. Pregnant women suffering from any chronic illness (except HIV) were questioned to evaluate adherence to medication in chronic illnesses during pregnancy and to detect factors responsible for non-adherence using a semi-structured, open-ended questionnaire. Adherence to medication was also assessed using 4-item Morisky's medication adherence scale.

Results: Rate of high adherence was significantly more (58.77%) with medications for chronic illness compared to medications for normal pregnancy (15.78%). Majority of women were more concerned about the chronic illness and believed that keeping the chronic illness under control is more important for normal growth of the baby. Unawareness about usefulness of each medicine and forgetfulness were the most common reasons for non-adherence to medications. Not taking prescribed dose was the most common type of non-adherence. Level of adherence positively correlated with level of education while it was inversely related to number of tablets per day.

Conclusion: Higher adherence to medications for chronic illnesses during pregnancy is an encouraging finding but at the same time poor adherence to medications for normal pregnancy is a matter of concern. Most of the issues responsible for non-adherence to medication as reported in this study can be resolved to a significant extent by planning and implementing interventions aimed at improving adherence to treatment during pregnancy in which health professionals play a major role.

Keywords: Cross-sectional study, morisky medication adherence scale-4, medications for normal pregnancy

Address for correspondence: Dr. Smita Sontakke, 502, Silver Palms Lpot No. Q-9 RPTS Road, Laxminagar, Nagpur - 440 022, Maharashtra, India.
E-mail: smitaavanti@yahoo.co.in

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INTRODUCTION

The World Health Organization defines adherence, a term which is often used interchangeably with compliance, as the extent to which a person's behavior: taking medication,

following a diet, and/or executing lifestyle changes, corresponds with agreed recommendations from a health-care provider.^[1] Adherence to medication is of particular concern with chronic conditions as therapy is often long term, and

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patients without symptoms need to take medication to prevent later complications without any immediate benefits noted.^[2] Nonadherence with medication regimens is not uncommon which may result in negative consequences including failure to achieve the desired treatment goal.

Adherence to medication during pregnancy is particularly important as not only maternal health but fetal well-being also needs to be considered. There is a general belief in the society that all kinds of medications are harmful to the fetus. This very commonly leads to nonadherence to medication in pregnancy. Earlier studies on adherence to medication in pregnancy have mainly focused either on iron, folic acid, and vitamin supplements or antiretroviral medications.^[3,4]

Apart from HIV adherence to medication in other chronic illnesses during pregnancy has not been extensively studied, and there are only isolated reports in other medical conditions. In a study in 210 pregnant women who reported chronic medication use during pregnancy, an overall 36.2% had low medication adherence. Maximum rates of low adherence were reported for rheumatic disorders (55.6%) followed by epilepsy (40%). Individual pregnancy-specific beliefs about medication was a significant determinant of low medication adherence during pregnancy.^[5] In another study, out of the total participants interviewed, 39.3% reported a chronic health condition during pregnancy, nonadherence to medication was reported by 59.1% participants, mainly because of forgetting (43.6%).^[6] Poor adherence to medication in chronic illnesses during pregnancy may not only adversely affect maternal health but may also jeopardize fetal growth and development.

A few studies have reported drug utilization pattern in pregnant women in India, but the issue of adherence to drug therapy in chronic diseases in pregnancy has not been addressed.^[7,8] Unlike Western countries, the spectrum of chronic illnesses found associated with pregnancy in India is different. Conditions such as hypothyroidism, pregnancy-induced hypertension, anemia, sickle-cell disease, and gestational diabetes mellitus are more common. Adherence to medication in pregnancy is also likely to be comprised by factors such as poor educational status, poor socioeconomic status, early marriages and cultural factors including advice from family members, etc., Hence, this study was planned with the objectives of evaluating adherence to medication in chronic illnesses during pregnancy and to detect factors responsible for nonadherence.

METHODOLOGY

This was a prospective, cross-sectional, questionnaire-based study initiated after approval of the Institutional Ethics

Committee. The study was carried out in a single center in the Department of Obstetrics and Gynaecology, Outpatient and Inpatient, of a tertiary care teaching hospital.

Study population

Patients admitted in obstetrics wards and those attending the antenatal care (ANC) clinic. Inclusion criteria were pregnant women suffering from any chronic illness, gestational age more than 12 weeks and age >18 years. Women with HIV-positive status as per available medical records were excluded from the study.

Patients meeting the selection criteria were briefed about the study and written informed consent was obtained from those willing to participate. Patient information sheet in vernacular language was provided. The study patients were interviewed by one of the co-investigators through a direct face-to-face interview, their prescriptions analyzed and the information entered in a self-developed, semi-structured, open-ended questionnaire to get the following details: demographic characteristics, diagnosis, medication details (medicines prescribed, dose/strength, frequency of administration, and duration), any precautions/instructions about medicine use, adherence to medication, reasons for nonadherence, use of alternative medicines, awareness about disease, importance of using medications, and importance of adherence to medication.

The questionnaire was pretested in five patients and suitable modifications done. The final questionnaire and its translated version in vernacular language were approved by the Institutional Ethics Committee. In addition, adherence to therapy was also assessed using the 4-item Morisky Medication Adherence Scale (MMAS-4), in which higher score indicates poor adherence. Outpatients were approached while they were waiting for the doctor's consultation so that they did not need to spend additional time for this purpose. Using the MMAS-4 level of adherence was assessed separately for medication for normal pregnancy (iron, folic acid, and calcium supplements) and medication for chronic illness. The data obtained were compiled and analyzed.

Statistical analysis

Descriptive statistics are tabulated as counts and percentages for categorical variables. Numerical continuous variables, for example, age and number of drugs prescribed per day, are expressed as mean \pm standard deviation (SD). Fisher's exact test was used to compare difference in the level of adherence to medications for normal pregnancy and medications for chronic illness. Pearson correlation test was used to find correlation between medication adherence score and age, level of education, financial status, parity (primi/multi), and number of tablets per day. Graph pad

Table 1: Awareness about different issues related to the use of medicines in pregnancy (n=114)

Statements	Number of patients	
	Yes, n (%)	No, n (%)
Strictly follow your medication schedule as prescribed by your doctor	40 (35.08)	74 (64.92)
Aware of the names of the medicines prescribed	114 (100)	Nil (0)
Aware of dose of the medicines prescribed	40 (35.08)	74 (64.92)
Aware of the frequency of administration of medication for normal pregnancy	32 (28.1)	82 (71.9)
Aware of the frequency of administration of medication for chronic illness	111 (97.3)	3 (2.7)
Aware of the duration of administration	27 (23.68)	87 (76.32)
Aware of which medicines are prescribed for normal pregnancy and which for the chronic illness	101 (88.59)	13 (11.41)
Aware of the usefulness of each medicine	54 (47.36)	60 (52.64)
Stopped taking any medicines that were prescribed	24 (21.05)	90 (78.95)
Take any medicines for any acute illnesses in pregnancy	29 (25.44)	85 (74.56)
Regularly follow your visits to the ANC clinic	106 (92.98)	8 (7.02)

Figures in parentheses indicate the percentage of patients. ANC: Antenatal care

prism version 6.0 (GraphPad software Inc., California, USA) was used for statistical analysis.

RESULTS

This study was carried out in 114 pregnant women either admitted in obstetrics wards or attending the ANC clinic of a tertiary care teaching hospital. The mean age of the patients was 26.15 ± 4.097 years. Majority of the patients (76.3%) were in the age group of 20–30 years (range: 20–37 years). None of the patients was illiterate. The percentage of patients having postgraduate degree was 11.41%, 20.17% were graduates, while 68.42% were below graduate. Average number of medicines prescribed was 3.219 ± 0.508 (mean \pm SD) tablets/day.

Table 1 shows that only 35.08% of patients strictly followed the medication schedule as prescribed by their doctor. Majority of patients (88.59%) were aware of which medicines were prescribed for normal pregnancy and which were for chronic illness. Awareness about the frequency of administration of medications for chronic illness was statistically significantly higher compared to the same for normal pregnancy. ($P < 0.0001$, Fisher's exact test).

Majority of the patients took iron, folic acid, and calcium supplements as per their own convenience, once-daily is the most commonly followed practice.

Out of the 74 women who did not strictly follow the medication schedule as prescribed by the doctor, 56 women preferred medications for chronic illness over medications for normal pregnancy. The reason for thinking so as told by all of them was that keeping the chronic illness under control is important for the normal growth of the baby. None of the women showing nonadherence to medication reported about the same to the treating doctor. Major reasons for not reporting nonadherence to medication to the doctor were that they felt embarrassed to do so or they did not feel the

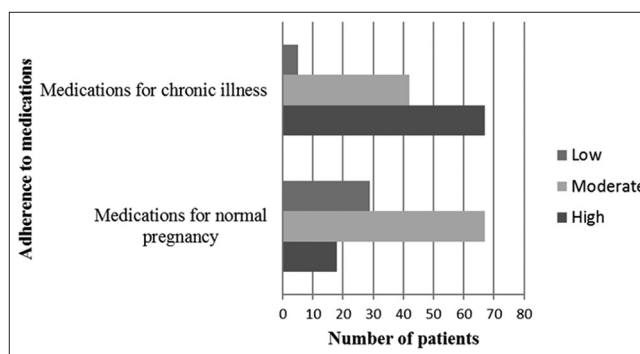


Figure 1: Adherence to medications in pregnancy using 4-item Morisky medication adherence scale (n = 114)

need to do so. Coexisting diseases and the number of patients suffering from them was as follows: hypothyroidism (51), pregnancy-induced hypertension (19), rheumatic heart disease (11), sickle cell disease (11), epilepsy (09), gestational diabetes mellitus (05), preexisting diabetes (05), hyperemesis gravidarum (03), and psoriasis (02).

Figure 1 shows that the number of patients (67) showing high adherence to medications for chronic illness was statistically significantly more than the number of patients (19) showing high adherence to medications for normal pregnancy ($P < 0.0001$).

Types of nonadherence to medication and number of patients reporting the same were as follows: do not take medication for required duration (13), do not take the dose prescribed (6), do not take all medicines prescribed (9), do not buy all medicines in the prescription (15).

Figure 2 shows that unawareness of the usefulness of each medicine and forgetfulness were the major reasons for not following medication schedule.

Figure 3 shows that high adherence to medication was maximum in patients of hypothyroidism (68.6%) followed by diabetes mellitus (54.5%).

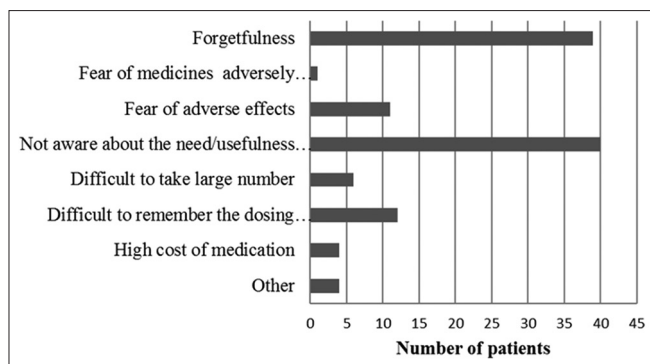


Figure 2: Reasons for nonadherence to medication schedule (n=74). Other includes: feeling nauseating on taking the medications, difficult to swallow calcium tablets because of large size

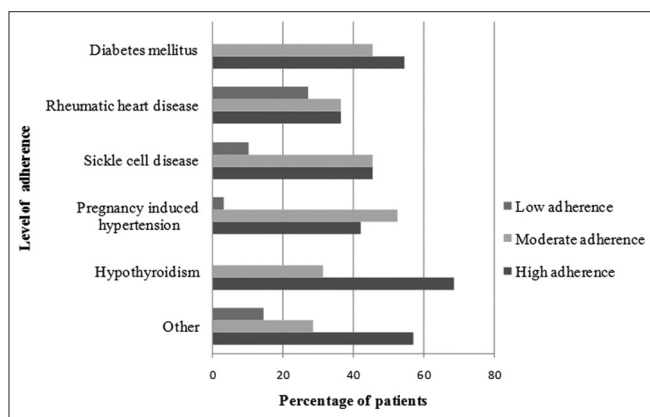


Figure 3: Disease-specific adherence to medications. Other includes: hepatitis B, psoriasis, hyperemesis gravidarum, epilepsy

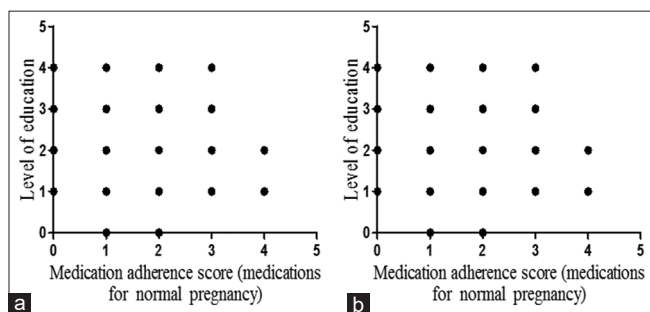


Figure 4: (a) Correlation between medication adherence score (medications for normal pregnancy) and level of education. (b) Correlation between medication adherence score (medications for chronic illness) and level of education

A significant negative correlation was observed between level of education and adherence score, for both, medications for normal pregnancy (Pearson r : -0.205 , $P < 0.0294$), and medications for chronic illness (Pearson r : -0.2237 , $P < 0.0167$) indicating that adherence to medications was positively correlated with level of education, as adherence score is inversely related to level of adherence in the MMAS-4 [Figure 4a and b]. Significant positive correlation was observed between adherence score for medications for chronic illness and the number of

tablets/day (Pearson r : 0.246 , $P = 0.0096$) indicating that more the number of tablets to be taken per day poorer is the adherence. No correlation was observed between level of adherence and age, financial status, and parity (primi/multi).

DISCUSSION

This study evaluated adherence to medication in pregnant women suffering from any chronic illness except HIV. Self-reported rate of nonadherence to medication was 64.92%. Approximately similar rates of self-reported nonadherence to medications in pregnancy have been reported (48.8%–59.1%).^[6,9] The level of adherence was assessed separately for medications for normal pregnancy and medications for chronic illness using MMAS-4. The rate of high adherence was significantly more (58.77%) with medications for chronic illness compared to medications for normal pregnancy (15.78%). Almost all the women were aware of frequency of administration of medications for chronic illness but not about iron, folic acid, and calcium supplements. This indicates that women are more concerned about chronic illness, which also reflects in the reason given by majority of them that keeping the chronic illness under control is important for normal growth of the baby. We did not come across any published studies that compared adherence to medications for normal pregnancy with adherence to medications for chronic illness in the same patients. High adherence to medications for chronic illness is an encouraging finding, but at the same time, lack of awareness and inadequate adherence to medications for normal pregnancy is a matter of concern that needs to be addressed seriously. This indicates that women need to be made aware that iron, folic acid, and calcium supplements are as important for fetal growth and development as are medications for chronic illness.

Hypothyroidism was the most common chronic illness observed in the study population (44.73%). None of the patients of hypothyroidism and diabetes mellitus reported low adherence to medication for chronic illness while low level of adherence was maximum in patients of rheumatic heart disease (27.2%). Although widely different rates of adherence to medication in pregnancy have been reported in different studies, the rate of low adherence was highest (55.6%) for medication for rheumatic disorders, and it was lowest for diabetes and hypothyroidism (17.1% and 17%, respectively).^[5,10] Although it is difficult to comment on the cause of such wide variation in rates of adherence reported in different studies one of the reasons may be the inconsistency in uniform definition of nonadherence.^[11] Further, it is also known that patients

are known to underreport nonadherence^[12] or to report adherence according to personal definitions rather than conventional medical concepts of nonadherence,^[13] which may also be responsible for huge variations in rates of adherence reported in different studies.

The most common type of nonadherence was not taking the prescribed dose, and this was particularly applicable to iron, folic acid, and calcium supplements. As has been mentioned earlier majority of the women were more concerned about medications for chronic illness for which they followed the medication schedule while they considered medications for normal pregnancy less important; hence, were not serious about adhering to the dosing instructions including frequency of administration. The most common reasons for nonadherence to medications were unawareness about usefulness of each medicine and forgetfulness. Forgetfulness as a cause of nonadherence to medication is also reported in another study.^[14] Surprisingly, in this study, only one patient was concerned about drugs causing adverse effects on the fetus while majority of the patients believed that all drugs prescribed by their doctor are safe during pregnancy. This finding that women had faith in their doctor is promising, but nonadherence due to unawareness of usefulness of medicines is a problem which needs to be considered seriously, and measures to overcome this need to be undertaken on priority. In contrast to the finding in this study, fear of drugs adversely affecting the baby is one of the common causes of nonadherence to medication in pregnancy reported in other studies.^[12] It has also been shown that pregnant women overestimated the teratogenic risk associated with many drugs during pregnancy.^[15] Other common reason for nonadherence reported was difficult to remember due to complex dosing schedules. Nonadherence to medication due to complex dosing schedule is reported not only during pregnancy but also in other chronic illnesses where long-term treatment is needed.^[16] Hence, complex dosing schedule can be considered a significant predictor of nonadherence to medication and indicates that simplifying the treatment regime would help to a great extent in improving medication adherence. The number of drugs prescribed was inversely correlated to level of adherence. Reducing the number of drugs by prescribing rational fixed-dose combinations wherever possible can be tried. This is not always possible; hence, more important is emphasizing on the patient the importance of taking each medicine. Another issue of concern reported in this study was that patients did not inform about medication nonadherence to their health-care professional. The reasons for not doing so were, they felt embarrassing to do so or they did not feel the need to do so. Not informing

health-care professionals about medication nonadherence is particularly alarming because health-care professionals can play a role in improving medication adherence only if they are aware about the problem. This problem can be resolved to a certain extent if health-care professionals play a proactive role in promoting adherence to medication and assisting women to avoid potential fetal harm because of nonadherence.^[6] Level of adherence was positively correlated with educational status. This is not surprising as it is a well-established fact that education, in general, improves awareness about everything. The same has been reported in various studies wherein educational status was found to be significantly associated with adherence to medication in pregnant women.^[3,17]

CONCLUSION

To conclude, poor patient adherence to treatment regimens is a serious matter, particularly during pregnancy. Higher adherence to medications for chronic illnesses during pregnancy is an encouraging finding, but at the same time, inadequate adherence to medications for normal pregnancy is a matter of concern. Most of the issues responsible for nonadherence to medication as reported in this study can be resolved to a significant extent by planning and implementing interventions aimed at improving adherence to treatment during pregnancy, in which health-care professionals play a major role. This would help in improving the overall outcome of pregnancy.

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Conflicts of interest

There are no conflicts of interest.

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