Response Paper 2

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For most of this semester we have been discussing in class the psychopharmacology of illicit drugs. Last week we discussed the drug Cannabis, more commonly known as marijuana. This is classified as a class 1 substance, meaning that it is highly controlled and regulated by the government. Despite the harsh punishment for its use, the long-term effects of this drug are not well known, aside from the possibility of some weight gain and long term memory impairments. Near the beginning of the semester we discussed psychedelic drugs, possession of which can lead to several years spent in jail. The short-term effects of some of these drugs, such as MDMA, include empathy and enhanced communication. The long term effects are very minor; there is little evidence of any impaired cognitive functioning, and very little chance of physical dependence, if any.

This week we discuss the drugs associated with anxiety relief. These drugs are freely prescribed by physicians and used by a large amount of the population; 2.5% of the adult population is prescribed benzodiazepines for either their anxiolytic or hypnotic effects. Amazingly, the negative effects of these drugs seem to be much harsher than many class 1 drugs, the use of which is so strictly punished. For example, dependence on benzodiazepines (much more commonly used than barbiturates) occurs in 10% of users. This occurs likely because these medications are meant to be taken for only about a month, yet the median usage time is almost 2 years. When withdrawing from benzodiazepines, patients can suffer from a return of anxiety, insomnia rebound, agitation, and in some severe circumstances, psychoses and seizures.

The dependence and withdrawal symptoms of benzodiazepines are not even the most startling aspects of the medications. More importantly is the fact that these drugs can induce severe impairments in cognition, memory, attention, reaction time, and psychomotor function. Large amounts of people in the United States are using these drugs every day, and suffering from impaired motor and cognitive abilities as a result. Additionally, these medications often cause severe anterograde amnesia; in fact, the common date rape drug rohypnol is a type of benzodiazepine. Most of the issues involving benzodiazepines arise because of their function as GABA agonists. Changing the balance of a neurotransmitter as essential and omnipresent as GABA is a dangerous task. Interestingly enough, GABA is not the only neurotransmitter implicated in anxiety.

Corticotropin-Releasing Factor (CRF) plays a large role in the anxiety response. It begins a pathway that finishes with physiological changes that help adapt to environmental challenges. This is of course a necessary process, but in patients with anxiety it becomes overused. In fact, combat veterans with PTSD have higher CRF levels in their cerebrospinal fluid than combat veterans without PTSD. This is only one of many direct links between CRF and anxiety. Interestingly, researchers have found that many anxiety effects can be prevented by pretreatment with CRF antagonist α-helical CRF9-14. Instead of continuing to prescribe the cognitively dangerous benzodiazepines, scientists could do more research into the efficacy of using CRF antagonists to control anxiety.

The literature surrounding serotonin and anxiety is very strong, meaning that serotonin related drugs are very commonly used in cases of anxiety. However, fully understanding the effects of SSRIs on anxiety-producing mechanisms is almost impossible due to the large number of serotonin receptor subtypes. SSRIs are clinically proven to be effective in reducing anxiety; however, depleting tryptophan (the precursor to serotonin) does not consistently increase anxiety. Additionally, depending on the model of anxiety used, 5-HT agonists either increase or decrease anxiety. The effects of SSRIs on anxiety are evidently incredibly varied, likely due to the subtype of 5-HT receptor used in specific anxiety-producing circumstances. However, this does not mean that SSRIs are any less effective than benzodiazepines. They have a better rate of efficacy, as well as fewer negative cognitive side effects. In fact, benzodiazepines seem to be the worst possible choice in treating anxiety disorders. As Julien states, “perhaps the only well-accepted situation in which benzodiazepines cannot readily be replaced by other drugs is the intentional production of anterograde amnesia”. Given this information, we must ask ourselves—why are benzodiazepines still in use at all?