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FACTORS ASSOCIATED WITH ADHERENCE TO ANTIRETROVIRAL THERAPY (ART) AMONG PREGNANT WOMEN IN UYO, AKWA IBOM STATE

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ABSTRACT

Human Immuno-Deficiency Virus (HIV) is a major deadly disease, that affects millions of people worldwide, and adherence to Antiretroviral Therapy (ART) is therefore crucial for effective treatment, but can be quite complex. This study is aimed to determine the factors associated with adherence during pregnancy. This is a cross sectional study utilizing a semi structured questionnaire. Chi-square (χ^2) analysis was used to determine factors associated with good drug adherence during pregnancy. Precisely 82 (80.4%) of the interviewed 102 women achieved adherence level of $\geq 95\%$ using 1 week recall. The desire to be alive (42.7%) and protect the unborn child (40.2%) respectively were the greatest motivation for good adherence. Fear of stigma and discrimination (65.0%) was the most common reason for non-adherence. Occupation, HIV status disclosure, Prevention of Mother-to-Child Transmission (PMTCT) experience, good knowledge of HIV/ART and having a treatment partner were found to be significantly associated with good adherence at chi-square (χ^2) analysis. The effect of disclosure of HIV status, having a reliable treatment supporter, identifying reasons for non-adherence, (PMTCT) before and after delivery and good knowledge of ART/HIV will help in indicating the process of adherence.

INTRODUCTION

Human Immuno-Deficiency virus (HIV) is a major sexually transmitted deadly disease that affects 40.3 million people worldwide (UNDP, 2011); with unprotected heterosexual intercourse being the major route of transmission. The United Nation on AIDS reported that there are approximately 5-10% of these infections worldwide are in children, more than 90% of them are infected during pregnancy (UNAIDS, 2008). Mother-to-child transmission is one of the mode of HIV transmission; vaginal delivery contribute 60-70%, breast feeding 20 – 30% while in-utero infection occur in less than 10% (UNAIDS, 2008). Without preventive intervention, about 25 – 40% of infants born to HIV-positive mother's contract the virus, (Abdulsalami and Tekena, 2006).

Following the introduction of ART therapy, the rates of mother-to-child transmission of HIV infection has crashed to less than 20% (Homsy *et al.*, 2006). However, the success of the antiretroviral therapy is dependent on both the intrinsic properties of the drugs and the individual's ability to take the prescribed medication (Igwegbe, *et al.*, 2010). Therefore, adequate adherence to the prescribed antiretroviral medication is essential to achieving viral suppression necessary to prevent mother-to-child transmission. Adherence rates exceeding 95% are necessary to maximize the benefits of the antiretroviral therapy. Higher levels of drug adherence are also associated with improved virological, immunological and clinical outcome (Murphy *et al.*, 2000).

In Nigeria, an estimated 3.6% of the populations are living with HIV and AIDS (UNAIDS, 2008). The World Health Organisation (WHO) in partnership with United Nations on AIDS (UNAIDS) and United Nations Children's Fund (UNICEF) in 2008 reported that 360,000 children were living with AIDS in Nigeria, most of whom become infected from their mother, and this has increased from 220,000 children infected in 2007 (WHO/UNAIDS/UNICEF,

2011). Combination therapies of antiretroviral drugs are the treatment of choice in HIV and non-adherence is the most important factor in the treatment failure (Tunner, 2002). Therefore, to ensure that treatment works effectively, it is pertinent that the drugs are taken every time, that is 100% medication adherence. Sethi (1979) illustrated that if medication adherence levels were between 70% and 90%, then there will be an increase rate of resistance forming. If 95% medication is not achieved, that treatment success becomes precarious.

Adherence to antiretroviral therapy poses challenges to HIV infected persons particularly in pregnant women. Nachega *et al.* (2006) states that several methods have been employed to measure adherence but no good standard has been established. Available methods include pill counts, self report, prescription refills, medication event monitoring system (MEMS), biological markers and assays (Holzemer *et al.*, 1999). However, the need for a high level of adherence to antiretroviral therapy (HAART) has remained a major hurdle to achieving maximal benefit from its use in pregnancy. Also, the success of HAART has not only improved longevity in HIV infected individuals but in addition has had a significant impact on the rate of mother-to-child transmission of HIV infection (MTCT) (Ikechebelu *et al.*, 2009). The poor adherence to antiretroviral drugs during pregnancy can lead to suboptimal viral suppression, development of viral resistance, higher risk of mother-to-child transmission, and mother-to-child transmission of HIV resistance strains (Hayman, 2009). Therefore the study aimed to determine the factors influencing adherence to ART among HIV positive pregnant women accessing mother-to-child transmission services in Uyo, Akwa Ibom State.

MATERIALS AND METHODS

Study Area/Setting

This study was carried out in Uyo Capital City of Akwa Ibom State, Nigeria, from July to December, 2012. The study was conducted at the HIV treatment centre of two major hospitals namely; University of Uyo Teaching Hospital (UUTH) and St. Luke's Hospital, Akwa Ibom. These centres provide an outpatient Prevention of Mother-To-Child Transmission (PMTCT) of HIV infection services; likewise adult and paediatric HIV services. Pregnant-infected women are referred for HIV counseling and testing unit of the study centres, which takes place twice a week. Intrapartum care is provided for these women in collaboration with other hospitals within Uyo metropolis. Antenatal, Post-natal and infant post exposure prophylaxes are provided by UUTH and St. Luke's Hospital. Health workers from collaborating centres have also been trained on intrapartum care of HIV-positive mothers.

Study Population and Design

A cross-sectional survey was conducted among pregnant women with known trimester either by date or early ultrasound seen during the study period, and those who gave informed consent were enrolled. At the period of conducting this study, a total of 168 pregnant HIV positive women were registered for PMTCT services. A precision of 5% for a proportion of 50% using chi-square (χ^2) at 95% level of significance, therefore a sample size of 25 participants was required. To attest to the strength of this study, enrollment was made for all HIV positive pregnant women who attend PMTCT clinic during the duration of this study provided the sample size of 25 is observed.

Questionnaires were administered to participants who met the criteria and gave consent to participate in the study. Information on demographic, socioeconomic characteristics, knowledge of HIV and antiretroviral drug medication, adherence pattern, factors that encourage adherence and possible risk factors that result in missing drugs were the basic questions. Adherence was measured by expressing the number of doses prescribed. This was in accordance to the example made by the Federal Ministry of Health (FMOH) in 2007, that, if 20 doses are prescribed and 19 doses are taken, adherence is 95% (FMOH, 2007; Ekama *et al.*, 2012).

Data Analysis

Data were compiled, coded and analysed using SPSS, windows version 17. Simple proportion and rates were used to analyse various parameters. Descriptive analysis were first performed followed by chi-square (χ^2) analysis of the determinant factors associated with good adherence, at a level of significance $P < 0.05$.

Ethical Consideration

Ethical clearance and approval was obtained from the Management of the University of Uyo and Akwa Ibom State hospital Board, as well as other sub-collaborating centre in Uyo, Nigeria. Written informed consent was obtained from all women for the use of their data for study. Participants who declined consent to participate in the study were provided care but excluded from the study.

RESULT

Out of the 102 eligible HIV pregnant women consented and recruited for this study, 82 (80.4%) of the interviewed participants reported performing adherence level of $\geq 95\%$ using 1 week recall method, with a non adherence rate of 19.6%.

Table 1 shows the socio-demographic characteristics of the participants. Majority of the women aged 31-35 years (56.9%), have at least one living child (79.4%), married (86.3%), employed/working (64.7%) and had at least secondary education (81.4%).

Table 1: The sociodemographic characteristics of the participants enrolled in the study

Sociodemographic characteristics	No. of women (%)
<i>Age (yrs)</i>	
N = 102	
<i>Mean age \pm SD (31.7 \pm 4.2)</i>	
≤ 20	3 (2.9)
21 – 25	6 (5.9)
26 - 30	22 (21.6)
31 – 35	58 (56.9)
36 – 40	10 (9.8)
≥ 41	3 (2.9)
<i>Parity (Family size)</i>	
0	21 (20.6)
1 – 2	54 (52.9)
> 2	27 (26.5)
<i>Marital status</i>	
Single	14 (13.7)
Married	88 (86.3)
<i>Occupational status</i>	
Employed/working	66 (64.7)
Unemployed	36 (35.3)
<i>Educational status</i>	
Tertiary	28 (27.5)
Secondary	55 (53.9)
Primary	19 (18.6)

* SD – Standard deviation

Table 2 summarizes pregnant and HIV-related characteristics. 80 (18.4%) of the participants had disclosed their HIV status and their disclosure was to their partners in most of the cases (89.2%). Most women were on first line HAART regimen (59.8%), while others were either on non-HAART prophylactic regimen (24.5%) or 2nd line HAART regimen (16.7%). However, 57.8% and 65.9% of the women have had previous PMTCT experience and were within the third trimester respectively. Their knowledge of HIV and antiretroviral therapy were very good over 78% of the participant have very good knowledge. The use of treatment support was relatively common as greater than half of the women had a treatment supporter (59.8%) which is the spouse in most cases. On the other hand, Table 3 recorded the outcome of sub-analysis

of factors responsible for adhering to the antiretroviral therapy among the women that had adherence level > 95%. The desire to be alive and stay healthy was the greatest motivation (42.7%), these are some of the participants' written expressions "I want to live long and train my children", "to keep me healthy and sound", "fulfilled my life dreams and aspirations". The desire to ensure that the unborn child is protected from HIV infection was the other motivators for adhering to ART (40.2%). These are some of the participants' written expression "I do not want to live with the guilt of infecting my baby", "I learnt my baby will not be infected if I take my drugs" and "I want to protect my baby".

Table 2: Distribution of pregnancy and HIV related characteristics of the women in the study

HIV related characteristics	n (%)
<i>HIV status disclosure</i>	Total (N) = 102
Disclosed	80 (78.4)
Not disclosed	22 (21.6)
<i>ARV drug regimen</i>	
Mono and dual therapy	26 (24.5)
First line HAART	61 (59.8)
Second line HAART	17 (16.7)
<i>Trimester</i>	
First	12 (11.8)
Second	23 (22.5)
Third	67 (65.9)
<i>Previous PMTCT</i>	
Yes	59 (57.8)
No	43 (42.2)
<i>Knowledge of ART/HIV</i>	
Good	80 (78.4)
Poor	22 (21.6)
<i>Has treatment support (Assistant or Reminder)</i>	
Yes	61 (59.8)
No.	41 (40.2)

Table 3: Factors responsible for Adherence to ART among participants with over 95% adherence level

Factors responsible for adhering	n (%)
To be alive and stay healthy	35 (42.7)
To protect my unborn child	33 (40.2)
Informed by my previous PMTCT experience	13 (15.9)
Others	17 (20.7)

* No. of participants greater than 82 because of multiple responses

Table 4 is a summary of factors responsible for missing or skipping drugs among non-adherence participants. Majority of participant gave reason of fear of being identified as HIV positive (65.0%), followed by forgetfulness (55.0%) and tight work schedule (50.0%). Other reasons like difficulty in swallowing pills and fear of side effect (40.0%) were also common factors for skipping or missing drugs.

Table 5 shows the chi-square (χ^2) analysis of some possible factors with good drug adherence. Only five variables out of the nine, which are occupation ($\chi^2 = 12.940$, $df = 1$, $P < 0.05$), HIV status disclosure ($\chi^2 = 5.042$, $df = 1$, $P < 0.05$), PMTCT experience ($\chi^2 = 14.007$, $df = 1$, $P < 0.05$), good knowledge of HIV/ART ($\chi^2 = 5.042$, $df = 1$, $P < 0.05$) and having a treatment supporter ($\chi^2 = 22.195$, $df = 1$, $P < 0.05$) were found to be significant associated with good adherence.

Table 4: Factors responsible for missing drugs among 20 participants that had less than 95% adherence level

Risk factors	n (%)
Fears of stigma and discriminations	13 (65.0)
Forgetfulness	11 (55.0)
Work schedule	10 (50.0)
Slept off	7 (35.0)
Religious belief	9 (45.0)
Lack of food (supplement required to take ARV drug)	4 (20.0)
Other factors	8 (40.0)

* No. of respondents greater than 20 because of multiple risk factors

Table 5: Factors associated with good adherence among participants

Factor	Adherent participants (%), N = 82	Non-adherent participants (%), N=20	Significance
<i>Age (yrs)</i>			
≤ 20	2 (2.4)	1 (5.0)	
21 – 25	4 (4.9)	2 (10.0)	
26 - 30	19 (23.2)	3 (15.0)	$\chi^2 = 4.941$ df = 6
31 – 35	49 (59.8)	9 (45.0)	
36 – 40	6 (7.3)	4 (20.0)	P>0.05
≥ 41	2 (2.4)	1 (5.0)	
<i>Parity (Family size)</i>			
0	15 (18.3)	6 (30.0)	$\chi^2 = 3.294$ df = 2
1 – 2	47 (57.3)	7 (35.0)	
> 2	20 (24.4)	7 (35.0)	P>0.05
<i>Marital status</i>			
Single	10 (12.2)	4 (20.0)	$\chi^2 = 0.820$ df = 1; P>0.05
Married	72 (87.8)	16 (80.0)	
<i>Occupational status</i>			
Employed/working	60 (73.2)	6 (30.0)	$\chi^2 = 12.940^{**}$ df = 1; P<0.05
Unemployed	22 (26.8)	14 (70.0)	
<i>Educational status</i>			
Tertiary	26 (31.7)	2 (10.0)	$\chi^2 = 3.981$ df = 2; P>0.05
Secondary	41 (50.0)	14 (70.0)	
Primary	15 (18.3)	4 (20.0)	
<i>HIV Status Disclosure</i>			
Disclosed	68 (82.9)	12 (60.0)	$\chi^2 = 5.042^*$ df = 1; P<0.05
Not disclosed	14 (17.1)	8 (40.0)	
<i>PMTCT experience</i>			
Yes	40 (48.8)	19 (95.0)	$\chi^2 = 14.007^{**}$ df = 1; P<0.05
No	42 (51.2)	1 (5.0)	
<i>Knowledge of HIV/ART</i>			
Good	68 (82.9)	12 (60.0)	$\chi^2 = 5.042^{**}$ df = 1; P<0.05
Poor	14 (17.1)	8 (40.0)	
<i>Has treatment supporter (Assistant or Reminder)</i>			
Yes	58 (70.7)	3 (15.0)	$\chi^2 = 22.175^{**}$ df = 1; P<0.05
No.	24 (29.3)	17 (85.0)	

* Significant,

** High significant

DISCUSSION

In this study, the adherence rate of 80.4% was observed among our respondents. Though comparable to 80.6% and 78.3% reported by Ekama *et al.* (2012) and Igwegbe *et al.* (2010) respectively, it is much higher than 62.9% and 60.4% reported by Olowookere *et al.* (2008) and Shaahu *et al.* (2008) in other parts of Nigeria. Comparing our findings with that of Ekama *et al.* (2012) and Igwegbe (2010), and unlike the two studies by Olowookere *et al.* (2008) and Shaahu *et al.* (2008) respectively, it seems that adherence among pregnant women is much better and

successful among pregnant women in Uyo, especially on yearly basis. It is not unusual that women are willingly and ready to do all it takes, in order to ensure 'safety' living, as well as the well being of their offspring(s). The above statement is confirmed in this study in which 42.7% and 40.2% of the adherent women gave reason of keeping themselves healthy and sound, and protecting their unborn child from HIVs infection as their major motivator for taking their pills as prescribed.

It is however known that effective strategies such as the use of ARV drugs, avoiding unplanned and unwanted pregnancy in HIV positive women, prevention of prolonged rupture of membrane, safe delivery and infant feeding options, reduction of unnecessary and unwarranted surgical intervention during pregnancy and labour, and many more, are necessary in combating and reducing mother-to-child transmission of HIV infection (Ikechebelu *et al.*, 2009; Homsy *et al.*, 2006). Antiretroviral (ARV) drugs can only achieve the required effect at adherence level at least 95% (Ikechebelu *et al.*, 2009). Poor adherence to ARV drug has been reported to be the major challenge to achieving the goal of antiretroviral therapy (Ezechi *et al.*, 2005). Moreso, many factors have been cited as possible responsible for non adherence in HIV positive adults (Shaahu *et al.*, 2008; Olowookere *et al.*, 2008; FMOH, 2007; Ezechi *et al.*, 2005; Idigbe *et al.*, 2005 and Iliyasu *et al.*, 2005), but moderately few adherence studies have been reported in HIV positive pregnant women (Ekama *et al.*, 2012; Igwegbe *et al.*, 2010; Jones and Bartholomew, 2005). Apart from factors preventing adherence in non-pregnant adult, the nausea and vomiting of pregnancy and possible effect of the drugs on the foetus are additional factors that make adherence in pregnancy challenging. However, the effective nausea and vomiting of pregnancy was not observed in this study, as majority of the women are referred patients after HIV diagnosis.

Among the non-adherent women (19.6%), similar reasons reported in other studies for missing drugs were found (Ekama *et al.*, 2012; Igwegbe *et al.*, 2010; Shaahu *et al.*, 2008; Olowookere, *et al.*, 2008 and Markos *et al.*, 2008). It therefore, shows that other personal and sociocultural factors but pregnancy related factors are the reasons for missing ARV drugs during pregnancy, but as a result of. Stigma and discrimination remain an important factors influencing quality HIV care, as 65.0% of women in things study expressed the reason for missing their drugs as afraid of being identified as HIV positive. Therefore, there is need for continued adequate campaign against stigma and discrimination if we must improve adherence to ART and uptake of other HIV related issues. Also, due to the sample size of this cohort, it is difficult to reach valid conclusions on whether parity (family size) is associated with medication adherence. This statement was originally poised to determine whether lack of privacy within the household affected patient's medication adherence.

The findings on HIV status disclosure and having a treatment support as factors associated with good adherence is in agreement with previous finding by Ekama *et al.*, (2012). With the disclosure of HIV status to partners, who is in most cases the husband, he will not only provide support but will serve as treatment partner for the spouse. There is therefore need to encourage these women to disclose their status to get the utmost benefit of disclosure. It is important, however, to note that women should not be forced to disclose their status, as HIV status disclosure has been reported to be accompanied with violence from partner (Ezechi *et al.*, 2009). Rather, women who decline to disclose should be encouraged and counseled until they feel safe to disclose. Furthermore, women should be encouraged to come along with a treatment supporter for the counseling process/session prior to initiation of ART preferably the spouse, which will help in educating partners appropriately and improving adherence in the long run. Good knowledge of HIV/ART was seen to be significantly associated with adherence, this show that continued and prompt awareness campaign against the disease have form a major panacea in combating the infection and decreased mother-to-child transmission risk.

It is pertinent to note that self-report used to assess adherence is not the gold standard for adherence assessment, but it has been reported to be sufficient enough to measure adherence when pill count is not possible and electronic devices and blood ARV blood measurement are not feasible (Ezechi *et al.*, 2005; Ekama *et al.*, 2012).

CONCLUSION AND RECOMMENDATION

This study has shown that good adherence is attainable during pregnancy which is as a result of mother's willingness to do anything to ensure their safety and that of their offsprings. However, more is required to achieve 90% adherence rate. Therefore, the effect of disclosure of HIV status, having a reliable treatment assistant, identifying reasons for non-adherence, and adequate knowledge of HIV/ART will be used and are recommended to enhance the process of adherence counseling.

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