



A case of a depressive patient with alcohol and nicotine dependence successfully treated with sertraline

Wakako Umene-Nakano, M.D., Ph.D., Reiji Yoshimura, M.D., Ph.D.,
Asuka Katsuki, M.D. and Jun Nakamura, M.D., Ph.D.

*Department of Psychiatry, School of Medicine, University of
Occupational and Environmental Health, Japan*

ABSTRACT

Multiple studies have reported that tobacco smoking, alcohol use, and depression are interrelated. Here we report a case of a 54-year old male depressive patient with comorbid alcohol and nicotine dependence who was successfully treated with sertraline. After treatment with sertraline, the patient's plasma levels of MHPG and HVA were increased, but his serum BDNF level was. Sertraline exhibits more potent efficacy than other SSRIs in inhibiting dopamine reuptake. This unique effect of sertraline on catecholamine systems contributed to the successful outcome in this case.

Keywords: *depression, alcohol dependence, nicotine dependence, sertraline, smoking cessation*

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INTRODUCTION

Multiple studies have demonstrated that tobacco smoking, alcohol use, and depression are interrelated. Patients with mood disorders have higher rates of smoking and greater difficulty quitting smoking [1]. Smokers are more likely to consume alcohol, and those with alcohol problems experience greater difficulty quitting smoking [2]. Both smoking and alcohol abuse are associated with depression, and there are certain psychobiological mechanisms of co-morbidity among the three factors [3]. Here we present a case of a depressive patient with alcohol and nicotine dependence successfully treated with sertraline. The authors also longitudinally followed up the plasma levels of homovanillic acid (HVA), a major metabolite of dopamine, and 3-methoxy-4-hydroxyphenylglycol (MHPG), a major metabolite of noradrenaline and brain-derived neurotrophic factor (BDNF), in this case.

CASE PRESENTATION

Mr. A, a 54-year-old man, met the DSM-IV criteria for major depression, alcohol dependence, and nicotine dependence. He had developed a major depressive disorder and alcohol dependence because of stress from work 1 year prior to coming to our program for consultation. His depressive symptoms consisted of depressed mood, irritability, insomnia, loss of appetite, feelings of guilt, markedly diminished interest and pleasure in almost all activities, difficulty concentrating, and suicidal thoughts. His score on the Hamilton Rating Scale for Depression was 20. He had been experiencing nicotine dependence for many years and smoked 30 cigarettes per day. His score on the Fagerstrom Test for nicotine dependence was 10 and therefore consistent with a physical syndrome of nicotine dependence. His score on the alcohol use disorders identification test was 18. He was admitted to our

Corresponding Author: Wakako Umene-Nakano, M.D., Ph.D., Department of Psychiatry, School of Medicine, University of Occupational and Environmental Health, 1-1 Iseigaoka, Yahatanishi-ku, Kitakyushu, Fukuoka 8078555, Japan

Tel.: +81936917253 Fax: +81936924894 E-mail: wakako-u@med.uoeh-u.ac.jp

psychiatric ward. He had never received any psychiatric treatment or medication before this admission. He was treated with sertraline 25 mg/day for a few weeks, and with nicotine patches, at 30 mg/day, for one week. He also received cognitive behavior therapy for alcohol dependency. His depressive symptoms improved after 10 weeks. His score on the Hamilton Rating Scale for Depression fell to 7 when his sertraline dose was increased to 100 mg/day, and he succeeded in quitting smoking and drinking after 10 weeks of treatment with sertraline. His plasma levels of HVA and MHPG were 5.7 ng/ml and 3.1 ng/ml before treatment, 5.6 ng/ml and 5.4 ng/ml 2 weeks after treatment, 5.0 ng/ml and 7.9 mg/ml 4 weeks after treatment, and 7.8 ng/ml and 9.9 ng/ml 10 weeks after treatment. His serum levels of BDNF before and at 2, 4, and 10 weeks after treatment were 1.4 ng/ml, 1.8 ng/ml, 2.2 ng/ml, and 1.8 ng/ml, respectively. We measured serum levels of MHPG and HVA by high-performance liquid chromatography, and we measured serum BDNF levels by ELISA. The CV (intra- and inter-assay) of MHPG, HVA, and BDNF were all below 10%.

DISCUSSION

A number of behavioral and pharmacological treatments, such as nicotine replacement therapy and administration of varenicline and antidepressants, have been shown to aid smoking cessation [4, 5]. Among antidepressants, bupropion and nortriptyline have been proposed for the treatment of nicotine dependence [6]. Bupropion inhibits neuronal noradrenaline (NA) and dopamine (DA) reuptake and is thought to reduce tobacco withdrawal symptoms by enhancing central DA concentrations. Clinical studies showed that bupropion is effective in both initial smoking cessation and relapse prevention. Among SSRIs, sertraline is only one of several antidepressant medications that have been tested as treatments for nicotine dependence. This line of research was spurred by observations of the deleterious influence of depressed mood [7, 8] and major depressive disorder [9] on cessation. Sertraline inhibited dopamine transporter more successfully than did other SSRIs [10].

We have reported that sertraline plays an important role in clinical efficacy in treating depressive patients [11]. In contrast, Covey *et al.* [12] reported unsuccessful results in using sertraline for smoking cessation. Among patients who develop problem drinking early in life, have a strong family history of

alcoholism, and frequently exhibit impulsive behaviors, fluoxetine worsens drinking outcomes [13]. In contrast, sertraline improves drinking outcomes among patients who develop problem drinking later in life and do not have a family history of impulsive behavior [14]. In the present case, the plasma MHPG and HVA levels increased, and the serum BDNF level did not change after treatment with sertraline. We have previously reported that serum BDNF levels did not increase after treatment with varenicline for 8 weeks in smokers [15]. Taking these findings into account, although pharmacotherapeutic approaches to comorbidity of depression and alcohol and nicotine dependence have not been established, sertraline is a candidate drug for the treatment of such patients via enhancement of the catecholaminergic system without affecting BDNF.

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