A study on prevalence and correlates of depression among women living with human immunodeficiency virus/acquired immune deficiency syndrome in North Karnataka

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Context: Depression is the most prevalent psychiatric condition seen in human immunodeficiency virus (HIV)-positive individuals. Various biological, sociocultural, and economic factors make women more vulnerable to HIV and acquired immune deficiency syndrome (AIDS). Depression affects medication adherence and immunity against HIV thus contribute significantly to disease progression. Aims: The aim is to assess the prevalence, sociodemographic, and clinical correlates of depression among women living with HIV/AIDS. Settings and Design: Antiretroviral therapy (ART) centre attached to government medical college hospital in North Karnataka and cross-sectional design. Materials and Methods: This study was conducted among 145 women living with HIV/AIDS, depression was assessed using Beck Depression Inventory, and social support was assessed using Lubben Social Network Scale and quality of life (QoL) using the World Health Organization QoL BREF scale. Statistical Analysis Used: Data were analyzed using Statistical Package for the Social Sciences version 20.0. Chi-square test with \( P \) value less than 0.05 was taken as statistically significant. Results: Among 145 HIV-positive women, 50 (34.5\%) were depressed. Depression was statistically significant in women from rural background. Significant association between depression and risk of social isolation was observed. Scores of all domains of QoL, that is, physical, psychological, social, and environmental were reducing with increase in the severity of depression indicating that QoL was decreasing with increase in severity of depression. Among the four domains, social domain was the most affected. Conclusions: Depression among women living with HIV/AIDS which is underdiagnosed and undertreated. Depression negatively impacts adherence and immunity leading rapid progression of the infection. Therefore, early diagnosis and treatment of depression are essential.

Keywords: Acquired immune deficiency syndrome, depression, human immunodeficiency virus, quality of life, social support, women

Although the prevalence of human immunodeficiency virus (HIV) infection/acquired immune deficiency syndrome (AIDS) is declining, the number of persons suffering from it is staggering. India has third highest number of people living with HIV/AIDS (PLWHA) in the world. There are around 2.1 million PLWHA in India and women account for 36\% (0.75 Million).\[1\] Karnataka has 209,366 PLWHA\[2\] and districts in North Karnataka have high prevalence of HIV infection.\[3\]

Biological, sociocultural, and economic factors make women more vulnerable to HIV. In India, the low social status of women, poverty, early marriage, trafficking,
sex-work, migration, lack of education, and gender discrimination are some of the factors responsible for increasing the vulnerability of women to HIV infection. Women seem to bear disproportionate psychological, social, and economical burden of this epidemic.[8]

Depression is the most common psychiatric condition seen in PLWHA. Factors which could trigger depression among PLWHA are stress, difficult life events, side effects of medications, or the effects of HIV on the central nervous system.[9] The financial burden of treatment of HIV/AIDS and associated conditions is immense, often landing the sufferer and his family reeling in poverty. At times, this leads to abandoning by family, broken homes, loss of employment, and sale of assets to pay for treatment. The stigma attached to the disease is often a leading cause of patient landing up with severe depression.[10]

Depression negatively affects the immune response against HIV infection.[11] Components of human immune system which play a major role in response against HIV infection, namely, CD4, CD8, T-lymphocytes, and natural killer cells are also affected by depression.[12] Many studies have shown rapid fall in CD4 and CD8 T-lymphocytes,[13,14] and thus rapid progression to the AIDS stage or death in depressed HIV-positive persons.[15,16]

Depression is associated with poor medication adherence, which can result in medication-resistant strains of HIV, declining CD4 count and increased viral load. The national guidelines in India stipulate >95% adherence to ART. Depression has been shown to be an independent predictor of poor adherence in other studies.[17]

There are several barriers to the diagnosis of depression in PLWHA as somatic symptoms such as fatigue, weight loss, and loss of appetite and poor concentration may complicate the differential diagnosis in physically ill HIV-infected individuals.[18]

Women with HIV infection in India face higher caregiver burden, more stigma and poor health care, which probably contribute to the higher prevalence of depression among them.[19] Depressive symptoms in HIV-positive women are associated with less social support, and a worse quality of life (QoL), decreased adherence to ART, higher viral loads, and higher mortality.[20]

In this study, we have made an attempt to assess the prevalence, sociodemographic correlates of depression such as social support and QoL among women living with HIV/AIDS. This in return would help in designing programs for the prevention, early diagnosis, and treatment of depression among women living with HIV/AIDS.

**SUBJECTS AND METHODS**

This study was conducted for 6 months, that is, from May 2015 to October 2015 among women living with HIV/AIDS attending the antiretroviral therapy (ART) centre attached to a government medical college in North Karnataka.

**Method of data collection**

The sample size was determined by calculation based on the prevalence of depression among HIV-positive women in the previous studies. In the previous studies, the prevalence was found to be around 45%, with confidence limit of 95% the sample size was around 145 with allowable error 8%.

HIV-positive women between the age 18–45 years, who have been diagnosed with HIV and informed about their status at least 3 months before the study and who were willing to participate in the study with a written informed consent were included in the study.

Women with significant acute systemic illness, previous history of psychiatric illness and current substance/alcohol abuse or dependence (as per the Diagnostic and Statistical Manual of Mental Disorders fifth edition [DSM-5] criteria), pregnancy, and nursing mothers were excluded from the study:

A total of 145 patients were recruited over 6 months and then subjected to evaluation for inclusion into the study after fulfillment of both inclusion and exclusion criteria.

This study was approved by Institutional Ethics Committee. The HIV-positive female patients were selected to participate in the study on their arrival at the ART centre for monthly medications and follow-up. Patients who attended the ART centre, by order of arrival, were invited to participate in the interview. The procedure was clearly explained to them in their local language, and all aspects of confidentiality were reassured.

All study procedures, as well as the related ethical aspects, such as professional privacy safeguards and psychiatric follow-up in case of referral for psychiatric treatment, were explained to participants, all of whom gave written informed consent. The clinical treatment of those who declined to participate in the study was not affected in any way.

The interviews were conducted in a separate consultation room. Each interview lasted for an average of 60–70 min. In the case of a patient feeling tired or uncomfortable, she was allowed to take a break following which she could
resume. Participants diagnosed with depression were treated at department of psychiatry later, and appropriate treatment was provided individually.

The data were collected by a pretested semi-structured questionnaire. Tools used were
1. Modified Kuppuswamy’s social status scale[17]
2. DSM-5[18]
3. Severity of depression was assessed using Beck’s Depression Inventory (BDI)[19]
4. Lubben Social Network Scale[20]
5. World Health Organization QoL-BREF scale.[21]

**Beck Depression Inventory Scale**
BDI scale was used in this study to measure depressive symptoms. BDI is a self-reporting instrument and contains 14 cognitive/affective items and 7 somatic items. Individuals are asked to rate themselves on a zero-to-three spectrum with a score range of 0–63, total score is a sum of all items. Each question is designed to assess a specific symptom common among people with depression. Scores from 0 to 9 were considered as normal, 10–16 as mild depression, 17–29 as moderate depression, and 30–63 as severe depression.

**Lubben social network scale**
It is a self-report 10-item scale to assess the level of social support available to a person. Each item is rated from zero to five. It has five domains including family network, friends’ network and confidant relationship, helping others, and living arrangements. The minimum score is zero and maximum is 50, higher scores indicating greater level of social support. Scores <20 was considered as isolated, scores between 21 and 25 as high risk for isolation, 26–30 as moderate risk for isolation, and scores more than 31 as low risk for isolation.

**World Health Organization Quality of Life-BREF scale**
QoL was measured using the World Health Organization BREF scale with 26 items.[11] This instrument has 4 domains (physical, psychological, social, and environmental). Each domain has questions covering various aspects of the respective domain.

There are also two items examined separately; one about the individual’s overall perception of QoL and the other about the individual’s overall perception of his or her health. Each item uses a five-point Likert-type scale. The domain scores were scaled in a positive direction, implying that higher the score, higher the QoL.

A total score for each domain and an overall QoL score were calculated. The raw scores were transformed to 0–100 scale.

**Statistical analysis**
Categorical data were represented in the form of frequencies and proportions. Chi-square was used as test of significance. Continuous data were represented as mean and standard deviation. Independent t-test was used as test of significance to identify the mean difference between two groups and analysis of variance was the test of significance to identify the mean difference between more than two groups. P < 0.05 was considered as statistically significant.

Data were analyzed using Statistical Package for the Social Sciences (SPSS) for Windows, Version 20.0., Armonk, NY: IBM Corp.

**RESULTS**
Majority of the participants (55.9%) belonged to the age group of 35–45 years which is productive population. In total, 83 (57.2%) women were widowed and 51 (35.2%) were married. About 82.2% (120) women were on ART and women with CD4 count more than 350 were 60% (87). There was no statistically significant association found between marital status, religion, and depression. There was no statistically significant association of CD4 count, ART status of the patient with depression. The majority (55.2%) of the women belonged to upper-lower socioeconomic class according to the modified Kuppuswamy’s classification.[17] There was no significant association between socioeconomic status and occupation with depression.

Among 145 HIV-positive women, 50 (34.5%) had clinical depression. Among depressed participants, 27 (54%) had mild, 21 (42%) moderate, and 2 (4%) had severe depression. Out of 145 participants, 50 were depressed, and among depressed, 29 (58%) were from rural and 21 (42%) were from the urban area. Rural women were more depressed than urban women, and it was statistically significant.

As it is seen in Table 1, 6 (4.1%) study participants were socially isolated, 63 (43.5%) had moderate-to-high risk for isolation, and 76 (52.4%) of the women had low risk for isolation. Twenty-two (44%) of depressed women had low risk for isolation, 23 (46%) had moderate-to-high risk for isolation, and 5 (10%) were isolated. There was a statistically significant association of social support with depression and its severity [Table 2]. Risk of isolation was low in the majority of the patients without depression.

The distribution of depression by different domains of QoL is presented in Table 3. Significant mean difference was observed for all the domains of QoL between depressed and nondepressed participants and also with respect to severity of depression. Scores of all domains
of QoL were higher in nondepressed participants than depressed subjects indicating that QoL was lower in depressed participants [Table 3]. Scores of all domains of QoL were reducing with increase in severity of depression indicating that QoL was decreasing with increase in severity of depression. Among all domains, social domain was the most affected component of QoL in our study participants [Table 3].

**DISCUSSION**

We assessed depression by BDI scale, and the prevalence was found to be 34.5% [Table 1]. Among 50 participants with depression, 54% had mild depression, 42% had moderate depression, and 4% had severe depression. This is in accordance with the prevalence rate of depression noted in the previous studies by Unnikrishnan et al. (37%), Jagannath V et al. (43%), and Naik et al. (46.99%). However, there are studies which have reported a lower and few others a higher prevalence rate of depression among HIV-positive women. It is essential to observe that studies that use the more strict DSM criteria report lower prevalence rates than which use the International Classification of Diseases-10 criteria. Furthermore, other studies have elucidated the underreporting of prevalence rates of depression in HIV-positive patients, and social stigma may be a contributing factor.

In our study, rural women were found to be more depressed than urban women. This may be because of nonavailability of health care and social services to rural women. The conservative society in rural areas forces them not to disclose their HIV status, thus depriving them of the social support and ultimately leading to depression.

There was no significant association of depression with religion, marital status, socioeconomic status, education, occupation, CD4 count, and duration of ART of respondents. Almost similar results have also been found

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**Table 1: Assessment of depression and social support**

| Parameters | n (%) |
|------------|-------|
| Depression |       |
| Not depressed (BDI score 0-9) | 95 (65.5) |
| Depressed (BDI score 10-63) | 50 (34.5) |
| Severity |       |
| Mild | 27 (54) |
| Moderate | 23 (42) |
| Severe | 2 (4) |
| Social support |       |
| Isolated (LSNS score <20) | 6 (4.1) |
| High risk for isolation (LSNS score 21-25) | 11 (7.6) |
| Moderate risk for isolation (LSNS score 26-30) | 52 (35.9) |
| Low risk for isolation (LSNS score 31) | 76 (52.4) |

BDI – Beck’s Depression Inventory; LSNS – Lubben Social Network Scale

**Table 2: Association between depression and risk of isolation**

| Risk of isolation | Depression | P |
|-------------------|------------|---|
| Present, n (%) | Absent, n (%) | |
| Low | 22 (44) | 54 (58.6) | 0.024 |
| Moderate | 17 (34) | 35 (36.8) |
| High | 6 (12) | 5 (5.3) |
| Isolated | 5 (10) | 1 (1.1) |

| Risk of isolation | Depression | P |
|-------------------|------------|---|
| Mild, n (%) | Moderate, n (%) | Severe, n (%) | |
| Low | 15 (55.6) | 7 (33.3) | 0 | 0.003 |
| Moderate | 9 (33.3) | 7 (33.3) | 1 (50) |
| High | 2 (7.4) | 4 (19) | 0 |
| Isolated | 1 (3.7) | 3 (14.3) | 1 (50) |

**Table 3: Mean scores of domains of quality of life with respect to depression status**

| Domains of QoL | Depression |       |
|----------------|------------|-------|
| | Present | Absent | P |
| | Mean | SD | Mean | SD | |
| Physical | 47.50 | 12.47 | 59.83 | 12.61 | <0.001* |
| Psychological | 45.72 | 14.83 | 62.40 | 13.91 | <0.001* |
| Social | 29.14 | 15.62 | 41.37 | 19.61 | <0.001* |
| Environmental | 65.26 | 12.05 | 71.38 | 12.13 | 0.004* |

| Domains of QoL | Severity of depression |       |
|----------------|------------------------|-------|
| | Mild | Moderate | Severe | P |
| | Mean | SD | Mean | SD | Mean | SD | |
| Physical | 53.85 | 11.17 | 40.29 | 9.78 | 37.50 | 9.19 | <0.001* |
| Psychological | 53.96 | 11.56 | 37.10 | 12.21 | 25.00 | 8.49 | <0.001* |
| Social | 36.15 | 16.29 | 21.71 | 9.84 | 12.59 | 9.19 | <0.001* |
| Environmental | 68.22 | 13.23 | 62.29 | 9.74 | 56.50 | 9.19 | 0.007* |

*P<0.05, QoL – Quality of life; SD – Standard deviation
in other studies.[31,32] More planned studies with sufficiently large samples, however, are needed to examine such hypotheses.

There was a significant association between risk of isolation and depression and its severity among HIV-positive women. Risk of isolation was low in the majority of participants without depression [Table 1]. These findings in our study are similar to the results of the previous studies[33,34] which observed a low prevalence of depression in HIV-positive participants having a good social support as compared to those patients having low social support, and higher social support was associated with lower depression and higher QoL.

Our study observed that there was a significant negative correlation between BDI score and all the QoL domains in study participants, that is, with increase in BDI score there was decrease in QoL scores and vice versa. Hence, QoL is significantly poor among depressed HIV-positive women [Table 3]. Among all the domains, social domain was the most affected component of QoL. This is in keeping with the observations made in the previous studies.[33,34]

Social domain of QoL involves personal relationships, social support, and sexual activity. Charles et al.[35] observed that QoL was markedly affected in social domain (poor QoL 51.2%) as compared to other domains such as physical (42.5%), psychological (40%), and environmental (34%). Some other studies also reported poor QoL in different domains.[35]

As depression affects many domains of the QoL, depressed individuals present with significant impairment in QoL and physical and mental functioning.[36] Therefore, depression is one of the strongest predictors of lower QoL of people with HIV/AIDS. Depression has a negative impact on all the dimensions of QoL studied, in addition to being associated with poor adherence to the antiretroviral treatment[37] and a greater perception of the stigma associated with HIV.[33]

**CONCLUSIONS**

The prevalence of depression among women living with HIV is high, and also, it is underdiagnosed and undertreated. Depression negatively impacts QoL, medication adherence, and immunity leading rapid progression of HIV infection. Therefore, early diagnosis and treatment of depression among HIV-positive women become essential. There is a need to incorporate mental health services as an integral component of HIV care.

**Limitations**

As the sample was derived from tertiary care set up, generalization of the results may be limited and as our study is cross-sectional, it is difficult to prove causal relationships between depression, social support, and QoL. In addition, as only women living with HIV/AIDS aged between 18 and 45 years, who provided informed consent and were not too sick to answer the questions were included in the study, our findings may not represent the entire cohort of women living with HIV/AIDS in the region. Furthermore, our study did not include control group. Other limitations are convenience sample and self-report measures.

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**Conflicts of interest**

There are no conflicts of interest.

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