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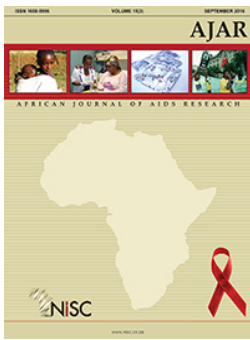
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Clinical correlates of suicidality among individuals with HIV infection and AIDS disease in Mbarara, Uganda

Godfrey Zari Rukundo^{1*}, Eugene Kinyanda² and Brian Mishara³

¹Department of Psychiatry, Mbarara University of Science and Technology, Mbarara, Uganda

²Department of Psychiatry, Makerere College of Health Sciences, and Medical Research Council, Entebbe, Uganda

³Centre for Research and Intervention on Suicide and Euthanasia and Psychology Department, Université du Québec, Montreal, Canada

*Corresponding author email: grukundo@must.ac.ug

The association between suicidality and HIV/AIDS has been demonstrated for three decades, but little is known about risk factors that can help understand this association and help identify who is most at risk. Few research studies have been conducted in sub-Saharan Africa, a region that accounts for more than 70% of the HIV global burden. This paper describes clinical risk factors for suicidality among individuals with HIV infection and AIDS disease in Mbarara, Uganda. In this study, suicidality includes both suicidal ideation and suicidal attempts. A cross-sectional survey was conducted with 543 HIV-positive individuals aged 15 years and above, recruited from 2 HIV specialised clinics in Mbarara. Using logistic regression analysis, factors significantly associated with suicidality at 95% confidence interval were identified. The rate of suicidality was 10% ($n = 54$; 95% CI: 5.00–15.00). Risk factors for suicidality were: perception of poor physical health (OR 2.22, 95% CI 1.23–3.99, $p = 0.007$), physical pain (OR 1.83, 95% CI 1.01–3.30, $p = 0.049$), reducing work due to illness (OR = 2.22, 95% CI 1.23–3.99, $p = 0.004$) and recent HIV diagnosis (OR 1.02, 95% CI 1.01–1.03, $p = 0.001$). These findings suggest that HIV/AIDS in south-western Uganda is associated with a considerable burden of suicidality. HIV is associated with several clinical factors that increase vulnerability to suicidality. There is need for more appropriate interventions targeting these clinical risk factors, systematic suicide risk assessment and management of suicidal ideation and behaviours in HIV care.

Keywords: physical illness, risk factors, suicide, suicidal attempt, suicidal ideation, prevention

Introduction

There is substantial evidence indicating that poor physical health and mental illness are closely related (De Hert et al., 2011; Rukundo, Musisi, & Nakasujja, 2013; Thornicroft, 2011). Psychological consequences of physical illness include depression, suicide, anxiety and hopelessness. In contrast, mental disorders predispose the sufferers to physical illness (Jones, Howard, & Thornicroft, 2008). Although limited information exists on the prevalence of suicidality among the physically ill, several studies report that among suicides, 30% to 40% usually have a physical illness (Druss & Pincus, 2000; Erlangsen, Stenager, & Conwell, 2015; Mishara, 1998; Wiktorsson et al., 2015). Increased risk of suicidality has been reported in physical illnesses that are chronic, terminal or associated with shame as part of psychological pain (Fässberg et al., 2016; Goodwin, Marusic, & Hoven, 2003; Timonen et al., 2002). The relationship between physical illness and suicide cannot be explained by a single factor (Harwood, Hawton, Hope, Harriss, & Jacoby, 2006). The physical illnesses that are associated with an increased risk for suicidality include HIV/AIDS, certain cancers, epilepsy, cerebral disease, renal disease, ischemic heart disease, chronic pulmonary disease, peptic ulcer, prostatic disease, and multiple sclerosis

(Ferreira et al., 2007; Qin, Webb, Kapur, & Sorensen, 2013; Quan, Arboleda-Florez, Fick, Stuart, & Love, 2002).

Globally, HIV infection is considered a chronic disease such as hypertension or diabetes. However, in some countries, HIV is still stigmatised and considered as a killer disease (Akena, Musisi, Joska, & Stein, 2012; Kelly et al., 2014; Klopper, Stellenberg, & van der Merwe, 2014; Kohler et al., 2014; Ky-Zerbo et al., 2014; O'Brien & Broom, 2014; Sulstarova et al., 2015). HIV may affect the central nervous system, possibly affecting impulse control and disinhibition of behaviours that may increase the risk of suicide. Although there is limited evidence, it is possible that physical symptoms of HIV/AIDS could be responsible for the increased risk, as with other physical illnesses (Erlangsen et al., 2015). Despite the low research coverage in sub-Saharan Africa, it is possible that HIV/AIDS in Africa maybe associated with a high risk for suicidality (Kinyanda, Hoskins, Nakku, Nawaz, & Patel, 2012; Ndeti, Khasakhala, Mutiso, & Mbwayo, 2010).

People with medical illness do not always have an increased risk of suicidal behaviours. Some studies have reported that persons with severe physical illness (e.g., AIDS) are less suicidal because they are more concerned about their health and getting better than ending their own life (Kaplan, McFarland, Huguet, & Newsom, 2007;

McKegney & O'Dowd, 1992). This study investigated the clinical factors with suicidality among HIV-positive persons attending two HIV clinics in Mbarara municipality, south-western Uganda. In this study, we use the term, "suicidality" to combine suicidal ideation and suicidal attempts.

Methods

Study design and location

This was a descriptive cross-sectional study conducted at the Immune Suppression Syndrome (ISS) clinic of Mbarara Regional Referral Hospital (MRRH) and The AIDS Support Organization (TASO) Mbarara branch clinic using quantitative methods. Both clinics receive and provide care to HIV-positive patients and are located in Mbarara municipality south-western Uganda. The ISS clinic is part of Mbarara regional referral hospital and TASO is a non-governmental organisation in Uganda that pioneered care for patients with HIV/AIDS in 1987.

Participants

The participants were individuals living with HIV, registered and attending either of the clinics.

Inclusion and exclusion criteria

Before being included in the study, the participants had to meet the following criteria:

- Age of 15 years or more
- Signed informed consent, and assent for people younger than 18 years
- Being strong enough to provide information
- Registered and receiving care from either ISS or TASO clinic in Mbarara.

Study tools

Screening for suicidality was conducted using five questions about death and suicidality, four of which were used in the study on suicide attempts in the Epidemiologic Catchment Area Study by Moscicki et al. (1988) in the United States. The five questions have previously been used in Uganda by Kinyanda et al. (2012). The questions were: (1) Have you thought a lot about death in the past? (2) Have you felt like you wanted to die in the past? (3) Have you felt so low, and thought about committing suicide in the past year? (4) Did you attempt suicide in the past year? (5) Have you ever attempted suicide at some other time in life? A participant who answered yes to any of the questions 3–5, was considered to be suicidal. The World Health Organization (WHO) clinical staging and CD4 counts were used to determine the stage of HIV infection at the time of the study (stages I, II, III and IV). Apart from knowing the clinical stage of HIV, association between suicidality and the following clinical factors were assessed: generalised lymphadenopathy, herpes zoster, oral ulcerations, weight loss of not more than 10%, recurrent upper respiratory tract infections (URTIs), chronic diarrhoea for more than a month, fevers for more than a month, oral thrush, Kaposi sarcoma, HIV related tumours cryptococcal meningitis, chronic cough not due to TB, physical pain and reduction in performance due to the illness.

Data collection and analysis

Participants were recruited on clinic days by the first author and research assistants. Data were collected using a semi-structured questionnaire that was interviewer administered for consistency, since some of the participants could not read and write. All questionnaires were translated into the locally spoken language (Runyankore-Rukiga). Data obtained from the respondents were recorded on the questionnaires and thereafter entered into the computer using SPSS version 16. A derived variable of suicidality was obtained by adding the people with suicidal ideation and attempts. The rate of suicidality was then calculated dividing the number of suicidal patients by the total number of study participants. Analysis of data involved generation of frequencies and means, bi-variate and logistic regression. Tests for significance were carried out using chi-square for categorical variables. Results were considered statistically significant if the p -value was ≤ 0.05 at 95% confidence interval. To determine the independent effects of each of the investigated clinical factors, logistic regression analysis was undertaken. In the final logistic regression model, only factors that were statistically significant in bivariate analyses were included.

Ethical considerations

The study was reviewed and approved by the Institutional Research and Ethics Committee (MUST-REC) of Mbarara University of Science and Technology and the leadership at the two study centres. Written informed consent was obtained from each adult participant. Participants below 18 years were contacted to give assent and then the primary caregivers provided written informed consent. The consent form was in both English and the local language. Participants signed the consent form after accepting that they themselves or their children could participate in the study. Participants who were too unwell (physically or mentally) to consent or provide information were not interviewed. There were no prior arrangements for a surrogate consent procedure for such individuals. Confidentiality was observed by having the interview in private and not having participant identifiers on the questionnaires and data sets. All participants found to have psychiatric illness or increased risk of suicidality were referred to the mental health unit of Mbarara Hospital for appropriate treatment. This was done in collaboration with the case managers at the two clinics.

Results

A total of 573 HIV-positive individuals were contacted and requested to participate in the study. Of the 573 persons contacted, 543 agreed to participate in this study assessing the association between clinical factors in HIV/AIDS and suicidality. Five percent ($n = 30$) of the patients refused to participate in the study for various reasons. The most common reason for non-participation was coming from too far away, that their employers had given them limited time for the clinic visit, the participants associating the study with the stigma of mental illness.

Forty-four percent ($n = 239$) of the participants attended the TASO clinic while 56% ($n = 304$) attended the ISS clinic (Table 1). Overall, 24% ($n = 131$) were males and 76% ($n = 412$) were

females. Their ages ranged from 15 to 70 years with a median of 36.0 years and a mean age of 36.7 years (SD = 9.7). The mean age of the males was significantly higher than that of the females (mean age of males = 39.4 years, SD = 10.6; mean age of females = 35.8 years, SD = 9.1; $t = 3.462$, $p = 0.001$). Most ($n = 284$; 52%) participants had attained only primary level education, 20% ($n = 107$) had no formal education, 22.7% ($n = 123$) had secondary school education and only 6% ($n = 32$) had post secondary or vocational training. More females (76%) than males (60%) were likely to have no formal education or only a primary level education (OR 1.65; 95% CI: 1.26–2.15; $p = 0.001$).

Fifty-six percent of the females ($n = 231$) were widowed, separated or divorced compared to 19% of the males (OR = 5.47, 95% CI 3.39–8.81 $p = 0.001$). There was a

statistically significant difference between males and females on employment status (OR = 1.81, 95% CI 1.22–2.69 $p = 0.003$), with the majority (60%) of the females being in the categories of peasants or the unemployed while most males (55%) were in formal employment or full-time business.

Prevalence of suicidality in HIV/AIDS

Suicidal ideation in the preceding year was reported by 8.8% ($n = 48$; 95% CI: 6.70–11.50) of participants, and 3.1% (17, 95% CI 2.00–5.00) had attempted suicide in the same year and 3% ($n = 16$) had attempted suicide at some other time in their life. In total, 10% of the study participants ($n = 54$; 95% CI: 5.00–15.00) met the criteria for suicidality as defined in this study (either had suicidal ideation in the last year or attempted suicide in one's life time). Of those with suicidal ideation in the previous year, one-third of them (33%) had also attempted suicide.

Clinical factors and suicidality in HIV/AIDS

Seventy-six per cent ($n = 413$) of the participants had reported excellent or good physical health in the past 3 months and 8% ($n = 45$) had to cut down on activities because of physical illness. There was no significant difference between the two sites in terms of clinical conditions associated with HIV/AIDS. According to the WHO clinical staging of HIV, 83% ($n = 452$) were in stages I and II, 13% ($n = 70$) were in stage III and 4% ($n = 21$) in stage IV. According to the participants most recent CD4 cell counts, 16% ($n = 89$) had 0–200 cells/ μ L, 45% ($n = 244$) had 201–500 cells/ μ L, 23% ($n = 127$) had ≥ 501 cells/ μ L, while 15% ($n = 83$) had never had their CD4 counts done. Seventy percent ($n = 382$) were on antiretrovirals (ARVs) and 30% ($n = 161$) were ARV naïve.

Relationship between clinical factors and suicidality in HIV/AIDS

Of the clinical factors assessed at bivariate analysis (Table 2), the following were significantly associated with suicidality: perception of poor physical health (OR 2.22, 95% CI 1.23–3.99, $p = 0.007$), physical pain (OR 1.83, 95% CI 1.01–3.30, $p = 0.049$), decreasing their work due to illness (OR = 2.22, 95% CI 1.23–3.99, $p = 0.004$) and duration of HIV infection (those newly infected having higher proportions with suicidality than those who had lived longer with the infection) (OR 1.02, 95% CI 1.01–1.03, $p = 0.001$). The clinical factors not significantly associated with suicidality were: symptoms of diarrhoea, weight loss, Kaposi sarcoma, unexplained fevers, oral thrush, herpes zoster, memory problems, lymphadenopathy, chronic cough and skin rash. Other clinical factors not associated with suicidality in this study were being on ARVs, HIV stage and CD4 cell count. Clinical factors that were significantly associated with suicidality at bivariate analysis were included in the model for the subsequent analysis. In the final logistic regression analysis, none of the clinical factors remained statistically significant.

Discussion

The goal of this study was to investigate HIV/AIDS related clinical factors associated with suicidality among HIV-positive persons attending two HIV clinics in Mbarara

Table 1: Demographic characteristics by gender July–October 2009 ($N = 543$)

Variable	Female <i>n</i> (%)	Male <i>n</i> (%)	Total <i>N</i> (%)
District			
Mbarara	256 (62.1)	76 (58.8)	332 (61.1)
Isingiro	77 (18.7)	27 (20.6)	104 (19.2)
Bushenyi	32 (7.7)	13 (9.9)	45 (8.3)
Ntungamo	19 (4.6)	1 (0.8)	20 (3.7)
Other	28 (6.8)	14 (10.1)	42 (7.7)
Study site			
ISS Clinic	231 (56.1)	73 (55.7)	304 (56.0)
TASO Clinic	181 (43.9)	58 (44.3)	239 (44.0)
Age			
Adolescents (15–19)	11 (2.7)	3 (2.3)	14 (2.6)
Young adults (20–34)	178 (43.2)	40 (30.5)	218 (40.1)
Middle age (35–59)	216 (52.4)	83 (61.1)	299 (55.1)
Elderly (60+)	7 (1.7)	5 (6.1)	12 (2.2)
Tribe			
Munyankore	322 (78.2)	101 (77.1)	423 (77.9)
Mukiga	38 (9.2)	13 (9.9)	51 (9.4)
Muganda	28 (6.8)	5 (3.8)	33 (6.1)
Other	24 (5.8)	12 (9.2)	36 (6.6)
Religion			
Anglican	202 (49.0)	71 (58.8)	273 (50.3)
Catholic	132 (32.0)	43 (32.8)	175 (32.2)
Saved	37 (9.0)	8 (6.1)	45 (8.3)
Moslem	37 (9.0)	8 (6.1)	45 (8.3)
Other	4 (1.0)	1 (0.8)	5 (0.9)
Marital status			
Never married	41 (10.0)	22 (16.8)	63 (11.6)
Married/cohabiting	139 (33.7)	84 (64.1)	223 (41.1)
Widowed/separated/ divorced	232 (56.3)	25 (19.1)	257 (47.3)
Level of education			
Primary or no formal education	310 (75.2)	78 (59.5)	388 (71.5)
Secondary or higher education	101 (24.8)	53 (40.5)	154 (28.5)
Employment			
Formal employment	124 (30.1)	45 (34.4)	169 (31.1)
Peasant	207 (50.2)	53 (40.5)	260 (47.9)
Home maker	13 (3.2)	1 (0.8)	14 (2.6)
Other jobs	29 (7.0)	26 (19.9)	55 (10.1)
Unemployed	38 (9.2)	5 (3.8)	43 (7.9)
Total	412 (100)	131 (100)	543 (100)

Table 2: Relationship between clinical factors and suicidality in HIV-infected patients at two HIV clinics in Mbarara district July–October 2009 (*N* = 543)

Variable	Frequency <i>n</i> (%)	Suicidal <i>n</i> (%)	Non-suicidal <i>n</i> (%)	ORs (95% CI)	<i>P</i> -value	Adjusted ORs (95% CI)	<i>P</i> -value
Perception of physical health							
Good	413 (76.1)	33 (8.0)	380 (92.0)	1 (Reference)			
Poor	130 (23.9)	21 (16.2)	109 (83.8)	2.22 (1.23–3.99)	0.007*	1.87 (0.90–3.88)	0.091
Physical pain							
Pain absent	404 (74.4)	34 (8.4)	370 (91.6)	1 (Reference)			
Pain present	139 (25.6)	20 (14.4)	119 (85.6)	1.83 (1.01–3.30)	0.049*	0.98 (0.78–1.24)	0.866
Duration of HIV							
Up to 1 year	514 (94.7)	44 (9.0)	470 (91.0)	0.21 (0.06–0.71)	0.012	0.42 (0.24–0.73)	0.002*
1 to 5 years	13 (2.4)	4 (31.0)	9 (69.0)	1 (Reference)			
More than 5 yrs	16 (2.9)	6 (38.0)	10 (62.0)	1.35 (0.29–6.38)	0.705		
Weight loss							
No weight loss	441 (81.2)	35 (7.9)	406 (92.1)	1 (Reference)			
Weight loss present	102 (18.8)	19 (18.6)	83 (81.4)	0.38 (0.21–.69)	0.003*	0.54 (0.28–1.05)	0.071
Fever							
Yes	130 (23.9)	20 (15.4)	110 (84.6)	0.49 (.27–.89)	0.028*	0.66 (0.35–1.24)	0.203
No	413 (76.1)	34 (8.2)	379 (91.8)	1 (Reference)			
Memory problems							
Yes	80 (14.7)	13 (16.3)	67 (83.7)	0.50 (0.26–0.98)	0.041*	0.67 (0.33–1.37)	0.268
No	463 (85.3)	41 (8.9)	422 (91.1)	1 (Reference)			
Kaposi sarcoma							
Yes	20 (3.7)	5 (25.0)	15 (75.0)	0.31 (0.11–0.89)	0.022*	0.50 (0.16–1.66)	0.249
No	423 (96.3)	49 (11.6)	474 (88.4)	1 (Reference)			
Reduced activity due to illness							
Yes	45 (8.3)	10 (22.2)	35 (77.8)	0.34 (0.16–0.73)	0.004*	0.44 (0.19–1.03)	0.059
No	498 (91.7)	44 (8.8)	454 (91.2)	1 (Reference)			

*Denotes statistical significance

municipality, south-western Uganda. The prevalence of suicidality was found to be 10% of the study population. This may be considered as a fairly high rate whose importance is due to the increased risk of repetition in attempters and their greater risk of an eventual death by suicide (Ferreira et al., 2015). Although perceived poor physical health, physical pain, duration of HIV infection and decreasing work due to illness were significantly associated with suicidality in bivariate analysis, none of these factors remained statistically significant in the final logistic regression. In HIV infection and AIDS, many factors contribute to the increased risk for suicidality. There is no single clinical factor or physical symptom that can by itself significantly increase the risk of suicidality.

Participants who reported that their physical health was poor or very poor in the past three months had higher odds for suicidality. This negative perception about their physical health could also be associated with other factors, such as depression, anxiety and other physical conditions (Qin, Hawton, Mortensen, & Webb, 2014; Rukundo, Mishara, & Kinyanda, 2016; Van Orden et al., 2015; Waern et al., 2002). Previous studies have reported higher rates of suicidality in physical illness, but not necessarily among the severely ill (Kaplan et al., 2007; Qin et al., 2014). In our study, significant weight loss, unexplained fevers, Kaposi sarcoma and memory problems were associated with lower odds for suicidality in the study population. These clinical features could easily be associated with other medical conditions that require attention and care. It is possible that individuals

with these symptoms received care from other people and they were not stigmatised or abandoned as much as people with depression who look healthy. In addition, people who are severely ill may not be strong enough to execute a suicide plan. However, these findings are not in agreement with some of the previous studies which have found a significant association between severe physical illness and increased risk for suicide (Waern et al., 2002; Webb et al., 2012). These differences may be due to differences in the study populations and methodological differences in how physical illness and suicidality were measured.

Physical pain was also associated with higher odds for suicidality. This is consistent with findings in previous studies which have reported higher suicidality in illnesses associated with pain and shame (a component of psychological pain). Pain is associated with hopelessness and increased fear of the future, which is an indication of increased risk for suicidality. Previous studies have also associated suicidality with memory problems. For example, Alfonso and Cohen (1994) reported that memory problems are associated with impulsivity, lability of mood and impaired judgment, which in turn increase the risk for suicidality. We found that although memory problems and other physical disorders were associated with suicidality, none of them could independently predict suicidality (Carrico et al., 2007).

A substantial number of the study participants, 15% (*n* = 83) did not know their CD4 count results because they had either just joined the clinics or were still waiting for the results to be processed. As a result, these people had not

started taking anti-retroviral therapy. At the time of the study, the CD4 cell count results would take a long time due to lack of machines at the facilities. We found no significant association between CD4 cell count and suicidality. However, previous studies have reported low CD4 cell count as a high risk factor for psychiatric disorders and suicidality (Cooperman & Simoni, 2005). This difference could be due to other factors, such as the increased social support provided at the study sites.

Conclusion

HIV/AIDS is still associated with a considerable burden of suicidality in south-western Uganda. No single clinical factor could independently predict suicidality in HIV/AIDS. Multiple factors work together to increase vulnerability to suicidality. Holistic care that includes suicide risk assessment and management should be adopted while caring for people living with HIV/AIDS.

Limitations

This being a cross-sectional study, the nature of the causal relationships between suicidality and the factors we investigated could not be determined. Also, individuals younger than 15 years were excluded from the study to avoid difficulties of using adult tools which have not been validated with children. Hence, a significant number of persons with HIV/AIDS were not included, and we cannot know if our results would be the same in younger age groups. Third, the presence of other illnesses, such as diabetes and hypertension, and their associated symptoms could confound the associations with HIV/AIDS which we observed.

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