The Study of Concentration of Urine Neurotransmitters of Dopaminergic and Serotonergic System and the Relationship to Behavioral Disorders in Patients with Online Game Addiction

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Aims: To evaluate concentration of urine neurotransmitters of dopaminergic and serotonergic system and relationship to behavioral disorders in students with online game addiction. Materials and Methods: A study of 51 high school students (aged from 15-17, chosen from 200 playing game students) diagnosed as online game addiction according to American Psychological Association and 50 healthy students as a controlled group. Eye contact time, behavioral disorders were determined. Urine of game addiction students was taken after 45 minutes playing game. Level of urine dopamine, Homovanillic Acid (HVA), serotonin and 5- Hydroxyindoleacetic acid (5-HIAA) was measured using ultra performance liquid chromatography - tandem mass spectrometer (UPLC-MS/MS) method. Results: The ratio of game addiction students was 25.5%. In the game addiction students, the ratio of behavioral disorders was higher, average eye contact time was shorter than those of the controlled group, $p< 0.05$. Concentration of urine dopamine and serotonin of game addiction group was higher, but level of urine HVA and 5-HIAA (final products of dopamine and serotonin) were lower than those of the controlled group, $p< 0.001$. In the game addiction group, the ratio of behavioral disorders of the students with decreased HVA and 5-HIAA levels was higher than that of normal HVA, 5-HIAA levels, $p<0.05$. There was a close relation between low level of urine dopamine, HVA, serotonin and 5-HIAA and long duration of game addiction, $p< 0.01$. Conclusions: Concentration of urine dopamine, serotonin increased while urine HVA and 5-HIAA decreased during playing game. The change of level of urine dopamine, HVA, serotonin and 5-HIAA related to behavioral disorders of online game addiction patients.

Awards Won:
National Institute on Drug Abuse, National Institutes of Health &amp the Friends of NIDA: Honorable Mention