

Review Article

Shifting the Autonomic Nervous System balance and Addiction Recovery

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Abstract

It has been shown that a person with Substance Use Disorder (SUD) undergoes a shift in the balance of their Autonomic Nervous System when they get into recovery. We suggest that a person with an active SUD can get into recovery by rebalancing their Autonomic Nervous System (ANS). After mentioning treatment methodologies where this has been reported, we discuss alternative ways of rebalancing the ANS which might support recovery. We also suggest a low cost treatment experiment to verify the concept.

Keywords: Autonomic; Nervous System; Rebalance; Recovery; Shift; Substance Use Disorder; Treatment

Mudie [1] showed that the different methods that people have used to promote recovery from Substance Use Disorders (SUD) all seem to produce a change in the Autonomic Nervous System (ANS). He observed that a person suffering from a SUD has a dominating Sympathetic Nervous System (SNS). The SNS is characterized by feelings of anger, fear and tendencies to fight or flee [2,3]. The recovering person has a more active Parasympathetic Nervous System (PSNS) which is characterized by feelings of serenity, humility, calm, lack of fear, connection, acceptance, and a tendency to care for others. He reported that the underlying feature of all methods of recovery from SUD's are ways to increase the activity of the PSNS.

In this paper we propose that just the act of shifting the balance of the ANS from an active SNS to a more active PSNS is a necessary and sufficient condition to promote recovery from a SUD.

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Methods of Shifting the ANS known to Support Recovery

Meditation

Wu and Lo [4] showed that inward-meditation increased PSNS activity and Chiesa A, Serretti A [5] stated "Our review suggests that Mindfulness-based interventions" can result in reduced consumption of several substances including alcohol, a range of types of drugs, smoke, and opiates to a significantly higher extent than waitlist controls, non-specific educational support group, and some specific control group.

Garland et al., [6] showed that a meditation practice (MORE) improved the recovery of chronic opioid users. As meditation has been shown to activate the PSNS [4] this can be interpreted as showing that deliberate shifting of the ANS by meditation can improve the recovery from a SUD, in this case opioid use disorder.

Nijjar et al., [7] suggested that Mindfulness Based Stress Reduction (MBSR) training improved sympatho-vagal balance, the use of MBSR [8] has been shown to reduce craving.

Known Methods of Shifting the Balance of the ANS that Might Enhance Recovery

Aromatherapy

Chang and Shen [9] stated "After two ten-minute aromatherapy sprays with Bergamot essential oil on elementary school teachers, the parasympathetic nervous system was enhanced".

Watanabe et al., [10] stated when inhaling Bergamot dissolved in water vapor "the HF component of the heart rate variability, which is an indicator for the function of the parasympathetic nervous system, significantly increased".

Chien et al., [11] stated that "The study demonstrated that lavender inhalation may have a persistent short-term effect on HRV with an increase in parasympathetic modulation".

Chiropractic

Welch and Boone [12] reported that "In this study, the findings after a cervical adjustment were linked to an increase in parasympathetic dominance".

Massage

Field [13] reported that a study when foot and hand massages were given to children who were hospitalized on a pediatric intensive care unit that during the massage, parasympathetic activity (as measured by vagal activity) increased by 75%.

Slow Deep Breathing

Jerath et al., [14] showed that slow breathing enhances parasympathetic activity. Slow breathing pranayama exercises showed a strong tendency of improving or balancing the autonomic nervous system.

through enhanced activation of parasympathetic nervous system. Specifically, with slow breathing pranayama there is a noted increase in parasympathetic activity and a decrease in sympathetic dominance.

Brook et al., [15] reported that device guided slow breathing was more successful than meditation in reducing blood pressure.

Pal GK., et al., [16] also found that "... increased parasympathetic activity and decreased sympathetic activity were observed in slow breathing group".

Suggestion for an Experimental Verification that Shifting the ANS can Enhance Recovery from an SUD.

Brook et al., [15] showed that device-guided breathing greatly reduced blood pressure perhaps by activating the PSNS. If this is true, then presumably device guided breathing would also support recovery from addictions. As the device used in the Brook et al., [15] report was manufactured by RESPeRATE (cost about \$370) the cost for ongoing treatment is minimal compared with treatment provided by residential treatment centers for SUD recovery.

Conclusion

We have proposed and shown that shifting the balance of the autonomic system from a more active SNS to a more active PSNS supports recovery from SUD's. We have described novel methods of shifting the balance and proposed a low-cost treatment that might enhance recovery from SUD's.

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