On the long-term status of treatment-seeking, heroin addicted patients: A 22-year follow-up study on mortality and drug use in Portugal

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Summary

Background: Evidence showed that problematic drug users, in particular heroin users, have a higher risk of re-engagement in drug use and consequent death than the general population. **Aim:** Our aim was to perform a descriptive follow-up analysis to assess mortality and current drug use by reviewing over two decades of treatment admissions. **Methods:** We considered the cohort sample of heroin treatment-seeking patients from 1992 to 2013 that completed the clinical protocol (N= 627 patients). A total of 222 cases (35.4%) of heroin users were traced. A telephone post-treatment 22-year follow-up interview was then performed for each of these cases to allow assessment of current drug use in relation to mortality. **Results:** The follow-up analysis estimated a percentage frequency of mortality of 13.1%, with attribution of the main cause of death revealing a connection with HIV/AIDS. Comparative analyses suggested the potential impact of some clinical conditions on drug-related mortality, namely, HIV infection, intravenous drug use, sharing of needles, unemployment and a greater number of years of heroin and other drug consumption when compared with the population of survivors. Among those who were alive, 17.4% reported that they had been using heroin and 15.5% cocaine in the previous 30 days. Our baseline and follow-up data confirm that around 10% of the heroin-addicted population presented a drinking problem. **Conclusions:** Our long-term study clearly shows the burden that HIV infection and intravenous drug use have imposed on the country in terms of mortality and morbidity. Moreover, the rate of alcohol and drug use over the follow-up period suggests that many aging heroin users are in need of continuous clinical attention.

Key Words: Heroin addiction; drug use patterns; mortality; follow-up

1. Introduction

For many years now drug addiction issues have been an unsettling focus of political agendas. The drug abuse problem turned out to be one of the main concerns of Portuguese society in the 1980s and 90s. At the time, in particular in 1997, drug addiction was considered the country's main social problem according to the Euro Barometer survey [35]. As a result, a new policy on drugs was put into practice. First of all, Portugal assumed that application of the rules of law alone was an insufficient measure against drug addiction problems, and it became the first European country to officially abolish all criminal penalties for the personal possession of drugs. To simplify, drugs were 'decriminalized', but not 'legalized'. According to the legal framework of the Portuguese drug law,

drug trafficking is considered a violent crime and a drug addict a patient who needs treatment. The new "drug action plan" privileged drug addiction in the health domain rather than legal-police intervention: jail was replaced by an offer of therapy [16].

Portugal started to gradually implement a humanitarian and pragmatic perspective to help people refrain from drug consumption and related addictions. Like other reports [9, 16, 35], a recent research study in Portugal has demonstrated that the clinical "reality" of heroin addiction has changed by being allowed to take a more positive direction. Comparing two periods of treatment admissions, classifiable as pre- and post-drug policy reform (1992-1999 and 2002-2013, respectively), the study results showed that treatment demand declined by 37%, whereas treatment engagement increased by 94% (due to bet-

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ter compliance); drug injection has decreased and heroin users are choosing to smoke heroin rather than injecting it. HIV infection decreased, too [30]. Apart from the new drug policies and other social norms, there are many other factors that might explain these changes. There have, for instance, been reductions in the prices of most substances, particularly heroin; for instance, the reported average price of 1 gram of heroin decreased from 50.27 Euros in 2001 to 33.25 Euros in 2008. Such price reductions appear to point to two phenomena: increased supply and reduced demand [16].

Currently, opiate stabilization programmes with methadone or buprenorphine are a widely used form of pharmacological treatment, showing effective results in heroin dependence trials [37]. Indeed, the introduction of methadone in the early 1990s as a treatment of choice was a major achievement in the addiction field. It enables a person who formerly engaged in often life-threatening heroin-seeking behaviour to be treated with a medication that is fully compatible with normal functioning. It keeps patients in treatment, while decreasing heroin use and related crime and health problems [20, 24]. However, despite evidence supporting the benefits of treatments – in particular, methadone maintenance treatment (MMT) – we now know from studies and clinical practice that heroin addiction is certainly a long-term disease, with what are assumed to be persistent consequences in terms of morbidity and premature mortality [13, 15]. Several studies have confirmed the high mortality of heroin addicts even after enrolment in MMT [31]. Moreover, other studies have shown that the mortality rate rises during the period following the moment when the patient leaves MMT, compared with that of opiate abusers who stay in treatment [12, 39]. Generally, accidental drug overdose and acquired immunodeficiency syndrome (AIDS) were the primary causes of death across heroin addiction cohorts [7]. Other mortality risks are trauma, heart, liver and infectious diseases. Increasing risk of death for older users by exacerbation of a pre-existing medical condition has also been suggested [5, 23]. Suicide is an outcome that makes an important contribution to the figures for overall excess mortality among heroin users, especially women [19].

Though mortality risks fall during MMT, they may increase again if the user stops treatment and resumes illegal opioid use, particularly if this resumption takes the form of heroin use by injection [17]. A study conducted by Sørensen et al, in 2005 [38], concluded that people who had achieved stable abstinence from injecting narcotics use were at lower risk of premature death than people with continued drug use.

In that sense, long-term follow-up studies play an essential role in facilitating and monitoring the potentially unstable course of heroin addiction [27, 36]. On that basis, in order to evaluate our cohort of heroin-addicted patients and understand the outcomes of treatment [30], the present follow-up analysis has aimed to explore mortality rates and related causes of death, together with current alcohol and drug use.

2. Methods

Correlational and comparative methods were used to assess the study objectives. Data were collected from the Addiction Unit of the Mental Health and Psychiatric Service of Santa Maria University Hospital in Lisbon. All patients were recruited from the therapeutic programme centre. Inclusion depended on meeting the criterion of a 'primary' diagnosis of heroin dependence. In DSM the "primary" drug is defined as the drug that causes the patient the most problems at the start of treatment. This is usually based on the request made by patients and/or on the diagnosis made by a therapist (commonly using standard instruments such as the Diagnostic and Statistical Manual of Mental Disorders - DSM) [2]. Our treatment unit has the philosophy of a "high-threshold programme", which requires the patient to accept a certain level of control and counselling. The standardized outpatient treatment protocol, generally based on a contingency management programme, combines a pharmacological and a psychosocial intervention. In pharmacological terms, the addiction unit offers an opiate stabilization programme (methadone or buprenorphine) as the treatment of choice for people who are heroin-dependent. The main psychological treatment modality is group psychotherapy (weekly; 1 hour) and constitutes the core of the rehabilitation programme. Building a new drug-free lifestyle is the main psychotherapeutic goal of the programme. Flexibility and vigilance are important features of our unit. We facilitate patient entry into treatment by avoiding waiting times, we do not specifically fix a maximum dose limit for maintenance treatment, and patients can remain in our unit as long as they want [28, 29].

In order to evaluate the outcomes of treatment, we considered the cohort sample of heroin treatment-seeking patients from 1992 to 2013 that completed the clinical protocol (N= 627 patients). For a more detailed overview of the sample of 627 heroin-de-

pendent patients, please see Pombo and Costa (2016) [30].

To examine the heroin addiction profile, patients were assessed on their use of drugs, sociodemographic and clinical characteristics, family history and drug-related lifestyle, with an abridgement of the European version of the Addiction Severity Index (Europ-ASI). This semi-structured interview had been used in earlier reports [28, 29, 30]. These data were collected at each patient's admission to the treatment unit by trained psychiatrics and psychologists (time 0).

Exclusion criteria were patients younger than 18 years of age, patients that met the criteria for "primary" cannabis or cocaine dependence (other drugs), schizophrenia and/or other psychotic disorders, state of alcoholic intoxication (or intoxication with other substances) during assessment and marked cognitive deficit or mental retardation.

2.1. Follow-up procedure

In order to implement an outcome monitoring procedure, we conducted a telephone post-treatment follow-up interview, using a feasible and validated low-budget method that had been designed to evaluate outcomes after treatment [26]. Telephone interviews were carried out by our staff nurses from June 2014 through February 2015. Main outcome measures were: survival, cause of death, alcohol and drug use in the last month and professional status. Deaths were assigned to the category of being HIV-related if the patient died from an AIDS-defining disease: opportunistic infection, Kaposi sarcoma, HIV-associated lymphoma, AIDS dementia or HIV wasting [18]. In cases of death, information about the patient was collected from collaterals. Subjects were given a guarantee that all personal information would be treated as rigorously confidential. Point prevalence was used to determine the mortality rate by measuring the number of deaths occurring in the 22-year follow-up period, divided by the number of people tracked during that period. This survival monitoring procedure was used to discriminate between two subgroups in the study ("death" versus "not-death") in order to compare their profiles and outcomes.

2.1. Follow-up sample description

The sample of patients that were traced in the follow-up comprised 222 heroin-dependent patients (35.4%), 77.9% males (N=173) and 22.1% females (N=49), with a mean age at admission of 35.1 years

and 7.6 years of education. Most of the patients in the sample were single (63.6%) and unemployed (53.2%).

2.2. Ethics

All the subjects involved in the study participated voluntarily and gave their informed consent. The study had been approved by the local Ethical Board of the Medical School of Lisbon University, and all the procedures described were conducted in accordance with the Helsinki Declaration of 1975, as revised in 1983.

2.3. Data analysis

The normal distribution of the variables was confirmed by using the Kolmogorov-Smirnov test. Thus, considering normally distributed data, parametric methods were used to calculate the numerical relationships between variables. Comparisons between the two genders regarding baseline variables (sociodemographic and drug use data) were performed using chi-squared and Student t-tests. The Mann-Whitney U test was used to test group differences regarding the educational level, since the number of years of schooling completed did not present a normal distribution. To test for differences between respondents and non-respondents in terms of sociodemographic and pre-treatment clinical data and whether these characteristics were associated with treatment outcome, we used the chi-squared (χ^2), Mann-Whitney U (Z), Student t (F) tests and linear regression models adjusted for age, gender and school level. Logistic regression was interpreted in terms of odds ratios (OR). In the comparative analysis, all categorical variables were re-investigated using a logistic regression, where age, gender and school level included in the equation. All categorical variables were dummy coded (for example, females received code 0 and males code 1). Logistic regression was interpreted in terms of odds ratios (OR). For comparisons involving clinical continuous variables, a General Linear Model (GLM) was applied, incorporating age, gender and school level, which were used as covariates. Data were analysed using the Statistical Package for Social Sciences (SPSS-Version 20.0). Statistical significance was defined at $p<0.05$.

3. Results

3.1. Characteristics of the follow-up cohort

Considering gender differences, females were younger than males (F=0.2; p=0.06), but it should be noted that the results were only marginally significant. Concerning the 'primary' drug of abuse (heroin), patients reported more than one decade of consumption, more specifically 12.7 years (sd=6.4), with users preferring to smoke heroin (68.4%) rather than injecting it (31.6%). Almost all patients had used tobacco (98.4%), alcohol (98.4%), cannabis (94.4%) and cocaine (90.3%) at some point during their lifetime. Examining now age at onset of substance use, we can see that patients started to use tobacco (13.6), alcohol (14.7) and cannabis (15.8) at a mean age of 14-15 years, and cocaine (20.8) and heroin (20.3) much later, at a mean age of 20-21 years. An experience of needle sharing was reported by 34.6%, while HIV and hepatitis C infection were reported by 23.4% and 37.8%, respectively. About 25.1% reported lifetime history problematic alcohol use. At admission, 10.7% of the cases presented current problematic alcohol use. A previous history of delinquency and criminal behaviour was present in 37.4% and 39.6% of these cases, respectively.

3.2. Follow-up results

During the 22-year follow-up period, 30 (13.5%) heroin users died (24 were males and 6 females). The main causes of mortality were HIV-related (54.2%), followed by C hepatitis (8.3%), drug overdoses (8.3%) and other remaining causes, such as accidents, suicide or cancer (29.2%). The data were analysed in order to emphasize any differences between the two groups in the study: the follow-up group who were still alive, and the group of patients who had died. Comparative analysis showed that the patients who had died presented, at admission, significantly higher scores for HIV infection, intravenous drug use and sharing of needles, and more years of heroin and other drug consumption, when compared with the population of survivors. All statistical results are presented in table 1. Among the group of survivors, 17.4% reported that they had been using heroin and 15.5% cocaine in the previous 30 days. Problematic alcohol use (in the last 30 days) was reported in 11.9% of these cases. Statistical analysis did not show any significant differences between admission and follow-up results (χ^2=0.11; p=0.74). Considering professional situation, 37.1% were employed, 54.1% unemployed and 8.8% had retired. No gender differences were observed regarding either heroin (χ^2=0.7; p=0.38) or cocaine use (χ^2=0.3; p=0.57), or professional activity (χ^2=1.4; p=0.68). In any case, problematic alcohol use was only observed in male patients (χ^2=8.1; p<0.01).

4. Discussion

This study aimed to assess in a 22-year follow-up the vital and drug use status of a cohort of heroin-addicted patients that had been admitted for treatment during the period 1992-2013.

In Europe, chronic heroin use is generally linked to premature death [10]. Overall and cause-specific mortality can be considered a valid indicator of the health effects of drug addiction [4]. According to our long follow-up study, the estimated point prevalence of mortality was 13.5%, with the main cause of death connected to HIV/AIDS. These results were further confirmed by the comparative analyses, in which infection with HIV potentially transmitted through
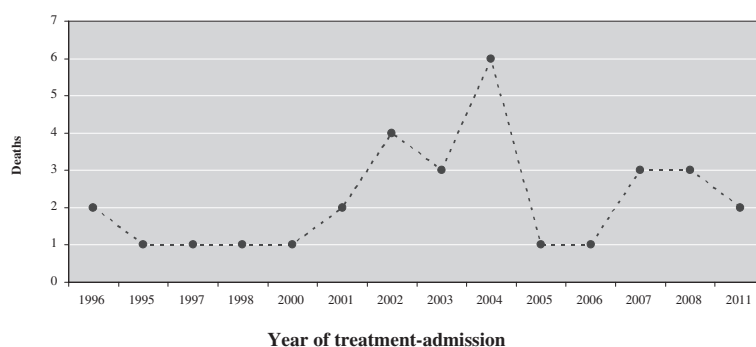

Figure 1. Deaths from all-causes according to years of treatment-admission

Table 1 - Demographic and clinical characteristics of mortality and non-mortality heroin addicted subjects

	Not-death 192(86.5%)	Death 30 (13.5%)	Statistics
Age at admission (M±SD)	35.1±7.1	34.9± 7.9	*F* =0.8 / *p*=0.85
Years of school attendance (M/SD)	7.8 / 3.3	7.4 / 2.9	Z= -1.4 *p*=0.20
Gender (%)			
Male	77.6	80.0	
Female	22.4	20.0	χ^2=0.8 / *p*=0.76
Occupational status (%)			
Employed	45.7	23.3	
Unemployed	49.5	76.7	
Retired	4.8	0.0	χ^2=8.0 / *p*=0.01
Onset of substance use			
Tobacco	13.6/3.3	13.1/3.7	*F* =0.6 / *p*=0.5
Alcohol	14.7/4.0	14.4/2.8	*F* =0.9 / *p*=0.8
Cannabis	15.8/3.3	15.7/2.9	*F* =0.1 / *p*=0.8
Cocaine	21.1/6.0	19.4/5.2	*F* =0.5 / *p*=0.2
Heroin	20.6/5.7	18.6/4.4	*F* =1.7 / *p*=0.1
Substance use habits			
Problematic alcohol use (lifetime)	24.0	33.3	OR=1.5 / *p*=0.4 (CI 95% 0.6 – 4.1)
Problematic alcohol use (current)	9.7	18.2	OR=1.4 / *p*=0.3 (CI 95% 0.5 – 4.3)
Tobacco	98.1	100.0	OR=0.0 / *p*=0.9 (CI 95% 0.0 – 0.0)
Cigarette number (day)	26.4/10.7	26.8/14.8	*F* =1.5 / *p*=0.9
Cannabis	94.7	92.3	OR=1.5 / *p*=0.6 (CI 95% 0.3 – 5.1)
Cocaine	89.3	96.3	OR=0.3 / *p*=0.26 (CI 95% 0.0 – 2.3)
Years of drug consumption	14.0/6.7	17.5/6.1	*F* =1.9 / *p*=0.04
Years of heroin consumption	12.3/6.4	15.5/6.1	*F* =1.6 / *p*=0.02
Previous drug treatments	3.0/2.4		*F* =3.5 / *p*=0.24
Drug overdoses	1.5/1.4	2.1/1.7	*F* =0.3 / *p*=0.3
Seroprevalence (%)			
HIV	20.3	43.3	OR=0.3 / *p*=0.05 (CI 95% 0.1 – 0.7)
C hepatitis	36.5	46.7	OR=0.6 / *p*=0.28 (CI 95% 0.3 – 1.4)
Mode of abuse (primary drug)			
Smoke	71.7	48.3	OR=0.4 / *p*=0.01 (CI 95% 0.1 – 0.8)
Intravenous	28.3	51.7	
Ever shared needles	29.5	65.4	OR=6.7 / *p*=0.01 (CI 95% 1.4 – 5.6)
Legal history			
Delinquency	37.5	36.7	OR=1.0 / *p*=0.8 (CI 95% 0.5 – 2.4)
Criminal behaviour	39.6	40.0	OR=0.9 / *p*=0.9 (CI 95% 0.5– 2.1)

Note: Values are expressed in percentages (%), means and *standard deviations* (M/*SD*). Groups were compared using Chi-Square (χ^2), *Mann*-Whitney U (Z), Student t (F) tests and linear regression models adjusted for age, gender and school level. Logistic regression was interpreted in terms of odds ratios (OR).

Legend: Seroprevalence for Hepatitis C Virus and Human Immunodeficiency Virus expressed the percentage of patients tested or confirmed in the medical records; Substance use habits defined the most important psychoactive substances that have been used during patients' lifetime (expressed in percentage); Problematic alcohol use categorized lifelong *alcohol related problems;* Onset of substance use was defined as the age where a patient was most likely to *have started to use a specific psychoactive substance;* Years of drug consumption and years of heroin consumption consider the length of time of all substance *use and only of heroin use, respectively;* Previous drug treatments, was defined to assess whether the patients had previously been in some kind of "formal" treatment for drug abuse; Mode of abuse (primary drug) considers the behaviour associated with heroin consumption; and the Legal history refers to the percentage of patients that reported a delinquent behavior or/and criminal activity over the *lifetime.*

shared needles and syringes in the context of intravenous drug use were common markers of death. Our results are in accordance with findings from other cohorts of drug-using patients. For instance, a population-based, nationwide prospective cohort study of HIV-infected patients showed that HIV-positive patients infected due to a habit of injecting drugs had a substantially increased overall mortality compared with patients who had acquired their infection through other routes [18]. Among this population of injecting drug users, death could result from serious infections connected with AIDS, such as pneumonia, endocarditis or sepsis.

At treatment admission patients who had later died presented a longer drug-use career than that of the surviving patients. With respect to deaths related to drug use in Portugal, data from the Portuguese National Institute of Statistics point to approximately 10-30 deaths annually, marked by slight fluctuations over the years [35]. The pattern of deaths had apparently changed from being largely due to overdose in the early 1980s to predominantly AIDS-related in later years [32]. Our results corroborate several other reports across Europe that have consistently shown that the practice of injecting drugs is associated with a high risk of death, particularly from the complications of HIV infection and full-blown AIDS [13, 23, 34, 41]. A ten-year survival analysis of a cohort of 138 heroin addicts in Catalonia concluded that 41 of those addicts had died (30%) [34]. A previous study on drug-related mortality across eight European countries reported mortality rates ranging from 1 per 100 person-years in Dublin and London to 3.8 per 100 in Barcelona – rates that were 6-54 times higher than those expected in the general population. The lowest mortality rate was recorded in Lisbon; however, the authors concluded that this result may reflect problems arising from the coding/certification of deaths [5]. A follow-up study among users of drugs (heroin, cocaine, and/or amphetamines) in Amsterdam (n = 899; 1985–2002) noted that at least 27% of drug users had died within 20 years after starting regular drug use and that the prevalence of abstinence for at least 4 months from the above drugs and methadone was only 27% at 20 years since initiation [40]. At this point it should be pointed out that the task of comparing these types of studies is difficult because of the use of different study groups, methods, and calculations, as well differences between sample sizes, countries of origin, and the length of follow-up periods [4, 13].

Heroin addiction is a chronic relapsing condition [15], in which episodes of frequent use of the drug often alternate with episodes of abstinence [14, 32, 40]. Considering the main drug of abuse (heroin) in our follow-up assessment, 17.4% of participants were probably in a relapsing condition. The rate of current heroin use in the sample of survivors participating in our study is comparable with that of other long-term follow-up studies. For instance, two 33-year follow-up studies observed rates of 20.7% [15] and 20% [25] and recently, Jimenez-Treviño et al, in 2011 [13], in a 25-year follow-up study found a 22.6% rate of current heroin use in patients admitted to methadone treatment for the first time. In general, our findings support the conclusions of Termorshuizen et al, [40], who posit that the mortality rates and the prevalence of abstinence among patients who remained alive over the long term indicate that the concept of natural recovery or "maturing out" in reaching a drug-free state does not apply to a substantial portion of the addict population.

Although heroin users commonly present an unstable employment situation, psychosocial factors such as unemployment have received little attention among illicit drug users [42]. In our study, the experience of unemployment was frequent (53.2% at hospital admission), undesirably stable (54.1% at the 22-year follow-up) and found to be a significant indicator of a mortality effect (76.7% in the sample who died). According to previous reports [7, 19], unemployment may be a marker of poor social integration or of difficulties in obtaining access to and benefiting from available health services. Therefore, given that heroin users face a variety of obstacles in finding employment, possibly due to stigma, their drug-related lifestyle, inadequate education and skills, or health problems, our findings emphasize the need to centre the therapeutic focus on the psychosocial difficulties encountered in making the transition to employment.

Alcohol misuse in heroin addiction is a serious clinical problem [28, 29] – a phenotype typically seen as a conversion of what was, initially, essentially a form of opioid dependence into polytoxicomania and alcoholism [6]. Maremmani, et al. [22] argued that alcohol-abusing heroin addicts seem to suffer from a metabolically acquired stain, which derives from preconditioning opiate abuse, and later prompts either opiate- or alcohol-seeking behaviour in an addictive way. The authors call it a masked form of "heroinism". Even though some variations in the prevalence of alcohol abuse may occur, since different definitions of problematic alcohol use are employed and the populations studied are heterogeneous, our baseline and

follow-up data confirm that around 10% of the heroin addicted population presented a drinking problem in the previous 30 days. Alcohol-related problems were more prevalent among men than women [3]. The stable course of alcohol abuse in drug use populations has been documented in the previous literature [15, 21]. For instance, a study conducted by Fairbank et al. [11], who compared the consumption of six substances (cocaine, amphetamines, illegal methadone, marijuana, tranquilizers and chronic alcohol use) in a 1-year follow-up, observed the generally lower levels of substance use in the follow-up assessment, except for alcohol use, which remained stable during the preadmission and follow-up years. It has also been shown that methadone-using patients who drink excessively are at a significantly greater risk of getting cirrhosis, esophageal varices, or other medical complications, and run a high risk of death [1]. Higher death rates and medical illness have been reported among alcohol-using patients in methadone treatment [33]. Even though higher percentages of current and lifetime problematic alcohol use (18.2 vs. 9.7% and 33.3 vs. 24.0%, respectively) were observed in the population of those who died, when compared with the cohort who lived, results were not statistically significant. In conclusion, our study results on alcohol use clearly prompt the recommendation that drug treatment units should implement a clear policy for treating alcohol-related problems. Because patients who drink heavily are those who are most vulnerable, and also those whose predicament is most likely to remain undetected even in treatment settings, clinicians should carefully screen all patients for alcohol abuse and offer appropriate combined pharmacological and psychosocial treatment [8].

Limitations

The results reported here should be considered in the light of certain limitations. The first is the quantity of data that are missing from the follow-up analysis. Patient-tracking problems emerged as the major reason for non-response, but this particular issue is inevitable in the present type of research, mainly because of the long follow-up time and the unstable lifestyle of these patients, for instance, in terms of keeping track of telephone numbers or home addresses [26]. Secondly, there is the lack of information regarding psychiatric comorbidity. Thirdly, we exclusively recruited heroin-addicted subjects from a treatment setting that probably differs from that of patients who do not enter treatment. We should therefore be extremely cautious about extending our results to other populations. Furthermore, although it is considered by definition that patients 'voluntarily' seek help in our drug dependence unit, we have to ponder in the light of our national drug policy that some patients may be assigned to seeking treatment by recommendation of the Commissions for the Dissuasion of Drug Abuse (cases of illegal drug use), a committee consisting of three people nominated by the Ministries of Health and Justice. Fourthly, given the importance of immune system disorders among the causes of death within the cohort, it is quite possible that HIV infection was such a powerful predictor of death that it swamped the rest of the predictive factors [34]. Fifthly, causes of death were not confirmed by the national mortality database, but they were clearly confirmed by the hospital records. Lastly, although there are key causes of death directly attributable to problematic drug use, heroin-addicted patients can die from many other 'ordinary' causes.

5. Conclusions

In general, our results agree with other positive findings achieved in our previous study [30]. Our 22-year follow-up study in treatment-seeking patients who had a history of heroin addiction showed a relatively low rate of premature death (13.5%). Among those who died, we must highlight the impact that HIV infection (AIDS) has had on the mortality rate of the population of heroin addicts since the early nineties, mainly due to drug use by injection. Although most of these patients reported a stable, drug-free status two decades later, we must note the undesirably stable prevalence of alcohol-related problems (around 10%).

In sum, our results clearly confirm the assumption that, by limiting the negative impact of intravenous drug use (and of what is, plausibly, the consequent transmission of HIV), we will be able to significantly improve the overall levels of health of the population. The prevalence of drug and alcohol use in the sample suggests the need for constant monitoring of our elderly patients.

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