

# Suicidal behaviour in HIV-infected patients in Greece

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## SUMMARY

This study investigated suicide completion and suicide attempts by HIV-infected patients in Greece, which, from the existing literature, are more frequent than those among the general population. The study sample comprised HIV-infected patients who had been monitored for a minimum period of six months from 1992 through 2012 at the "Andreas Sygros" University Hospital in Athens. Among the 1884 patients who were monitored during the study period, 37 suicides were attempted by 28 (1.48%) patients (27 men and 1 woman). Six of them were fatal (0.3%, 52/100,000 person-years) while over the study, 397 patients died. No significant differences concerning main characteristics were recorded among patients

with an attempted and those with a completed suicide. Seventeen of the 28 patients (60.71%) demonstrated psychiatric morbidities. Suicide attempts were more numerous before the advent of combined antiretroviral therapy (cART), whereas there was no difference in attempts before and after the Greek financial crisis in 2009. The suicide frequency was higher than that of the general population for the same period. However, it decreased after the introduction of cART. Special attention is required in recording coexisting mental disorders and providing specialized psychiatric care to HIV-infected patients.

*Keywords:* HIV, suicide, behaviour, Greece.

## INTRODUCTION

Suicidal behaviour includes attempted suicide, which represents a self-destructive act with the intent to end one's life, and completed suicide, which is the extreme end of this intent [1, 2]. The World Health

Organization reported that suicide is among the three leading causes of death of those aged 15-44 years worldwide (both sexes). Moreover, for every suicide, there are many more people who attempt suicide each year [3].

In European Union countries in 2013, there were on average 11.7 deaths from suicides per 100,000 inhabitants. Suicides rates were the highest in Eastern Europe and the lowest in Southern Europe [4].

Greece has one of the lowest standardized death rates from suicide in Europe.

Infection from the human immunodeficiency virus (HIV) is a chronic disease and the maintenance of a good quality of life is of major concern to these patients. Their mortality has considerably decreased and it is attributed mainly to non-acquired-immune-deficiency-syndrome (AIDS) causes. Moreover, after the introduction of combined antiretroviral therapy (cART), hepatic disease, non-HIV related malignancies, and cardiovascular conditions represent the main causes of death [5, 6].

The suicide rate of HIV-infected patients is reported to be higher than that of the general population [7-9]. Studies have been conducted evaluating the suicide rate of HIV-infected patients; however, the variations have been high ranging from 2.4% to 30% [10,11]. Therefore, this study examined the characteristics of HIV-infected patients and their rate of both suicide attempts and suicide completion.

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## ■ PATIENTS AND METHODS

In Athens, HIV care is assigned to few specialized centers. The HIV-infected population in Athens' area is constituted mainly by white men who acquired HIV by having sex with other men. One of the largest centers is the HIV/AIDS unit of "Andreas Sygros" University Hospital, specializing in dermatological and venereal diseases. The unit has provided in- and out-patient care and follow-up care to approximately 2500 HIV-infected patients during the last twenty-eight years.

In this study, data concerning suicide attempts and completion were collected from patients' files. Patients who were monitored for more than 6 months from 1992 through 2012 were included in this study. The cause of death was confirmed by death records and interviewing relatives of the deceased. Patients who survived the attempt were also interviewed. Patients' clinical and socio-demographic characteristics were also collected. Data analysis included an examination of suicide attempts and completion incidence. Statistical analysis was conducted using GraphPad Prism version 5.00. Data were tested for normality; in cases of normal data, analysis was based on parametric tests (reporting mean  $\pm$  standard deviation), while in cases of non-normal data, non-parametric tests were used (reporting median  $\pm$  interquartile range). The level of significance that was used to determine statistical significance was less than 5%.

## ■ RESULTS

Patients (n=1884 patients, 1631 men) who were followed-up with between 1992 and 2012 participated in this study. The median monitoring time was 6.1-years. Twenty-eight patients (1.48%) executed 37 suicide attempts, six of whom were successful (0.3%), rate 52/100,000 person-years. The total number of patients who died in the study period were 397. Suicide represented 1.51% (6/397) of the causes of death.

The demographic and clinical characteristics of the 28 patients who attempted suicide is presented in Table 1.

Although the clear majority of the patients attempting suicide were men (27/28, 96%) there was no statistically significant difference in the

relative frequency of suicide attempts between men (27/1631, 1.65%) and women (1/253, 0.39%,  $p=0.16$ ).

The mode of HIV transmission was through sexual intercourse for all 28 patients (100%); all men were homosexual (96%) and the only woman (4%) was heterosexual and was infected by her husband.

Twenty patients (71.4%) attempted suicide once, seven (25%) attempted suicide twice, and one (3.6%) attempted suicide three times. Of the 28 patients attempting suicide, 6 died (21.4%). Seventeen (60.71%) had a psychiatric co-morbidity and were receiving therapy. Specifically, among the suicide survivors 14 had a psychiatric co-morbidity: 8 had depression, 4 had bipolar disorder, and 2 had anxiety disorder. Among the patients who committed suicide, 2 had depression, and 1 had bipolar disorder. Nine patients of the 28 (32%) had attempted suicide before their HIV diagnosis.

**Table 1** - Characteristics of HIV- patients who attempted suicide (NO=28).

<i>Age (years)</i>	36.64 $\pm$ 8.66
<i>Gender, n</i>	
Male	27
Female	1
CD4 T-cells (cells/mm <sup>3</sup> )	498 $\pm$ 253.24
HIV RNA (copies/ml)	28.522 $\pm$ 114.211
HAART, No.	21 (75%)
<i>CDC stage, n</i>	
A	8 (28%)
B	7 (25%)
C	13 (46%)
Hepatitis B, C co-infection, n	3 (11%)
Co-occurring psychiatric conditions, n	17 (61%)
<i>Family status</i>	
married	4 (14%)
having children	2 (7%)
<i>Educational level</i>	
none	1 (4%)
primary	9 (32%)
secondary	14 (50%)
tertiary	4 (14%)
<i>Monthly income</i>	
low	3 (11%)
median	21 (75%)
high	4 (14%)

Note. Categorical variables are shown as numbers [percentages] and continuous as means ( $\pm$ Standard Deviation).

Twenty-one patients (75%) were taking antiretroviral therapy: 13 were receiving protease inhibitors (PIs) based regimens (ritonavir, lopinavir/ritonavir, fosamprenavir, atazanavir, darunavir), 6 were receiving non-nucleoside reverse transcriptase inhibitors (NNRTIs) based regimens (nevirapine, etravirine) and 2 patients were under abacavir/lamivudine/zidovudine. A variety of nucleoside/nucleotide reverse transcriptase inhibitors (NRTIs) were used as backbone. None of the patients were receiving efavirenz.

There were no statistically significant differences ( $p > 0.05$ ) between the patients who attempted suicide ( $n=22$ ) and those with completed suicide ( $n=6$ ) nor between those who attempted suicide once ( $n=20$ ) or more than once ( $n=8$ ) (Table 2).

Moreover, the distribution of suicide attempts and deaths per year is presented in Figure 1.

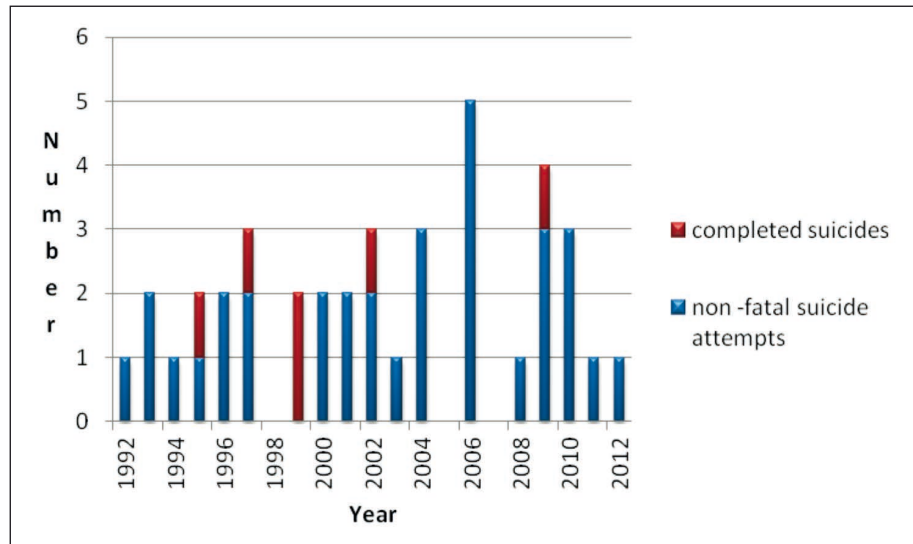
Suicide attempts were more frequent before the introduction of cART than after cART was implemented (79/100,000 person years (py) vs 24/100,000 py). Furthermore, the 2009 economic crisis in Greece did not seem to increase suicide frequency (27/100,000 py before vs 17/100,000 py after 2009). Many factors triggered suicide attempts: 15 (38.5%) were related to rejection from their partner; eight (20.5%) were related to HIV-diagnosis; four (10.2%) were related to affection with Kaposi sarcoma; two (5.1%) were related to domestic violence; two (5.1%) were related to manipulation; one (2.5%) was related to financial problems; and the rest (18%) were related to social rejection, suicide of a family member, or joining the army. One patient attempted twice due to financial problems. All patients suffering from Kaposi sarcoma were successful at commit-

**Table 2 - Patients' characteristics according to completed/attempted suicide and one/more suicide attempts.**

	Patients with completed suicide (death) No=6	Patients who attempted suicide No=22	p-value	Patients attempted suicide once No=20	Patients attempted suicide more than once No=8	p-value
Age (years)	36.06± 9.08	38.83±6.71	0.48	37.56±9.26	35.92±7.97	0.49
Gender, n						
Male	6	21		20	7	
Female	0	1		0	1	
CD4 T-cells (cells/mm <sup>3</sup> )	300.83±266.38	476.84±259.04	0.13	459.94±312.63	439.25±220.74	0.81
HAART, n	4(66%)	17(77%)	0.59	15(75%)	5(62%)	0.51
CDC stage, n						
A	1 (16%)	7 (32%)	0.46	10 (50%)	4(50%)	
B	1(16%)	6(27%)	0.59	6(30%)	2(25%)	0.79
C	4(66%)	9(41%)	0.26	5(25%)	2(25%)	0.62
Hepatitis B, C co-infection, n	1(16%)	2(9%)	0.59	2(10%)	1(12%)	0.84
Co-occurring psychiatric conditions, n	3(50%)	14(63%)	0.54	11(55%)	6(75%)	0.32
Family status						
married	0(0%)	4(18%)	0.21	4(20%)	0(0%)	0.08
Having children	0(0%)	2(9%)	0.48	2(10%)	0(0%)	0.23
Educational level						
none	0(0%)	1(4%)	0.51	0(0%)	1(12%)	0.11
primary	2(33%)	7(32%)	0.85	7(35%)	3(37%)	0.15
secondary	3(50%)	11(50%)		9(45%)	4(50%)	0.81
tertiary	1(16%)	3(13%)		4(20%)	0(0%)	0.08
Monthly income						
low	1(16%)	2(9%)	0.54	2(10%)	1(12%)	0.30
median	4(66%)	17 (77%)	0.59	15(75%)	5(62%)	0.78
high	1(16%)	3(13%)	0.85	3(15%)	1(12%)	0.86

Note. Categorical variables are shown as numbers (percentages) and continuous as means (± Standard Deviation).

**Figure 1** - Suicides attempts and deaths distribution per year.



ting suicide, while 3 of them had no psychiatric co-morbidity.

The mean time between diagnosis and suicide attempt was  $3.5 \pm 2$  years, while seven patients (25%) attempted suicide immediately after HIV diagnosis.

Among the methods used to commit suicide, the most common was poisoning (79.5%): using drugs ( $n=24$ ), narcotics ( $n=4$ ), cleanser ( $n=2$ ) and pesticide ( $n=1$ ); which was followed by more violent methods: hanging ( $n=1$ ), cutting wrists ( $n=3$ ), use of a shotgun ( $n=1$ ), drowning ( $n=1$ ), and jumping from a high height ( $n=2$ ).

## ■ DISCUSSION

### *Suicide rate*

According to European statistics in 2013, the lowest standardized death rates for suicide were reported in Greece (4.8 suicides per 100,000 inhabitants). Relatively low rates (less than 8 per 100,000 inhabitants) were reported in Malta, Cyprus, Italy, and the United Kingdom. The average suicide rate in Europe in 2013 was 11.7 suicides per 100,000 inhabitants [4].

Studies addressing HIV-infected patients, such as this study, although they have heterogeneity, reported much higher suicide rates. Inconsistent results are due to different methodologies on sampling and suicide assessment [12].

In the Swiss cohort study, which was conducted between 1988 and 2008, 15,275 HIV-infected patients were monitored for a median duration of 4.7 years and 150 completed suicides were reported (0.98%, 158.4/100,000 py) [7]. Furthermore, an analysis of the published suicide and HIV data (66 studies) concluded that 2.4% of HIV-infected participants commit suicide [10]. Additional studies have reported much higher percentages of suicide attempts by HIV-infected patients. Badiie et al. evaluated HIV-infected individuals with a comprehensive battery of tests and found that 13% had a lifetime risk of suicide attempts [12]. These results have been reported in both men (30%) and women (26%) in HIV-infected population studies [13, 11].

Higher rates of suicide attempts are also expected as typically suicide attempts are up to 20 times more frequent than completed suicides around the world [3].

Although suicide attempts have a very different psychological background than suicide completions, we did not find any statistical significant difference comparing the characteristics of these two groups. However, this study had a small number of patients in each group.

The reduction in the frequency of suicide attempts after the advent of cART, though not statistically significant, was indicative of the importance of cART and its contribution to the amelioration of patients' quality of life. The results of the Swiss

cohort study were similar: after the introduction of cART in 1996, suicide rates among HIV-infected patients decreased by more than 50% [7].

#### *Deaths*

Suicide accounted for 1.4% of all deaths worldwide, making it the 15th leading cause of death in 2012 [3].

In various studies that have utilized cART data, suicides represented 4-7% of non-AIDS related deaths, while in our study, suicide constituted only 1.51% of the deaths [5, 6, 14]. This may be related to the overall view of suicidal behavioral and life attitude in Greece, which resulted in less deaths from suicide than expected.

In the general population in Greece, the rate of suicide among other death causes was 0.5% in 2012 and 0.49% in 2013 (National Statistical Service of Greece).

#### *Age*

Globally, suicide remains second to only accidental deaths as the leading cause of mortality in young men [15]. The absolute number of suicides is greater in those aged 15-29-years; however, this may be due to the number of people in this age group [16]. In many countries, the rate of suicide is higher in the middle-aged or elderly [15].

Roy et al. (2002) examined the HIV-infected population and found that the mean age of those who attempted suicide was 42.1 years, which was significantly lower than that of HIV-infected patients who had never attempted suicide [17]. Since HIV-infected patients are getting older, it would not be surprising to have changes in the mean age of those attempting suicide.

#### *Risk factors*

Investigation of factors that trigger suicide attempts yielded interesting results. Although HIV on its own causes considerable strain on individuals, it seems that it is not enough to precipitate a suicide attempt.

We found that the most common stressful event was the same as it was for the general population: emotional distress in a relationship. Even so, the role of HIV must not be underestimated. Moreover, all patients who had a Kaposi sarcoma had a successful suicide attempt, thus reflecting the disfiguring and stigmatizing nature of the illness. Socioeconomic factors have been associated with

suicide in the general population as 75% of suicides globally occur in low- and middle-income countries [3]. In addition, in a recent study addressing HIV-infected patients' suicide attempts, the results demonstrate a strong association with socioeconomic factors [18]. Nevertheless, it is interesting that in our study economic crisis played a minor role as there was no increase in the suicide rate after 2009.

Researchers agree that there are many reasons that heighten the suicide risk in HIV-infected patients such as stigmatization, discrimination, lack of social support, rejection, personal regrets, financial worries, cART side effects and toxicity, disfigurement due to lipodystrophy, concerns about sexual intimacy, low levels of coping self-efficacy, and alcohol and substance abuse [10, 13, 19-21, 23].

According to Roy et al. and Carrico, suicidal behaviour encompasses the interaction between distal and proximal triggering factors [17, 20]. The former factors such as family history of suicidal behaviour, childhood emotional abuse and neglect, physical abuse and neglect, and sexual abuse lower the threshold for attempting suicide whereas the latter factors such as depression and neuroticism, precipitate the attempt [13]. We did not dispose a detailed family history of the patients; however, we indeed observed a rather high prevalence of pre-existing psychiatric illnesses (60%). Timely recognition of neuropsychiatric symptoms is important to devise prevention strategies for providing timely care and therapy for co-morbid psychiatric conditions [22].

Carrico et al. observed a marked increase in depression and suicidal ideation shortly after HIV diagnosis and the initiation of health issues as the immune system fails to cope with the infection [21]. In our study, only a small group of patients attempted suicide directly after diagnosis, possibly reflecting strong support between family members in Greece, which helps newly diagnosed patients cope with their disease.

Along with the causes, protective factors were also found in the literature. Identified protective factors against suicidal ideation among HIV-infected patients comprised being in a primary relationship and coping self-efficacy as well as motherhood and spirituality, especially in women [12, 13, 21]. Indeed, only a few of our study participants were married or had children; therefore, they lacked that motive for continuing their lives.

### Methods

It is estimated that around 30% of suicides globally are due to self-poisoning, while hanging and using firearms are other common methods [3]. Indeed, in our study, self-poisoning by drugs was by far the most frequent cause of death reflecting the abundance of available drugs stocked by patients. Therefore, clinicians should be cautious about the type and amount of medications they prescribe to individuals who are at a high risk for suicide. Although self-poisoning is thought to be the easiest and most painless method of committing suicide, it is reported globally that men prefer more violent methods [23].

### HIV-parameters

One of the parameters that has been reported to be related to increased suicidality is a CD4 T-cell count over 200 cells/mm<sup>3</sup> [24]. The mean CD4 count, clinical stage, and viral load observed in our study were consistent with the hypothesis that patients with a more advanced disease are usually more preoccupied with HIV/AIDS health-related conditions and do not have the luxury to premeditate their death even though health deterioration offers an additional motive to end one's life.

The administration of cART is reported to play a positive role by stopping immune activation. Chronic immune activation caused by HIV infection, enhances tryptophan degradation and consequently lowers serotonin levels and induces depressive symptoms. Antiretroviral therapy partly reverses tryptophan degradation offering a protective effect towards suicidal ideation [20]. Moreover, certain antiretroviral regimens such as efavirenz have been accused of increasing the risk of suicide [25]. We did not analyze the possible association between antiretroviral drugs and suicide because of the variety and heterogeneity of cART received. Of note, none of the patients who attempted suicide in this study were receiving efavirenz.

### CONCLUSION

In conclusion, the rate of suicide attempts in HIV-infected patients was higher than the rate that has been reported in the general population; however, the rate has decreased since the intro-

duction of cART. To effectively prevent and manage suicidal behaviour in this high-risk population, it is imperative to recognize neuropsychiatric symptoms, co-morbid psychiatric conditions, dysfunctional partner relationships, other stressors, as well as take note of unsuccessful suicide attempts [25]. Moreover, it is of major importance to provide adequate support and treatment on-site in HIV specialty clinics and routinely subject patients to psychiatric screening and adequate referral in cases of urgently needed intervention.

**Conflict of interest.** The authors have no conflicts of interest to disclose.

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