

Personality Traits and Psychopathology in Nicotine and Opiate Dependents Using the Gateway Drug Theory

Bahareh Amirabadi

Shahid Beheshti University of Medical Science, Tehran, Iran

Neda Alibeigi

University of Social Welfare and Rehabilitation Sciences, Tehran, Iran

Mohammad Nikbakht

Shahid Beheshti University of Medical Science, Tehran, Iran

Omid Massah; Ali Farhoudian* ; Younes Doostian

Substance Abuse and Dependence Research Center

University of Social Welfare and Rehabilitation Sciences, Tehran, Iran

Objectives: According to the gateway drug theory, tobacco use is a predisposing factor for future substance abuse. This study was conducted to compare nicotine and opiate dependents to identify the differences between their personality traits and psychopathology that makes them turn to other substances after cigarette smoking.

Methods: A causal-comparative study was conducted. Three groups were randomly selected: nicotine dependents, opiate dependents and ordinary individuals (non-dependent population). Cloninger's Temperament and Character Inventory-Revised, the Fagerstrom Test for Nicotine Dependence, Maudsley Addiction Profile, the Beck Depression Inventory, and Beck Anxiety Inventory were used to collect data. Analysis of variance was used to analyze data.

Results: Opiate dependents had higher 'novelty seeking' and lower 'cooperativeness' scores as compared to the other two groups. They also had higher anxiety and depression scores than the other two groups.

Discussion: Higher 'novelty seeking' and lower 'cooperativeness' scores are important personality traits predicting future substance abuse.

Keywords: Opiate substances, Nicotine, Temperament, Character

Submitted: 10 January 2015

Accepted: 21 February 2015

Introduction

Substance abuse or dependence results from a constellation of contributing factors such as social and familial issues, substance availability and personal interest (1,2). Personality is another element that may play an important role in predisposition, acceleration, and/or sustainability of substance abuse or dependence behaviors. Personality disorders are often observed among substance abusers, both in the clinical population (3,4) and in the non-clinical population (5-7). In many studies, the high comorbidity between drug dependence with mental disorders and personality traits (mainly depression, anxiety and antisocial and borderline personality disorders) have been reported (8). Moreover,

personality is a significant clinical trait that affects smoking habits and may also influence nicotine discontinuation (9). The important point is that cigarette smoking is an influential and powerful factor in future abuse of illicit substances. The Gateway Drug Theory is concerned with this very issue. According to this theory, using a softer drug will eventually lead to the use of a harder drug. One of the factors that make a person abuse illicit substances after cigarette smoking and recognizes cigarette as a gateway drug is one's personality traits. The reason why some individuals begin to abuse illicit substances after cigarette smoking and some don't can be explained by the difference in their personality traits (10,11).

* All correspondences to: Ali Farhoudian, email: <farhoudian@yahoo.com>

Cloninger's psychobiological model of personality is unique with regards to substance abuse and cigarette smoking. The study connecting personality and substance choice is important for designing optimal solutions in preventive services, as personality may be connected to specific biochemical mechanisms that can be applied to understand the complexities of addiction behaviors (12). Bishry and her colleagues indicated that there is a positive correlation between novelty seeking, persistence, cooperativeness, and motivation to quit smoking, whereas there is no correlation between harm avoidance, reward dependence, self-directedness, and self-transcendence in the motivation to quit smoking. They concluded that certain personality profile can affect motivation to quit smoking (13). Other research showed that smoking is associated with temperament and character dimensions, particularly novelty seeking, in young adulthood (14). This study aimed to compare personality traits in opiate and nicotine dependent individuals to identify those traits that differentiated between the people who abused other substances after cigarette smoking and those who did not.

Methods

A causal-comparative study was conducted. Forty five subjects were randomly selected from those attending a 'Center for Smoking Cessation' who were diagnosed by the center's physician and the Fagerstrom test as nicotine dependent. The Fagerstrom test had a high Intraclass Correlation Coefficient (ICC) of 0.75 and a reliability of 0.65-0.74 (15). The inclusion criteria were absence of severe psychological disorders and absence of dependence on various substances. These individuals did not have withdrawal symptoms and more than 6 months had passed since their treatments. Then, the following questionnaires were completed by the subjects: Cloninger's Temperament and Character Inventory (inter-rater

reliability = 0.80 - 0.89) (16), the Revised version of the TCI (inter-rater reliability = 0.82) (17), the Beck Depression Inventory (internal consistency = 0.86) (18), and Beck Anxiety Inventory (validity = 0.72, reliability = 0.83) (19). Then, 45 subjects were randomly selected from 4 Drug Addiction Treatment Centers who were diagnosed by the physician and the 'Maudsley Addiction Profile' questionnaire (correlation coefficient=0.80, reliability=0.65-0.74) (20) as substance dependent. The inclusion criteria were the same as the nicotine dependent group. Then, the TCI, BDI and BAI were administered. At the same time, 45 persons from the general population (non-dependent) were examined by the same three aforementioned questionnaires, i.e. TCI, BDI and BAI. The inclusion criteria for this group were lack of a severe psychological disorder and absence of dependence on nicotine and other substances. At the beginning of the sampling, all three groups went through a structured interview on the basis of the DSM-IV-TR (SCID). Data were analyzed with SPSS 16 and multivariate analysis of variance (MANOVA). As ethical considerations, all the information related to the participants remained confidential. The participants were handed their own results upon demand.

Results

The three groups were homogenous age-wise (mean=33.37 years). Significant differences were observed between the groups in terms of education. The opiate-dependent group scored lower than the other two groups. The novelty seeking dimension of personality significantly differed among the three groups. Table (1) illustrates that this dimension was higher in the opiate-dependent group than in the other two groups (P=0.000). The cooperativeness dimension too differed significantly among the three groups. It was lower in the opiate-dependent group than the other two groups.

Table 1. A comparison of personality dimensions in the three groups

Group	Opiate dependents	Nicotine dependents	General population	MANOVA	P value between opiates & nicotine dependents	P value between opiates & the general population	P value between nicotine & the general population
Variable	Mean (Standard deviation)	Mean (Standard deviation)	Mean (Standard deviation)				
Novelty Seeking	86.08 (8.51)	79.33 (7.17)	80.60 (10.01)	0.000	0.000	0.000	0.48
Harm Avoidance	82.15 (6.11)	79.97 (6.53)	80.00 (9.26)				
Reward Dependence	75.55 (6.47)	76.13 (7.82)	77.91 (7.81)	0.48	0.36	0.82	0.25

Group	Opiate dependents	Nicotine dependents	General population	MANOVA	P value between opiates & nicotine dependents	P value between opiates & the general population	P value between nicotine & the general population
Variable	Mean (Standard deviation)	Mean (Standard deviation)	Mean (Standard deviation)				
Persistence	1.04 (10.43)	1.07 (11.16)	1.05 (11.40)	0.52	0.26	0.67	0.48
Self-Directedness	91.42 (8.39)	89.73 (12.24)	91.97 (8.99)	0.54	0.42	0.79	0.29
Cooperativeness	87.46 (6.25)	97.06 (6.48)	97.04 (7.96)	0.000	0.000	0.000	1.00
Self-Transcendence	74.33 (8.91)	76.88 (8.69)	74.75 (10.10)	0.37	0.19	0.82	0.27

Significant differences were observed between the three groups in the anxiety and depression variables. Anxiety and depression were significantly higher in

the opiate-dependent group than in the other two groups (table 2) (P=0.000).

Table 2. A comparison of anxiety and depression in the three groups

Group	Opiate dependents	Nicotine dependents	General population	P value	P value between opiates & nicotine dependent	P value between opiates & the general population	P value between nicotine & the general population
Variable	Mean (Standard deviation)	Mean (Standard deviation)	Mean (Standard deviation)				
Depression	24.24 (12.89)	16.86 (13.46)	14.80 (8.59)	0.000	0.000	0.000	0.41
Anxiety	43.48 (14.89)	33.73 (9.00)	38.06 (12.55)	0.000	0.000	0.04	0.10

Discussion

Based on the results, the two dimensions of novelty seeking and cooperativeness were significantly different among the three groups. Novelty seeking represents an inherent orientation toward beginning or activating a response to novelty, an approach toward reward cues, active avoidance of conditioned cues of punishment, and escape from unconditioned punishment. This dimension is observed as an exploratory activity in response to novelty, impulsivity, an excessive approach toward reward cues, extremism and chaos, accelerated boredom and tiredness, and active avoidance of failure (21). Different neurotransmitters are involved in the dimensions of temperament. The neurotransmitter for novelty seeking is dopamine, which is a regulator for reward. The behavioral responses generated from novelty seeking are: exploratory behaviors, craving, active avoidance and escape. Therefore, opiate dependent individuals have such traits as extreme approach towards reward cues, impulsivity, searching for novelty and follow-up of reward cues that differentiate them from the other two groups. Many of these traits make the individual follow

reward cues, search for novelty and act impulsively. Impulsivity is a major trait of this dimension (22). Other studies have also confirmed that novelty is higher in substance dependent individuals than the general population, and at times it has even been higher than alcohol-dependents (23). Therefore, we may describe our results as such, that opiate dependent individuals have such traits as extreme approach towards reward cues, impulsivity, searching for novelty and follow-up of reward cues that differentiate them from the other two groups. Substances themselves are very strong reward stimulants and affect the brain's reward system. Substance abusers use substances to provide dopamine to the limbic system that is the brain's reward system (24). Moreover, these persons exhibit substance curious and substance-exploratory follow-up behavior, actively avoid withdrawal signs (that include pain and unpleasant physical and mental conditions) and exhibit craving. Craving is a very important factor in substance abuse, withdrawal maintenance and relapse prevention. Substance abusers have a high level of craving, and greater craving is negatively associated with successful abstinence and cessation. This dimension of

personality traits was consistent with earlier studies in this field, such as those of Le Bon et al, Ball et al, Gabel et al, Evren et al, and Herrero et al (8,25-28). Furthermore, cooperativeness was significantly lower in the opiate dependent group as compared to the other two. Individuals who have a high level of this dimension consider themselves an inseparable part of the human society and are generally, empathic, patient, caring and kind, supportive and law-abiding. People with lower degrees of cooperativeness are self-absorbed, impatient, critical, vengeful and opportunistic. They usually do not help others and think of themselves first under whatever circumstances. Moreover, they have a tendency to be indifferent to other's feelings and rights. It seems natural that opiate dependents have lower cooperativeness. These individuals lack tolerance, do not adhere to principles, and ignore others' rights and feelings. What differentiates the nicotine dependent and non-dependent individuals from the opiate dependents is concerned with this dimension, characterized by their supportive & law-abiding nature, participation in group activities, empathy, kindness and patience. These findings are consistent with many studies performed earlier, such as those of Evren et al and Herrero et al (27,28). High novelty-seeking and low cooperativeness in substance dependent individuals are two differentiating traits. Karami et al showed difference in novelty seeking, harm avoidance, persistence, cooperativeness, self-directiveness, and self-transcendence among drug users (29). According to Evren et al high novelty seeking was an outstanding trait of class B personality disorders, i.e. the same class of the antisocial personality disorder. So substance dependent individuals who have higher novelty seeking may also have signs of antisocial personality disorder as well (27). Le Bon et al discovered that heroin abusers' personality profiles showed much higher antisocial personality traits than

alcohol users (9). According to Evren et al most people with personality disorders have low cooperativeness scores. In the aforementioned study, low reward dependence was recognized as a class A characteristic, high reward-novelty seeking was a characteristic of class B and high harm-avoidance was characteristic of class C personality disorders (27). Many patients seeking treatment for addiction are diagnosed with other syndromes like depression (Axis I) or personality disorder (Axis II) or both. Depression and anxiety disorders are the most common disorders associated with substance abuse and dependence. About one third to half of opiate-like substance dependent/abusing individuals and 40% of alcohol dependent/abusing individuals fulfill the diagnostic criteria of major depression once in their lifetime (1). In our study, depression and anxiety were higher in the opiate-dependent group than the other two groups. This finding is consistent with that of Gabel et al (26). Substance dependence is associated with bodily and mental changes, which may be one of the main causes of depression and anxiety among substance dependent individuals. Having gone through the withdrawal period may be another reason why substance dependent individuals score high in depression and anxiety.

Conclusion

Higher 'novelty seeking' and lower 'cooperativeness' scores in opiate dependents are among important personality traits predicting future substance abuse. This should be considered seriously, especially in nicotine dependent youth.

Conflict of Interests - The authors have no conflict of interests.

Acknowledgment

The authors thank all the patients who participated and cooperated in this research.

References

1. Sadock BJ. Kaplan and Sadock's Comprehensive Textbook of Psychiatry. 9th ed. London: Wolters Kluwer Health/Lippincott Williams & Wilkins; 2012.
2. Kring AM, Johnson SL, Davison GC, Neale JM. Abnormal Psychology. 11th ed. NJ: Wiley; 2012.
3. Verheul R. Co-morbidity of personality disorders in individuals with substance use disorders. *European Psychiatry*. 2001;16(5):274-82.
4. Craig RJ. Prevalence of personality disorders among cocaine and heroin addicts. *Substance Abuse*. 2000;21(2):87-94.
5. Compton WM, Conway KP, Stinson FS, Colliver JD, Grant BF. Prevalence, correlates, and comorbidity of DSM-IV antisocial personality syndromes and alcohol and specific drug use disorders in the United States: results from the national epidemiologic survey on alcohol and related conditions. *Journal of Clinical Psychiatry*. 2005.
6. Grant BF, Stinson FS, Dawson DA, Chou SP, Ruan WJ, Pickering RP. Co-occurrence of 12-month alcohol and drug use disorders and personality disorders in the United States. *Alcohol Research & Health*. 2006;29(2):121-30.
7. Franques P, Auriacombe M, Tignol J. [Addiction and personality]. *Encephale*. 1999;26(1):68-78.
8. Beck AT, Wright FD, Newman CF, Liese BS. *Cognitive Therapy of Substance Abuse*. First ed. USA: Guilford

- Publications; 2011.
9. Le Bon O, Basiaux P, Streele E, Tecco J, Hanak C, Hansenne M, et al. Personality profile and drug of choice; a multivariate analysis using Cloninger's TCI on heroin addicts, alcoholics, and a random population group. *Drug and alcohol dependence*. 2004;73(2):175-82.
 10. Leventhal AM, Waters AJ, Boyd S, Moolchan ET, Heishman SJ, Lerman C, et al. Associations between Cloninger's temperament dimensions and acute tobacco withdrawal. *Addictive behaviors*. 2007;32(12):2976-89.
 11. Grant BF. Age at smoking onset and its association with alcohol consumption and DSM-IV alcohol abuse and dependence: results from the National Longitudinal Alcohol Epidemiologic Survey. *Journal of substance abuse*. 1998;10(1):59-73.
 12. Kandel DB, Yamaguchi K, Chen K. Stages of progression in drug involvement from adolescence to adulthood: further evidence for the gateway theory. *Journal of Studies on Alcohol and Drugs*. 1992;53(5):447-57.
 13. Bishry Z, Fekry M, El Shahawy H, Soltan M, Haroun A, Moneim DA. The role of personality profile in the motivation to quit smoking. *Middle East Current Psychiatry*. 2012;19(4):206-13.
 14. Ravaja N, Keltikangas-Järvinen L. Cloninger's temperament and character dimensions in young adulthood and their relation to characteristics of parental alcohol use and smoking. *Journal of Studies on Alcohol and Drugs*. 2001;62(1):98-104.
 15. Azizi A, Mirzaei A, Shams J. Correlation between Distress Tolerance and Emotional Regulation With Students Smoking Dependence. *Hakim Research Journal*. 2010;13(1):11-8.
 16. Dzamonja-Ignjatovic T, Svrakic DM, Svrakic N, Jovanovic MD, Cloninger RC. Cross-cultural validation of the revised temperament and character inventory: Serbian data. *Comprehensive psychiatry*. 2010;51(6):649-55.
 17. Ayati M. Dimensional Structure of Major Depression Period Symptoms and It's Relationship with Temperament and Character. Tehran: University of Social Welfare and Rehabilitation Sciences; 2011.
 18. Lotfi-Afshar S, Ashayeri H, Gilani B, Ghasemzadeh H. Implicit and Explicit Memory's Bias in Anxious and Depressed Patients. *Iranian Journal of Psychiatry & Clinical Psychology*. 1998;12:36-47.
 19. Hossein Kaviani H, Mousavi A S. Psychometric properties of the Persian version of Beck Anxiety Inventory (BAI). *Tehran University Medical Journal*. 2008;66(2):136-40.
 20. Marsden J, Gossop M, Stewart D, Best D, Farrell M, Lehmann P, et al. The Maudsley Addiction Profile (MAP): a brief instrument for assessing treatment outcome. *Addiction*. 1998;93(12):1857-67.
 21. Bardo MT, Donohew RL, Harrington NG. Psychobiology of novelty seeking and drug seeking behavior. *Behavioural Brain Research*. 1996;77(1):23-43.
 22. Joseph JE, Liu X, Jiang Y, Lynam D, Kelly TH. Neural correlates of emotional reactivity in sensation seeking. *Psychological Science*. 2009;20(2):215-23.
 23. Martin SB, Covell DJ, Joseph JE, Chebrolu H, Smith CD, Kelly TH, et al. Human experience seeking correlates with hippocampus volume: convergent evidence from manual tracing and voxel-based morphometry. *Neuropsychologia*. 2007;45(12):2874-81.
 24. Mathias R. Novelty Seekers and Drug Abusers Tap Same Brain Reward System, Animal Studies Show. *NIDA; Prevention Research*. 1995;10(4):284-96.
 25. Ball SA, Kranzler HR, Tennen H, Poling JC, Rounsaville BJ. Personality disorder and dimension differences between type A and type B substance abusers. *Journal of Personality Disorders*. 1998;12(1):1-12.
 26. Gabel S, Stallings MC, Schmitz S, Young SE, Fulker DW. Personality dimensions and substance misuse: Relationships in adolescents, mothers and fathers. *The American Journal on Addictions*. 1999;8(2):101-13.
 27. Evren C, Evren B, Yancar C, Erkiran M. Temperament and character model of personality profile of alcohol-and drug-dependent inpatients. *Comprehensive psychiatry*. 2007;48(3):283-8.
 28. Herrero MJ, Domingo-Salvany A, Torrens M, Brugal MT, Gutierrez F. Personality profile in young current regular users of cocaine. *Substance use & misuse*. 2008;43(10):1378-94.
 29. Karami Z, Pirkhaefi A, Kowsarnia A, Massah O, Farhoodian A. Comparison of Personality Traits Based on Temperament and Character Inventory (TCI) in Opiate and Stimulant Abusers. *Quarterly Journal of Rehabilitation*. 2014;14(5):83-90.