

Prevalence and factors associated with erectile dysfunction in male patients with human immunodeficiency virus in a teaching hospital in West Malaysia

Enoma Aghahowa, B Sc¹, Siew Mooi Ching, MFamMed^{1,2}, Fan Kee Hoo, MRCP³, Sharifah Faridah Syed Omar, MMed⁴

¹Department of Family Medicine, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, 43400, Serdang, Selangor, Malaysia, ²Malaysian Research Institute on Ageing, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, Serdang, Malaysia, ³Department of Medicine, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, 43400, Serdang, Selangor, Malaysia, ⁴Department of Medicine, Department of Medicine, Faculty of Medicine, University of Malaya, 50603 Kuala Lumpur, Malaysia

ABSTRACT

Introduction: Erectile dysfunction (ED) has been associated with the treatment of human immunodeficiency virus (HIV) and chronic diseases. Sexual dysfunction data of male patients infected with HIV are still scarce in Malaysia, and ED appears to be under-reported. Therefore, this study aims to determine the prevalence and predictors of ED among male HIV patients at the University Malaya Medical Centre.

Methods: A cross sectional study was conducted among male HIV patients on antiretroviral therapy (ART) attending the outpatient clinic of a teaching hospital in Malaysia. A systematic random sampling method was employed in the selection of respondents. Participants were interviewed using a structured questionnaire with a 15-item international index of erectile function (IIEF-15). An appropriate statistical analysis was used to determine the associate and potential risk factors.

Results: A total of 220 males participated in this study with a mean age of 37.9±9.9; prevalence of ED among HIV patients was 82.3% (n=180). The severity of ED was further categorized into: severe (24.1%), moderate (19.1%), mild to moderate (20.9%), and mild (18.3%). In a multivariate logistic regression analysis, patients with a lower educational background were more likely to be associated with ED (odds ratio [OR] 2.62, 95% confidence interval [CI] 1.02-6.72; p-value 0.046).

Conclusion: This study reports that ED was prevalent among adult HIV males who are on an ART regimen. Those with a lower educational background are more likely to have ED. Hence, in managing patients with HIV, physicians should seek to identify those patients at risk of developing ED for further intervention.

KEY WORDS:

Erectile dysfunction; Antiretroviral Therapy, Highly Active; HIV; Sexual dysfunction; Malaysia; hospital; prevalence; male

INTRODUCTION

Studies have reported that human immunodeficiency virus (HIV) is emerging rapidly in Malaysia among the East Asia and Pacific regions.¹ By 2010, a total of 91,362 cases of HIV had been reported in Malaysia and 90.4% (n=82,603) of these were male.² The problems related to HIV, in particular towards its treatment, are also escalating. For example, sexual dysfunction is one of the important

reported side effects following antiretroviral therapy (ART).³ Among the ART drugs, indinavir has the highest rates of sexual dysfunction and nevirapine has the lowest.⁴

Sexual dysfunction can be further classified into three categories, which are erectile dysfunction (ED), ejaculatory disturbances and low sexual desire.⁵ ED has been shown to be associated with the use of didanosine, as well as other protease inhibitors.³ Furthermore, a local study reported that other psychosocial issues, such as depression, anger, guilt, feelings of being a failure and the feeling of letting a partner down during intercourse, were significantly associated with patients suffering from ED.⁶

According to the *Diagnostic and Statistical Manual of Mental Disorders (fifth edition)*, ED is characterized by a recurrent inability to achieve or maintain an adequate erection during partnered sexual activities.⁷ ED can have a profound impact on an individual's perceived quality of sexual life, which can further affect a patient's compliance towards ARV regimens; their sexual performance may also be affected.⁸ This could become a vicious cycle, as it is common for HIV patients to have low moods, showing less or no interest in sex and a decreased performance in sexual activity or vice versa.³ Since we know that the cause of ED in HIV adults is multifactorial, it could be of psychogenic or organic origin.⁹ Patients may link it to the antiviral agent instead of HIV itself, which may cause a delay in asking for help if they wait to see if the ED disappears on its own. Furthermore, the stigmatization or embarrassment of having ED or its symptoms may lead to the under-reporting or under-diagnosing of ED among HIV adult males.¹⁰ A recent study found that psychological factors of patients pose a significant impact on the occurrence of ED.¹¹

To our knowledge, there is a lack of information on ED among HIV subjects in Malaysia: a Muslim-majority country where sex-related issues are quite sensitive. This may create barriers for HIV patients in getting more sexual health related information and support. This study aims to determine the prevalence and associated factors of ED in male patients with HIV in a teaching hospital. We hypothesize that ED is more prevalent in male patients with HIV who are undergoing ART.

MATERIALS AND METHODS

This was a cross-sectional study conducted among registered male HIV patients of a medical clinic in the University Malaya Medical Centre, a teaching hospital in Kuala Lumpur, Malaysia. The Hospital

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Corresponding Author: Ching Siew Mooi

Email: sm_ching@upm.edu.my

Table I: Distribution of male HIV respondents by social demographic characteristic

Variables	Frequency	Percentage	Mean ± SD
Age (n=217)a			37.9±9.9
<50	192	88.5	
≥50	25	11.5	
Ethnicity (n=218) b			
Malay	71	32.6	
Chinese	124	56.9	
Indian	16	7.3	
Others	7	3.2	
Educational Level (n=220)			
No formal education	1	0.4	
Primary	3	1.4	
Secondary	72	32.7	
Tertiary	144	65.5	
Occupation(n=220)			
Unemployed	20	9.1	
Employed	200	90.9	
Household Income(n=198) c			
< RM4000	113	57.1	
≥ RM4000	85	42.9	
Smoking (n=219) d			
Yes	91	41.6	
No	128	58.4	
Alcohol Intake(n=219) d			
Yes	94	42.9	
No	125	57.1	
Marital Status (n=219) d			
Single	179	81.7	
Married	35	16	
Divorced	4	1.8	
Widow/Widower	1	0.5	

Note: a 3- missing; b 2 -missing ; c 22- missing; d _1 missing

Table II: Clinical variables of male patients with HIV at University Malaya Medical Centre (N=220)

Clinical Variables	n (%)	Mean ± SD	Median(IQR)
Mode Of Transmission, n (%)			
Heterosexual	59(26.8)		
Intravenous Drug User	21(9.5)		
Men who have sex with men	140(63.6)		
Co-morbidities, n (%)			
Diabetes Mellitus	4(1.8)		
Ischemic Heart Disease	6(2.7)		
Hypertension	22(10.0)		
Dyslipidemia	33(15.0)		
Current CD4 count			527 (312)
Viral load		172±2151	
PHQ-2 score		1.3±1.5	
Duration on ART in months		33±41	
NADIR CD4 count			116 (232)

PHQ-2 (Patient health question-2 item), ART (Antiretroviral therapy), NADIR CD4 count

Table III: Comparison between clinical variables among HIV patients with and without erectile dysfunction

Variables	ED, n (%)	No ED, n (%)	p-value
Ethnicity (n=218)			0.72
Chinese	103(83.1)	21(16.9)	
Non-Chinese	76(81.3)	18(18.8)	
Education level (n=220)			0.01
Non-tertiary	70(92.1)	6(7.9)	
Tertiary	111(77.1)	33(22.9)	
Occupation (n=220)			0.54
Employed	163(81.5)	37(18.5)	
Unemployed	18(90)	2(10)	
Smoking (n=219)			0.94
Yes	75(82.4)	16(17.6)	
No	105(81.5)	23(18)	
Alcohol intake (n=219)			0.26
Yes	74(78.7)	20(21.3)	
No	106(84.8)	19(15.2)	
Marital status (n=219)			0.9
Single	147(82.1)	32(17.9)	
Non-single	34(82.5)	7(17.5)	
Household Income (n=198)			0.04
<4000	98(86.7)	15(13.3)	
≥4000	64(75.3)	21(24.7)	
Age (n=217)			0.41
<50	156(81.2)	36(18.8)	
≥50	22(88.0)	3(12.0)	
High risk behaviour			
IVDU	17(81.0)	4(19.0)	0.975
Heterosexual	49(83.1)	10(16.9)	
MSM	115 (82.1)	25(17.9)	
Diabetes mellitus			0.349
Yes	4(100.0)	0(0.0)	
No	177(81.9)	39(18.1)	
Ischemic heart disease			0.594
Yes	6(100.0)	0(0.0)	
No	175(81.8)	39(18.2)	
Hypertension			0.068
Yes	21(95.5)	1(4.5)	
No	160(80.8)	38(19.2)	
Dyslipidaemia			0.621
Yes	26(78.8)	7(21.2)	
No	155(82.9)	32(17.1)	
Current CD4 count, mean rank	108	123	0.18
Viral Load, mean rank	110	114	0.702
NADIR CD4 count, mean rank	103	103	0.954
Months on ART, mean rank	107	100	0.504
PHQ-2, ,mean rank	112	103	0.408

PHQ-2 (Patient health question-2 items), ART (Antiretroviral therapy), IVDU (Intravenous drug user), MSM (Man have sex with man)

Table IV: Predictors of erectile dysfunction among male patients with HIV (n=220)

Variables	Crude Odds Ratio (95%CI)	Crude analysis p-value	Adjusted Odds Ratio** (95%CI)	Adjusted p-value
Educational level				
Non-tertiary	3.468(1.382-8.702)	0.008	2.618(1.018-6.732)	0.046*
Tertiary	1		1	
Current CD4 count	0.999 (0.998, 1.000)	0.04	0.999(0.998-1.000)	0.066
Hypertension				
Yes	4.987(0.650-38.243)	0.122	4.406(0.551-35.237)	0.162
No	1		1	
PHQ score	1.174 (0.902, 1.527)	0.232	1.266(0.935-1.715)	0.127
Household income				
<RM4000	2.144(1.029-4.465)	0.042	1.488(0.675-3.277)	0.324
≥ RM4000	1		1	
Age				
≥ 50	1.692(0.480-5.963)	0.413	2.603(0.491-13.803)	0.261
< 50	1		1	

OR: Odds Ratio

CI: Confidence Interval

*statistically is significant as the p-value is <0.05

** Adjusted for education, current CD4 count, hypertension, PHQ-2 score, household income and age.

provides primary, secondary and tertiary levels of health care. The study was conducted from 30 April 2015 - 22 January 2016. Ethical clearance was obtained from the Health Research Ethics Committee of the Hospital, UMMC (MECID NO: 20152-996). Those patients at risk of having ED at the end of study were reviewed by the physician to identify traceable cause before a urology referral was made.

All HIV patients aged 18 and above, who were able to read and understand either Malay or English and were registered under an infectious disease clinic with a minimum follow-up of six months, were eligible for the study. After the initial screening, a systematic random sampling method was used to recruit the respondents. In addition, we recruited those that had been sexually active in the past one month regardless of their marital status.

The sample size calculation was based on the study done by Gustavo Romero-Velez^{10,12} in Mexico. The calculated sample size was 220.

Informed consent was obtained from the participants prior to the study. Patients' socio-demography, which includes age, race, educational level, occupation, monthly income, marital status, tobacco use and alcohol consumption, were obtained via self-administered questionnaires. The Malay Version of the International Index of Erectile Function (MVIIEF)¹³ and Patient Health Questionnaire (PHQ-2)¹⁴ were the other two assessment tools used in this study to obtain the data on ED and depression. In MVIIEF, an erectile function domain was used to evaluate the patient's level of severity of ED. Those with a score of ≥25 were classified as individuals without ED and those with a score <25 were considered to have ED. The severity of ED was further classified into mild (a score of 19-24), mild to moderate (13-18) moderate (7-12) or severe (0-6).¹⁵ The PHQ-2 inquired about the frequency of depressed mood and anhedonia over the past two weeks. For PHQ-2, the score for each item ranges from 0 to 3. '0' indicates 'not at all' and '3' indicates 'nearly every day'.¹⁶ Patients' medical records were also reviewed to obtain data on their mode of transmission, viral load, current CD4 count, duration of treatment, Nadir CD4 count and co-morbidities (diabetes, ischemic heart disease and dyslipidaemia). The current CD4 count was based on the latest report of the CD4 count in the last 6 months of the study period. The Nadir CD4 count was the baseline CD4 count at the commencement of treatment or the first CD4 count done before treatment.

For data analysis, all analyses were performed using IBM SPSS version 22.0. A P-value less than 0.05 was considered as statistically significant at a 95% confidence interval. We used an independent t-test to determine the difference between two continuous variables if the distribution is normal. The association between clinical variables

and ED was tested using a univariate analysis. We used a multivariate logistic binary regression analysis to determine the predictors of ED after adjusting for confounding factors. A P-value <0.05 was determined as the level of significance.

RESULT

A total of 220 HIV male patients were recruited in this study. The socio-demographic profile and clinical profiles of the respondents is reported in Table I and Table II. The mean age of the respondents was 37.9±9.9 (ranging from 22 – 73 years). Most of the patients were Chinese (56.4%), followed by Malays (32.3%), Indians (7.3%) and others (3.2%). Two thirds of the respondents had an education background up to tertiary level (65.5%).

90.5% of the patients were employed. The household income in our study population ranged from USD 175 – USD 15,000 with half of them earning less than USD 1,000 (51.4%). Two fifths (41.4%) were current smokers, while 56.8% consumed alcohol. As for the marital status of the study population, 81.4% were single and 15.5% married, while divorcees and widowers were 1.8% and 0.5% respectively. Men who had sex with men was the most common mode of transmission (63.6%) in this study population.

The prevalence of ED was high among HIV infected patients, with a rate of 82.3% (severe 24.1%, moderate 19.1%, mild to moderate 20.9% and mild 18.3%). The association of ED with demographic factors, clinical and co-morbidities is summarized in Tables III. In a multivariate logistic regression analysis, patients with a lower educational level were at risk of having ED with a p-value of 0.046 (Table IV). Other variables (current CD4, hypertension, PHQ score, household income and age) were not significantly associated with ED in this study population.

DISCUSSION

Prevalence of ED among male patients with HIV in our study population was high (82.3%). This result was much greater (82% versus 69%) than another local study in Malaysia.¹⁷ However, the population in that study consisted of the Malaysian general population.¹⁷ As ART and HIV disease itself can cause ED, the higher prevalence of ED among HIV patients compared to the general population was an unexpected finding. Similarly, other studies have also reported that the prevalence of ED among the general population ranges from 17.7% to 71.2%.¹⁸

In this study, patients who have a lower education level were found to be associated with ED on a multivariate logistic regression

analysis. This is similar to the findings of the literature, in which a study done in Colombo, Sri Lanka showed that those with a lower education level were more likely to have ED.¹⁹ Similarly, other studies also show that people with a higher level of education have a lower risk of developing erectile dysfunction.²⁰

None of the clinical variables (viral load, Nadir CD4 count, current CD4 count, duration of ART treatment and PHQ2) and co-morbidities (dyslipidaemia, DM, IHD and hypertension) were associated with ED in this study. This is consistent with another Mexican study by Romero-Velez et al.¹⁰ A study done in Milan, Italy revealed that the CD4 count was one of the predictors of ED (HR 0.99 per one CD4 cell more; 95% CI 0.99–0.99, $p=0.013$).²¹ In this study, the CD4 count could be the potential predictor for ED as it statistically tests nearly significant (p -value 0.06).

A local study reported that the prevalence of depression was quite high (44.4%) among those on methadone.²² Similarly, in our study, patients with ED have a higher PHQ2 score compared to those without ED. Despite this, the PHQ2 score was not ultimately significant in the multivariate binary logistic regression, but this could be due to the small sample size.

The implication from this study was that the clinicians need to do a routine assessment of ED among patients on ART, especially those with a lower educational background in order to initiate early intervention.

This is the first comprehensive study conducted on male subjects with HIV in Malaysia. Furthermore, the sample size of the study is relatively larger than another local study on ED among patients on Methadone.²³ This study has some limitations; firstly, time constraint is one of the most important factors that limited us from recruiting samples from other centres. Secondly, there was lack of reporting on ED by the respondents' spouses, or their sexual partners. It is pertinent to include them as part of the study, as we can get more information on their occupation or relationship status. However, most of the respondents (81.4%) in this study were single and this clearly makes it difficult to obtain relevant sexual information from the spouse. Furthermore, methamphetamine abuse among patients with HIV is common and the respondents may not be able to recall their respective sexual partners in these circumstances.²⁴ Thus, we have to interpret the results of this study cautiously within the context of its limitations.

We are also aware that hypogonadism and other medication use may be attributed to ED among male patients with HIV. This condition occurs when certain medications like ketoconazole, fluconazole, ganciclovir, methadone, and antidepressants are used concurrently, as these medications may decrease the level of testosterone and thus cause ED. However, it was not measured in this study due to the time and budget constraints. We recommend including this variable in a future Malaysian study.

CONCLUSION

This study reports that ED was prevalent among male patients with HIV. The potential predictor for ED in our study is those with a lower educational background compared with those with a higher education one. However, this interpretation must be treated with great caution as the majority of the respondents in this study's population are single.

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