Isr J Psychiatry Relat Sci Vol 43 No. 2 (2006) 126–136

Does Psychiatric Comorbidity Affect Drug Abuse Treatment Outcome? A Prospective Assessment of Drug Abuse, Treatment Tenure and Infectious Diseases in an Israeli Methadone Maintenance Clinic

Marc Gelkopf, PhD,[1,2] Tal Weizman, MD,[3] Yuval Melamed, MD,[1,4] Miriam Adelson, MD,[5] and Avraham Bleich, MD, MPH[1,4]

1 *Lev Hasharon Medical Mental Health Center, Pardessia, Netanya, Israel*

2 *Jerusalem Methadone Center, Jerusalem, Israel*

3 *Department of Psychiatry, Sourasky Medical Center, Tel Aviv, Israel*

4 *Sackler Faculty of Medicine, Tel Aviv University, Ramat Aviv, Israel*

5 *The Sheldon G. Adelson Clinic for Drug Abuse Treatment and Research, Tel Aviv, Israel*

Abstract: Objective: The influence of psychiatric comorbidity in drug addicts on therapeutic outcome is an important unresolved issue. We studied the links between patterns of psychiatric comorbidity and psychological distress with treatment outcome variables. *Method:* 151 methadone maintenance patients underwent a structured clinical interview, twice-weekly urinalysis for traces of drugs of abuse, and completed psychological distress and risk-taking questionnaires for periods of up to three years. Treatment tenure, demographics and hepatitis C status were recorded. *Results:* High levels of lifetime (82.8%) and current (66.2%) Axis I psychiatric comorbidity were mostly anxiety and affective disorders many of which were substance induced. Patients with current psychiatric comorbidity had significantly more current substance use disorders, although they did not abuse more drugs or remain in treatment less time than patients with no current psychiatric comorbidity. Patients with a lifetime Axis 1 disorder remained in treatment longer. Severity of psychological distress was related to current substance-related diagnoses, benzodiazepine abuse, higher methadone dosage, risk-taking behavior and the presence of hepatitis C. *Conclusions:* Severity of psychological distress, but not comorbid psychiatric disorders, has a major negative association with treatment outcome of patients receiving methadone maintenance treatment (MMT). Surprisingly patients with comorbid mental illness seem to remain in treatment longer than those without. Therapeutic efforts should also focus on treating subjective distress and its possible influence upon drug use behavior.

Introduction

Substance abuse and dependence have far-reaching social, medical, psychological and economic consequences. Treatment is complex, time- and cost-consuming and necessitates cross-professional therapeutic efforts. Concomitant psychiatric disorders and profound feelings of psychological distress identified in many substance abusers pose an even greater therapeutic challenge (1).

The link between patterns of comorbidity and medical (2, 3), psychological (4), and behavioral (3) status (such as risk-taking behaviors); and treatment variables such as continued drug abuse (5, 6), methadone dosage (7) and treatment tenure (8) has yet to be clarified.

We addressed the following questions: What is the:

1) prevalence of Axis 1 psychiatric substance- and nonsubstance-related disorders in Israeli methadone maintenance treatment (MMT) patients?
2) association between age, gender, ethnicity, marital status, education and history of incarceration on the presence of psychiatric comorbidity?
3) association between age at drug or heroin abuse onset, and history of treatment on psychiatric comorbidity?

Address for Correspondence: Marc Gelkopf, PhD, Research Director, Lev Hasharon Mental Health Medical Center — Pardessia, POB 90000, Netanya 42100, Israel. E-mail: emgelkopf@013.net.il

4) association between psychiatric comorbidity and the diagnosis of substance use disorders on treatment outcome measures?
5) influence of psychological distress on treatment tenure, continued drug abuse, methadone dosage, hepatitis C and HIV/HCV risk-taking behavior?

We studied the prevalence of Axis 1 psychiatric comorbidity and psychological distress in MMT patients. Data regarding drug abuse history, drug abuse during treatment, treatment tenure, psychological distress, hepatitis C status and HIV/HCV risk-taking behavior were recorded.

Methods

Sample and treatment program

The sample comprised 151 opioid-dependent men and women consecutively admitted during a three-year period to our outpatient MMT clinic in a university-affiliated hospital in Tel Aviv, Israel. Methadone maintenance pharmacotherapy is administered in conjunction with appropriate medical treatment (9, 10). All patients attend weekly counseling sessions. One psychiatrist sees patients on an appointment-based schedule or by staff request. Clinic policy and patient admission follow the CSAT guidelines for MMT (11). Patients are discharged from treatment if they act violently within the clinic compound but not for low treatment adherence or drug abuse.

The 151 admissions constitute 85.8% (151/176) of *all* patients formally admitted to the clinic. Of the 25 patients excluded from the study, 18 left treatment before completing the initial assessment, five were unavailable due to hospitalization and two were illiterate. Hepatitis C status, HIV status, and TB status were confirmed by the medical records of 139, 145 and 151 patients, respectively. Data on drug abuse during treatment follow-up were retrieved following one, two, and three years (for 120, 105 and 94 patients, respectively). Box 1 presents the number of subjects for each measured variable and Table 1 presents the sample's demographic and medical data.

All recruits voluntarily provided written informed consent for participation following a thorough explanation of study procedures. Participants were not remunerated or otherwise rewarded. The study was approved by the Institutional Review Board.

Box 1. *Interviews, questionnaires and medical tests performed*

Questionnaire, interview or test used	N
SCID 1	151
SCL-90-R	151
HIV/HCV risk behavior	151
ASI	151
Drug abuse after 1 year of treatment	120
Drug abuse after 2 years of treatment	105
Drug abuse after 3 years of treatment	94
Hepatitis C	139
HIV	145
TB	151

Overall design

The study was a prospective evaluation of psychopathology, medical status and drug abuse treatment outcome. Data was collected using appropriate questionnaires.

Assessment data were collected one to two months after study admission and after stabilization on a methadone dose (range, 20–180 mg.). Patients were screened for evidence of drug intoxication or withdrawal before interviewing and administration of questionnaires.

To ensure a comprehensive representative sample, and to avoid evaluating "only" those who remained in treatment, we analyzed the complete set of data despite the significant number of dropouts prior to the three-year endpoint. The one- and two-year retention rates in our sample were 79.5% and 69.5%, respectively. Our conclusions are relevant exclusively to the MM treatment setting and for first intake into the clinic since no outreach was performed and returning patients were not re-entered into the study. The differences between patients who dropped out and those who remained in treatment were evaluated separately in different regression analyses. Attrition was considered a major outcome variable.

Assessment measures

Diagnoses were made using the Structured Clinical Interview for DSM-IV (SCID 1; 12, 13).

Severity of psychological distress was assessed using the Symptom Checklist 90-Revised (SCL-90-R). The SCL 90-R is a 90-item questionnaire assessing psychological distress distributed along nine factors: depression, anxiety, phobic anxiety, interpersonal sensitivity, psychosis, paranoid ideation, hostility, somatization and obsessive-compulsive behavior. The patients were asked to assess their symptoms on a 5-point Likert scale, ranging from 0 "not at all" to 4 "extremely." The alpha coefficient ranges from .77 to .90, and test-retest values are reported to range from .78 to .90 (14).

Drug abuse during treatment was assessed by urinalysis. Patients underwent two *randomized* (computer-generated dates) *observed* (to assure that "genuine" samples were rendered) urine tests per week for the duration of treatment. These samples were analyzed for morphine/codeine, benzodiazepine (BZD), cannabis, amphetamines and cocaine using the "EMIT" method (15) in an external laboratory.

Retention rate. Attrition was calculated in number of days the patient remained in treatment. Files were closed for patients unjustifiably absent from treatment for more than 14 days.

History of drug abuse and demographic data were taken from the Addiction Severity Index (ASI; 16) admission interview, usually performed during the first two to three weeks of treatment. Severity scores were not considered. The ASI has acceptable psychometric norms (17).

HIV/HCV risk behavior was assessed after about two months of treatment. Patients were queried using our standard clinic questionnaire, developed for a previous study (18): 1. Did you inject drugs during the past six months? 2. Have you shared needles during the past six months? 3. Did you have sex in order to obtain drugs or money for buying drugs during the past six months? 4. Does your sexual partner (or one of your sexual partners) use drugs? 5. Do you always have safe sex? 6. Do you have a steady sexual partner? The combined score was recorded.

Patients underwent testing for *infectious illness* status (hepatitis B, hepatitis C, HIV/AIDS and Tuberculosis) within the first two months of treatment.

Table 1. *Demographic, drug abuse history and medical data at treatment intake*

	Mean (Sd; range) or N (%)
Age	37.0 (Sd=7.6; range21–62)
Female gender	N=34 (22.5%)
Ashkenazic descent	N=46 (30.5%)
Sephardic descent	N=89 (58.9%)
Mixed descent	N=12 (7.9%)
Arabic	4 (2.6%)
Married or living with partner	N=74 (49%)
Years of education	9.7 (Sd=2.9; range 2–18)
Unemployed	N=118 (78.1%)
Age at onset of use of any substance	19.2 (Sd=6.2; range 9–54)
Age at onset of use of opiates	24.2 (Sd=7.8; range 13–53)
Declared use of more than one substance at intake	N=99 (65.6%)
Served prison time	N=78 (51.7%)
Hepatitis C	N=82/139 (59%)
HIV	N=3/145 (2.1%)
TB	N=0/151 (0%)

Interviewer training

Three psychiatrists trained to administer the structured clinical interview (19) performed the patient interviews. Whenever questions or uncertainties arose, patients were re-interviewed by another psychiatrist and the case was discussed until an agreement was reached. A trained PhD psychologist administered the SCL-90-R. The patients' personal therapists, who had all undergone appropriate training, administered the ASI. The HIV/HCV questionnaire was administered by a clinical psychologist expert in AIDS/HIV. As we were aware of the difficulty in distinguishing drug induced diagnosis from regular diagnosis, special care was taken to make this distinction by having interviewers investigate in depth the possible casual relationship between drug use and the appearance of diagnosis-related symptoms.

Statistical Analysis

The clinical and demographic characteristics of patients with and participants with no psychiatric comorbidity were evaluated by sorting patients into mutually exclusive groups based on their psychiatric diagnostic profiles. The stepwise entry or conditional mode was used for regression, logistic regressions (simple and multilevel) and Cox regression survival analyses. *T*-tests for continuous variables and chi-square tests for categorical variables were also performed as needed. The results of the urinalyses are presented in percentage of positive tests for any of the substances tested for the month under scrutiny. The SPSS 11.5 package for PC was used for all analyses.

Table 2. *Prevalence of Axis 1 nonsubstance use disorders*

Diagnostic Category	Current rate %		Lifetime rate (%)	
	N	%	N	%
Any Axis 1 disorder	100/151	66.2	125/151	82.8
Any mood disorder	57/151	37.8	106/151	70.2
Bipolar	1/57	1.8	2/106	1.9
Major depressive	10/57	17.5	21/106	19.8
Dysthymic	9/57	15.8	8/106	7.5
Substance induced	36/57	63.2	75/106	70.8
Any anxiety disorder	51/151	33.8	76/151	50.3
Panic disorder	3/51	5.9	3/76	3.9
Social phobia	1/51	2.0	2/76	2.6
Specific phobia	2/51	3.9	2/76	2.6
Obsessive-compulsive	2/51	3.9	2/76	2.6
General anxiety	1/51	2.0	1/76	1.3
Posttraumatic stress	11/51	21.6	11/76	14.5
Due to General medical condition	3/51	5.9	5/76	6.6
Not specified	5/51	9.8	4/76	5.3
Substance induced	23/51	45.1	46/76	60.5
Any psychotic disorder	13/151	8.6	40/151	26.5
Schizophrenia	7/13	53.9	7/40	17.5
Delusional disorder	2/13	15.4	2/40	5.0
Substance induced	4/13	30.8	31/40	77.5
Adjustment disorders	26/151	17.2		
Somatoform pain disorder	1/151	0.7		

Results

Nonsubstance use diagnosis

Lifetime disorders

More than 4/5 of the members of the study cohort had a lifetime psychiatric diagnosis other than a substance use disorder (mood disorders 70.2% anxiety disorders 50.3% and psychotic disorders 26.5%). Substance(s) had induced 70.8% of the mood disorders, 60.5% of the anxiety disorders and 77.5% of the psychotic disorders.

Current disorders

Two-thirds of the sample had a current psychiatric diagnosis other than a substance use disorder: (mood disorders 37.8%, anxiety disorders 33.8%, psychotic disorders 8.6% and adjustment disorders 17.2%).

Substance(s) had induced 63.2% of all the mood disorders, 45.1% of the anxiety disorders, and 30.8% of the psychotic disorders. Prevalence rates are presented in Table 2.

Substance use diagnoses

In addition to heroin dependence, patients had an average of .49 (SD=.84) current dependencies, 1.83 (SD=1.42) lifetime dependencies, .70 (SD=.76) current abuse and 1.07 (SD=.91) lifetime abuse. The patients had a total of 1.19 (SD=1.27) current abuse or dependence diagnoses and 2.90 (SD=1.59) lifetime abuse or dependence diagnoses. In addition to heroin dependence, 69% (n=92) had at least one or more current abuse or dependence diagnoses and 92.1% (n=139) had at least 1 or more lifetime abuse or dependence diagnoses. Prevalence rates are presented in Table 3.

The relationship between current psychiatric comorbidity and demographic and history of use were analyzed by comparing patients who had a current nonsubstance psychiatric comorbidity (n=100) with those who did not (n=51).

No significant demographic differences were found between the groups with and without comorbidity in terms of age (37.5 vs. 38.5 years, t=-.77, df=149, P=.44), gender (75% male vs. 82.4%, X^2=1.05, df=1, P=.30), ethnicity (33% vs. 25.5% Ashkenazi origin, 53% vs. 70%, Sephardi origin, 11% vs. 2% mixed origin, 3% vs. 2% Arab origin; χ^2=6.0, df=3, P=.11), years of education (9.7 vs. 9.6, t=.15, df=149, P=.88), percentage of divorced or separated patients (49% vs. 54.9%, χ^2=.47, df=1, P=.50), percentage of employed patients (23% vs. 19.6%, χ^2=.22, df=1, P=.63) and whether the patient had ever been incarcerated (47% vs. 60.8%, χ^2=2.6, df=1, P=.10).

Table 3. *Prevalence of Axis 1 substance use diagnoses*

Substance of dependence and abuse	Current (*n*)	Current (%)	Lifetime (*n*)	Lifetime (%)
Methadone dependence	151	100	151	100
Sedative dependence	77	51.0	96	63.6
Sedative abuse	3	2.0	17	11.3
Cocaine dependence	11	7.3	18	11.9
Cocaine abuse	17	11.3	65	43.0
Amphetamines dependence	7	4.6	15	9.9
Amphetamines abuse	12	7.9	48	31.8
Cannabis dependence	8	5.3	16	10.6
Cannabis abuse	34	22.5	95	62.9
Alcohol dependence	3	2.0	16	10.6
Alcohol abuse	4	2.6	12	7.9
Hallucinogens dependence	0	0	0	0
Hallucinogens abuse	4	2.6	41	27.2
Polydrug dependence	8	5.3	16	10.6
Polydrug abuse	10	6.6	49	32.5

A lifetime Axis 1 diagnosis was significantly correlated with age at onset of abuse of any drug (17.69 vs. 21.79 years, t=-3.22, df=149, P=.002), but not with the age at onset of opiate abuse (24.87 vs. 23.92 years, t=.57, df=149, P=.57). The number of months in previous methadone treatment was marginally related to the presence of lifetime comorbidity (6.1 vs. 1.3, t=1.87, df=149, P=.06).

There was significantly more current substance use among patients with than among those without current psychiatric comorbidity (1.39 vs. 0.80, t=2.90, df=149, P=.004). This was due to the drug "abuse" diagnoses (.62 vs. .23, t=3.06, df=149, P=.003) and was not associated with the drug "dependence" diagnoses (.77 vs. .57, t=1.56, P=.12). Regression analysis showed current psychotic disorders (T=1.95, P=.05) and current mood disorders (T=2.5, P=.01) to be significantly related to the number of current substance use diagnoses. Current drug-induced disorders were found to be significantly related to current substance use diagnoses (1.83 vs. .99 substance use diagnoses, P=.000).

Treatment adherence

The Cox regression survival analysis suggested that patients with a lifetime Axis 1 disorder remain in treatment about twice as long as those without (B=-.65, S.E.=.32, Wald=4.3, P <.04, Exp. (B)=0.52). Neither a current diagnosis of psychiatric comorbidity nor a specific category of current or lifetime diagnoses was found to be related to treatment tenure.

Although the global SCL-90-R score was not found to be related to treatment tenure, the SCL-90-R depression factor was found to significantly predict worse retention (B=.79, S.E.=.37, Wald=4.5, P<.03, Exp.(B)=2.2).

Drug abuse and methadone dosage

Regression analyses for all drugs of abuse at treatment entry and at one, two and three years into treatment failed to find any relationship between the presence of a current or lifetime psychiatric illness and illegal drug abuse or methadone dosage. The results after one year of treatment are presented in Table 4.

Table 4. *Percentage of urinalyses positive for heroin, benzodiazepines, amphetamines, cannabis and cocaine after one year of treatment for patients with and those without a lifetime and current psychiatric disorder*

	% of positive urine tests for patients with a current disorder		% of positive urine tests for patients without a current disorder	
Heroin	21.3	(SD=32.0)	15.1	(SD=30.0)
Benzodiazepines	31.7	(SD=40.8)	24.7	(SD=38.0)
Amphetamines	4.4	(SD=17.4)	8.7	(SD=21.6)
Cannabis	11.6	(SD=25.5)	9.6	(SD=26.8)
Cocaine	3.9	(SD=13.5)	2.2	(SD=11.2)
	% of positive urine tests for patients with a lifetime disorder		% of positive urine tests for patients without a lifetime disorder	
Heroin	19.8	(SD=30.9)	16.6	(SD=35.3)
Benzodiazepines	31.1	(SD=40.8)	18.3	(SD=32.2)
Amphetamines	5.4	(SD=17.8)	8.3	(SD=25.7)
Cannabis	11.5	(SD=25.9)	7.4	(SD=25.8)
Cocaine	3.7	(SD=13.8)	0.8	(SD=3.2)

Drug abuse during treatment

Although regression analysis did not show any significant relationship between drug abuse during treatment and the presence or absence of a lifetime or current disorder, regression analyses with the major diagnoses as dependent variables and percentage of positive urinalysis for heroin, benzodiazepines and cocaine at one year into treatment as independent variables revealed a correlation between lifetime psychotic disorder and benzodiazepine abuse at one, two and three years, respectively, into treatment (regression analysis, T=1.96, P=.05; T=2.5, P=.01, T=3.5, P=.001). No such relation was found for current psychotic disorders.

Psychological distress was found to be significantly related to continued benzodiazepine use at one, two and three years into treatment, respectively (regression analysis with all measured drugs of abuse as independent variables; T=3.8, P=.000; T=2.0, P=.05; T=3.7, P=.000), and not to any other drug of abuse. Regression analysis also showed a significant relationship between psychological distress and methadone dosage (T=4.13, P=.001).

Psychological distress

Psychological distress was found to be related both to the presence of a current non-substance diagnosis (T=2.1, P=.0.36) as well as to more substance-related diagnoses (T=5.4; P=.02).

HIV/HCV risk-taking behavior and hepatitis C

No cases of TB and only three cases of HIV were found; therefore no statistical analyses could be performed on these items.

No relation was found between the presence of any Axis 1 current or lifetime psychiatric diagnosis and the presence or absence of hepatitis C or risk-taking behavior. Patients with hepatitis C had higher psychological distress scores than those without (with hepatitis C=1.34, without hepatitis C=0.95; T=-2.6, P=022). Hepatitis C was also significantly related to HIV/HCV risk-taking behavior. A multinomial regression model showed a significant relationship between psychological distress, HIV/HCV risk-taking behavior and hepatitis C (F=3.7, P=.027). No such relationship was found with the presence of an Axis 1 diagnosis.

Discussion

Psychiatric comorbidity

Prevalence rates of comorbid Axis 1 psychiatric disorders in MMT patients vary widely among different studies. Our current (66.2%) and lifetime (82.8%) prevalence rates are in agreement with studies reporting these high rates (8, 19, 20). As in most other studies, current affective (37.8%) and anxiety (33.8%) disorders were diagnosed most frequently (2, 6). The present study is unique in that it differentiated between drug-induced and non-drug induced disorders. We found 63.2% of the current affective diagnoses and 45.1% of the current anxiety disorders to have been drug-induced, suggesting that many psychiatric symptoms observed in drug addicts are, in fact, drug induced and probably time limited.

We found relatively more current psychotic disorders than reported by Brooner et al. (2) (8.5% and 0.1%, respectively). This may be related to the availability of psychiatric treatment at the clinic and to referrals of severe psychiatric patients. Although 26.5% of the participants in our study sample were diagnosed with a lifetime psychotic disorder, it emerged that 20.5% of them were substance induced. Our clinical experience suggests that only a limited number of patients have psychotic breakdowns during MMT, and that these breakdowns seem to be due to the continued abuse of drugs, most often cocaine or amphetamines or a mixture of "uppers" and "downers."

Unexpectedly, we found "only" 11 patients (7.3%) with posttraumatic stress disorder (PTSD). Since many of our patients survived intensive negative, life-threatening experiences and may often experience stressful situations, this finding hints that it might reflect a process of ongoing desensitization whereby traumas and related symptoms become "routine" events resulting in fewer diagnoses of PTSD. In the same vein, since Israeli combat-related PTSD patients are diagnosed relatively early and are often treated in cooperation with the military mental health facilities, they would be less likely to be enrolled in our clinic.

We also revealed an adjustment disorder in about 17% of our sample. This relatively high prevalence reflects the intensive stressogenic nature of these patients' lives. The rarity of this entity in previous

studies may be related to the use of earlier versions of DSM that do not include the diagnosis of adjustment disorder.

Substance-related diagnosis and substance abuse

Most patients had one current substance-related diagnosis aside from heroin dependence. Sedative abuse/dependence was the most prevalent current (53%) and lifetime (74.9%) diagnosis. One of our previous studies showed BZD to be the secondary drug of abuse in our clinic, similar to other MMT clinics in Israel (21, 22). The relatively low level of current alcohol abuse/dependence (4.6%) and the near absence of current hallucinogenic dependence (2.6%) is also interesting. This pattern seems to have changed since 1992 when mass immigration from Russia introduced a different culture of drinking alcoholic beverages and of drug abuse into the country.

The stringent diagnostic definition of the DSM-IV for polydrug abuse/dependency led to the relatively low prevalence in this category. Our results show that many patients abuse many different drugs but not indiscriminately, and heroin is usually the dominant drug of abuse/dependence.

The presence of a current psychiatric disorder was found to be related to a greater prevalence of substance dependency. This may appear to contradict our earlier results that reported no relation between psychiatric comorbidity and actual (urinalysis) abuse of drugs during treatment. The obvious difference between "objective" and "subjective" reports of substance use — as exemplified in the difference between urinalyses-based and interview-based results suggests that both measures report different aspects of drug abuse and that although patients with a psychiatric diagnosis do not necessarily abuse more drugs than those without, they perceive themselves as being more dependent and abusing. This is reflected by the involvement of almost all classes of drugs and of all psychiatric diagnoses.

Age of first abuse

The age at first abuse of any drug was found to be significantly related to the presence of a lifetime psychiatric diagnosis, suggesting that patients with psychopathology would experiment relatively earlier and with more different drugs, possibly in order to self-medicate an existing psychological distress. The alternative option that an early start with heroin abuse tends to lead to psychopathology was not supported by our data, since we found no relation between diagnosis and time of onset of heroin abuse.

One reason why youngsters with psychopathology do not abuse more heroin notwithstanding their tendency to self-medicate may be due to its relative unavailability, and because cannabis and/or sedatives are more readily available.

Treatment tenure

Contrary to studies that suggested that patients in MMT with psychiatric comorbidity had less favorable treatment outcomes than patients without (20, 23, 24) we found that patients with current psychiatric comorbidity did not reveal worse outcomes. Moreover, patients with a lifetime psychiatric comorbidity tended to remain in treatment longer than those without. A possible explanation for this discrepancy may be that our study patients were treated with adequate dosages of methadone (mean 102.3 mg.) and received ongoing psychiatric and psychotherapeutic care. It is plausible that individuals with a history of psychopathology may have profited more than others from the therapeutic setting as we treated both addiction and psychiatric problems interactively. A post-hoc analysis of the average number of monthly psychotherapy meetings during the first year of treatment suggests that patients with a lifetime diagnosis received more monthly treatment sessions than those without (patients w. diagnosis=3.78, SD=1.07; patients without diagnosis=2.89, SD=1.26; T=3.74, p=.000). This supports the idea that patients with an Axis 1 diagnosis requested and received more help and support than those without. These results are in accordance with those of Maremmani et al. (25).

Drug abuse and methadone dosage

We did not find the presence of any current Axis 1 diagnosis to be related to continued drug abuse (heroin, BZD, cannabis, cocaine, amphetamines). The only exception was a lifetime psychotic disorder that was related to continued BZD abuse. However, severity of psychological distress, as measured by the SCL-90-R, was found to be related to continued ille-

gal BZD abuse. These results are in line with McLellan et al.'s (26) and Rounsaville et al.'s (23) findings that psychiatric severity based on number, intensity and duration of symptoms was related to poor outcomes to a greater extent than the psychiatric diagnosis itself.

Our data supports the self-medication approach by asserting that psychological distress may be a far better predictor of severity of addiction than psychopathology, although distress may clearly be related to psychopathology.

Contrary to findings from other studies (7, 25), we did not find that methadone dosage was related to the presence of psychiatric comorbidity. We did however find a significant relation between methadone dosage and psychological distress (using the SCL-90-R). This raises the question of whether methadone has any psychotropic effect (27, 28) and whether patients attempt to self-medicate to relieve their psychological distress with methadone or a mixture of drugs and methadone.

A major difference between a psychiatric diagnosis as determined by the SCID and psychological distress as determined by the SCL is the different time frames upon which these measures focus. The SCL-90-R relates to experiences from the previous two weeks, while the SCID relates to longer time frames — depending upon the diagnosis. Thus, the SCL-90-R might be more focused in its measurement of current distress. Furthermore, since it is a scaled instrument it more may be sensitive than yes/no criteria.

Risk taking and hepatitis

Our results suggest that psychological distress but not a psychiatric diagnosis is related to the presence of hepatitis C. Patients with higher levels of psychological distress tend to take more risks and, as a consequence, contract hepatitis C more frequently. Thus, although an existing psychiatric diagnosis is related to psychological distress, it is not the presence of that disorder which may affect risk-taking behavior but rather the presence of psychological distress. This might also explain the results in previous studies linking BZD abuse to the presence of hepatitis C (18). BZD abuse may be the product of psychological distress, and not necessarily be directly implicated in risk-taking behavior.

Conclusions

The high prevalence of concomitant psychiatric disorders of our study cohort suggests that opiate addicts in MMT often need to receive psychiatric and psychological treatment along with pharmacotherapy. Given that the psychiatric disorders in almost one-half of the patients with an Axis 1 diagnosis seem to be drug induced, treatment for these patients should be different than for those with a non-drug induced diagnoses. Clear guidelines are mandatory for differentiated patient management.

Although MMT aims its treatment at opiate addiction, most patients abuse at least one or more other drugs. Treatment planning should consider this and suggest different medical or/and psychological therapeutic means for dealing with the different drugs of abuse (21). MMT centers need various treatment options for these individuals. In addition patients with psychiatric comorbidity do not necessarily abuse more drugs than other patients, but they rather tend to perceive themselves as more vulnerable to drug abuse and dependency, having less tolerance, losing control faster and that drug abuse impacts upon their lives more than it does others. As such, even when these patients are observed to be low-level abusers, these frailties should be taken into account.

Finally, our findings provide evidence indicating that psychological distress can be considered as a risk factor in the contraction of infectious diseases.

Limitations

1. Our conclusions are relevant exclusively to the MM treatment setting since no outreach was performed and returning patients were not re-entered into the study.
2. To ensure a comprehensive representative sample, and to avoid evaluating "only" those who remained in treatment, we analyzed the complete set of data despite the significant number of droputs prior to the 3-year endpoint (the 1- and 2-year retention rates in our sample were 79.5% and 69.5%, respectively).

Clinical Implications

1. The high prevalence of concomitant psychiatric disorders of our study cohort suggests that opiate addicts in MMT often need to receive psychiatric and psychological treatment along with pharmacotherapy.
2. Given that the psychiatric disorders in almost one-half of the patients with an Axis 1 diagnosis seem to be drug induced, treatment for these patients should be different than for those with a non-drug induced diagnoses.
3. Although MMT aims its treatment at opiate addiction, most patients abuse at least one or more other drugs. Treatment planning should consider this and suggest different medical and/or psychological therapeutic means for dealing with the different drugs of abuse.

Acknowledgements

We thank Dr. Rachel Hamburger as the head scientist of the Israel Anti-Drug Authority for supervising the grant received for this study. We thank Rena Kurs for editorial assistance and Drs. Helen Rappaport and Rachel Hayward for their assistance in administrating the interviews and questionnaires.

References

1. Johnson S. Dual diagnosis of severe mental illness and substance misuse: A case for specialist services? Br J Psychiatry 1997;171:205–208.
2. Brooner RK, King VL, Kidorf M, Schmidt CW, Jr., Bigelow GE. Psychiatric and substance use comorbidity among treatment-seeking opioid abusers. Arch Gen Psychiatry 1997;54:71–80.
3. Metzger D, Woody G, De Philippis D, McLellan AT, O'Brien CP, Platt JJ. Risk factors for needle sharing among methadone-treated patients. Am J Psychiatry 1991;148:636–640.
4. Taylor G, Parker J, Bagby M. A preliminary investigation of alexithymia in men with psychoactive substance dependence. Am J Psychiatry 1990;147:1228–1230.
5. Ravda E, Vaglum P. Psychopathology, treatment completion and 5 years outcome. J Subst Abuse Treat 1998; 15:135–142.
6. Charney DA, Paraherakis AM, Negrete JC, Gill KJ. The impact of depression on the outcome of addictions treatment. J Subst Abuse Treat 1998;15:123–130.
7. Maremmani I, Zolesi O, Aglietti M, Marini G, Tagliamonte A, Shinderman M, Maxwell S. Methadone dose and retention during treatment of heroin addicts with Axis I psychiatric comorbidity. J Addict Dis 2000; 19:29–41.
8. Cacciola JS, Alterman AI, Rutherford MJ, McKay JR, Mulvaney FD. The relationship of psychiatric comorbidity to treatment outcomes in methadone maintained patients. Drug Alcohol Depend 2001;61: 271–280.
9. Adelson M, Hayward R, Bodner G, Gelkopf M, Bleich A, Kreek MJ. Replication of an effective opiate addiction pharmacotherapeutic treatment model: Minimal need for modification to a different country. J Maintenance Addictions 2001;1: 5–13.
10. DoleVP, Nyswander ME, Kreek MJ. Narcotic blockade. Arch Intern Med 1966;118:304–309.
11. CSAT, Center for Substance Abuse Treatment. State methadone treatment guidelines. Treatment Improvement Protocol series 1. Rockville, MD: U.S. Department of Health and Human Services, 1993.
12. First MB, Spitzer RL, Gibbon M, Williams JBW. Structured Clinical Interview for DSM-IV-TR Axis I Disorders, Research Version, Patient Edition (SCID-I/P). New York: Biometrics Research, New York State Psychiatric Institute, November 2002.
13. Zanarini MC, Skodol AE, Bender D, Dolan R, Sanislow C, Schaefer E, et al. The collaborative longitudinal personality disorders study: Reliability of axis I and II diagnoses. J Personal Disord 2000;14:291–299.
14. Derogatis L. SCL-90-R: Administration, scoring and procedures: Manual 1. Baltimore, MD: Clinical Psychometric Research. 1977.
15. Hawks RL. Analytical methodology. In: Hawks RL, Chiang CN, editors. Urine testing for drugs of abuse. NIDA Research Monograph 1986;73:30–42.
16. Cacciola J, Griffith J, McLellan TA. ASI: Instruction Manual, 4th ed. Washington, DC: Veterans Administration, 1983.
17. McLellan AT, Luborsky L, Cacciola J, Griffith J, Evans F, Barr HL, O'Brien CP. New data from the Addiction Severity Index. Reliability and validity in three centers. J Nerv Ment Dis 1985;173:412–423.
18. Bleich A, Gelkopf M, Schmidt V, Hayward R, Bodner G, Adelson M. Correlates of benzodiazepine abuse in methadone maintenance treatment. A 1-year prospective study in an Israeli clinic. Addiction 1999;94:1533–1540.
19. Shalev A, Abramovitz M., Kaplan-de-Nour A. Structured clinical interview for axis 1 DSM-IV disorders. Patient edition (Hebrew version). Center for Traumatic Stress, Dept. of Psychiatry, Hadassah University Hospital, Jerusalem, Israel, 1994.

20. Rounsaville BJ, Weissman MM, Kleber H, Wilber C. Heterogeneity of psychiatric diagnosis in treated opiate addicts. Arch Gen Psychiatry 1982;39:161–168.
21. Bleich A, Gelkopf M, Weizman T, Adelson M. Benzodiazepine abuse in a methadone maintenance treatment clinic in Israel: Characteristics and a pharmacotherapeutic approach. Isr J Psychiatry Rel Sci 2002;39:104–113.
22. Gelkopf M, Bleich A, Hayward R, Bodner G, Adelson M. Characteristics of benzodiazepine abuse in methadone maintenance treatment patients: A 1-year prospective study in an Israeli clinic. Drug Alcohol Depend 1999;55:63–68.
23. Rounsaville BJ, Kosten TR, Weissman MM, Kleber HD. Prognostic significance of psychopathology in treated opiate addicts. A 2.5-year follow-up study. Arch Gen Psychiatry 1986;43:739–745
24. Woody GE, Luborsky L, McLellan AT, O'Brien CP, Beck AT, Blaine J, Herman I, Hole A. Psychotherapy for opiate addicts. Does it help? Arch Gen Psychiatry 1983; 40:639–645.
25. Maremmani I, Zolesi O, Agueci T, Castrogiovanni P. Methadone doses and psychopathological symptoms during methadone maintenance. J Psychoactive Drugs 1993;25:253–256.
26. McLellan AT, Luborsky L, Woody GE, O'Brien CP, Druley KA. Predicting response to alcohol and drug abuse treatments. Role of psychiatric severity. Arch Gen Psychiatry 1983;40:620–625.
27. Kleber HD, Gold MS. Use of psychotropic drugs in treatment of methadone maintained narcotic addicts. Ann N Y Acad Sci 1978;311:81–98.
28. Treece C, Nicholson B. DSM-II Personality type and dose levels in methadone maintenance patients. J Nerv Ment Dis 1980;168:621–628.