Case Report

Title

The Effect of MOZART GST on The Secretion of Oxytocin

Author

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Abstract

Oxytocin (OT), a neuropeptide known for its role in social bonding, trust, and emotional regulation, has gained significant attention in recent years. Various studies have explored the effects of different environmental stimuli on the secretion of OT, with external frequencies being one such stimulus of interest. This study aimed to investigate the effect of MOZART GST on the secretion of OT.

10 Participants mean age of 35 were recruited for this study. The participant listened to MOZART GST for 15 mins.

To measure OT secretion, salivary samples were collected from both groups before and after the intervention. Enzyme-linked immunosorbent assay (ELISA) was used to quantify the levels of OT in the collected samples.

Salivary OT levels were significantly increased after the intervention from 70.06.pg/ml±7.62 to 97.3pg/ml±14.09 (M±SE, n=10, $p < 0.05$)

These findings suggest that exposure to the specific compositions utilized in MOZART GST may have a direct impact on the secretion of oxytocin. Further research is warranted to explore the underlying mechanisms responsible for this effect and to determine the long-term implications of MOZART GST on social bonding, emotional well-being, and related physiological processes.

In conclusion, this study provides preliminary evidence supporting the notion that MOZART GST can modulate oxytocin secretion. The potential therapeutic applications of such interventions in promoting positive social interactions, reducing stress, and enhancing emotional regulation warrant further investigation.

Introduction

OT, a neuropeptide commonly referred to as the "love hormone," plays a vital role in social bonding, trust, and emotional regulation [1]. It has been implicated in a wide range of social behaviors, such as maternal-infant bonding, pair bonding, and prosocial behaviors [2, 3].

One area where the health benefits of OT have been extensively studied is stress reduction. OT has been shown to have stress-buffering effects by dampening the activity of the hypothalamic-pituitary-adrenal (HPA) axis and reducing the release of stress hormones such as cortisol [4]. Additionally, OT has been associated with increased resilience to stress and improved coping mechanisms [5].

OT also has implications for wound healing and tissue repair. Studies have demonstrated that OT can promote wound healing by accelerating the formation of new blood vessels and enhancing tissue regeneration [6, 7]. Furthermore, OT has been found to possess anti-inflammatory properties, aiding in the reduction of inflammation and facilitating the healing process [8].

In terms of cardiovascular health, OT has been linked to lower blood pressure and improved cardiac function. Research suggests that OT can dilate blood vessels, leading to enhanced blood flow and reduced blood pressure [9]. Moreover, OT has been associated with the modulation of heart rate variability, a marker of cardiovascular health and autonomic nervous system function [10].

Furthermore, OT is involved in various social and emotional processes that contribute to overall well-being. It has been implicated in the regulation of emotions, including the promotion of trust, empathy, and social bonding [11]. OT has also been associated with increased feelings of social support, reduced feelings of social anxiety, and improved interpersonal relationships [12, 13].

Overall, the health benefits of OT extend beyond its role in social bonding. Its involvement in stress reduction, wound healing, cardiovascular health, and emotional well-being suggests its potential as a therapeutic target in various health conditions. Further research is needed to fully understand the mechanisms underlying these effects and explore the potential clinical applications of OT.

Consequently, understanding the factors that influence OT secretion has become a subject of great interest in the fields of neuroscience and psychology.

OT release is influenced by various environmental stimuli, and music has emerged as a particularly intriguing stimulus in this regard [14]. Music has long been recognized for its profound ability to evoke emotions, elicit memories, and influence human cognition and mood [15]. Recent studies have explored the relationship between music and OT secretion, shedding light on the potential therapeutic applications of musical interventions in promoting social bonding, reducing stress, and enhancing emotional well-being.

The effects of music on OT secretion are multifaceted and can be influenced by several factors. One line of research has focused on the emotional content of music and its impact on OT release. For example, studies have shown that exposure to music with positive emotional valence leads to increased salivary OT levels compared to neutral or negative music conditions [16]. These findings suggest that music with uplifting and pleasant qualities may enhance OT secretion and contribute to positive emotional states.

Another aspect of music that has been investigated is its rhythmic and melodic components. Rhythmic entrainment, which occurs when individuals synchronize their movements to the beat of music, has been found to increase OT levels and promote feelings of connectedness and empathy [17]. Additionally, the melodic features of music, such as contour, pitch, and tonality, can evoke emotional responses and modulate OT release [18].

Furthermore, the engagement and active participation in music-making have been associated with higher OT levels compared to passive music listening. Active music-making activities, such as singing or playing a musical instrument, can elicit greater emotional engagement and social connectedness, leading to increased OT secretion [19].

In addition to music, another area of interest in understanding OT release is meditation practices. Certain forms of meditation, such as loving-kindness meditation and mindfulness-based practices, have been found to stimulate the secretion of OT. These meditative techniques involve cultivating feelings of compassion, love, and connection towards oneself and others, which are closely linked to the social bonding processes regulated by OT [20]. Research has shown that engaging in regular meditation practices focused on altruism and appreciation can lead to increased OT levels [21]. The activation of brain regions associated with empathy and positive emotions during meditation may contribute to the observed OT release [22]. Therefore, exploring the effects of meditation alongside music on OT secretion could provide valuable insights into the synergistic effects of these practices on social bonding, stress reduction, and emotional well-being.

The present study aims to contribute to this growing body of research by investigating the effect of external musical stimuli, specifically utilizing the MOZART GST which is a specialized music combined with high-speed inaudible affirmation. By examining the potential influence of MOZART GST on salivary OT levels, which are directly associated with plasma OT levels [23], we seek to provide comprehensive insights into the therapeutic applications of this musical intervention, particularly in the context of social bonding, stress reduction, and emotional well-being.

Material and Methods

1. Subjects:

A total of 10 healthy subjects (4 males and 6 females) with a mean age of 35 years were recruited to participate in the study. The selection of participants aimed to have a diverse sample in terms of gender representation and within an age range that is relevant to the study objectives.

2. Procedures:

The participants were instructed to listen to MOZART GST for a duration of 15 minutes. The MOZART GST compositions were carefully chosen for their emotional depth and potential to elicit a range of responses. The participants were provided with a comfortable listening environment, free from distractions, to ensure optimal engagement with the music. The duration of 15 minutes was selected to allow for an adequate exposure to the music while considering the attention span and comfort of the participants.

3. OT assessment

Prior to the commencement of the MOZART GST intervention, each participant was instructed to provide a saliva sample of 0.5 ml. This initial saliva collection served as a baseline measurement of OT levels. The intervention consisted of a 15-minute session of listening to MOZART GST.

Immediately after completing the intervention, a post-intervention saliva sample of 0.5 ml was collected from each participant using the same collection procedure. To preserve the integrity of the samples, the collected saliva was promptly stored at -20℃ until further assessment.

To quantify OT levels in the saliva samples, an enzyme-linked immunosorbent assay (ELISA) was employed using the OT ELISA kit (ADI-900-153A, Enzo Life Sciences, Farmingdale, NY), following the manufacturer's instructions. The ELISA plate was read on a microplate reader (Molecular Devices SpectraMax Plus384) at an optical density of 405nm. It is worth noting that the sensitivity range of this particular ELISA assay, as indicated by the manufacturer, is between 15 and 1000 pg/ml.

Results

The analysis of the results revealed an increase in OT levels after the administration of MOZART GST intervention. The mean OT level before the intervention was 70.06 pg/ml ± 7.62 (M±SE, n=10), while after the intervention, it rose to 97.3 pg/ml ± 14.09 (M±SE, n=10, p=0.009). Among the participants, 6 individuals exhibited significant increases in OT levels (more than 30 percent from the pretreatment levels), while 2 individuals showed minor increases (less than 10 percent). Conversely, 3 participants displayed reductions in OT levels after the intervention, with 1 individual experiencing a major reduction (more than 20 percent) and 2 individuals demonstrating minor reductions (less than 5 percent) (Figure 1).

Discussion

Despite the limited sample size in this study, the findings suggest that listening to MOZART GST for a short duration can lead to an increase in OT levels in the majority of subjects. Interestingly, it was observed that individuals who experienced a major increase in OT levels had prior exposure to MOZART GST for a significant period, ranging from three months or longer. On the other hand, the reduction group comprised individuals with little or no previous experience with MOZART GST. These preliminary observations indicate a potential relationship between prior exposure to the music and the magnitude of OT response. However, it is important to note that the study did not find any significant associations between changes in OT levels and age or sex.

To gain a deeper understanding of the mechanisms underlying the observed changes in OT levels and the potential effects of OT, further investigation is warranted. Future research should explore the specific neurobiological pathways through which musical stimuli, such as MOZART GST, modulate OT secretion. Additionally, it is crucial to investigate the broader implications of altered OT levels on social bonding, emotional well-being, and related physiological processes. Studies with larger sample sizes and diverse populations can provide more robust insights into the effects of music on OT and help elucidate the underlying mechanisms involved.

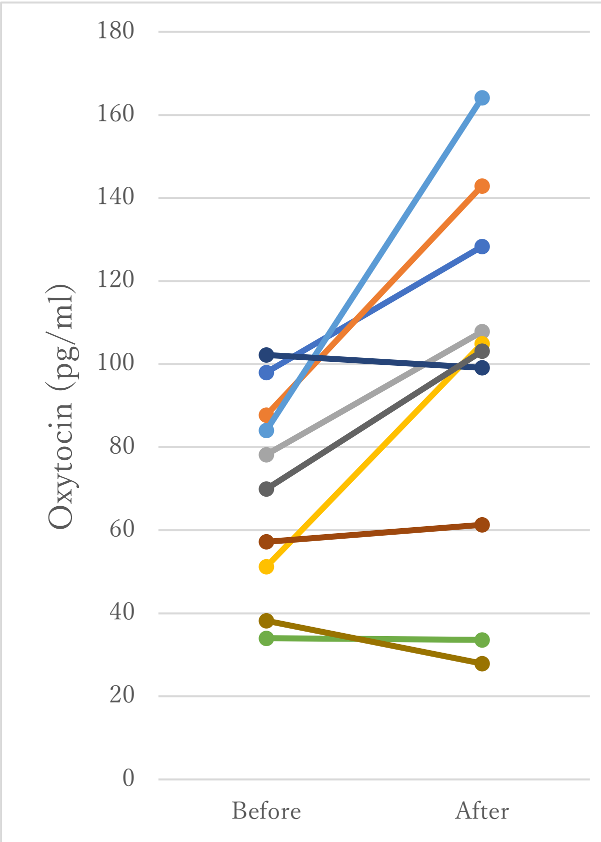

Figure 1. Salivary OT levels were significantly increased after MOZART GST from 70.06.pg/ml±7.62 to 97.3pg/ml±14.09 (M±SE, n=10, $p < 0.05$)

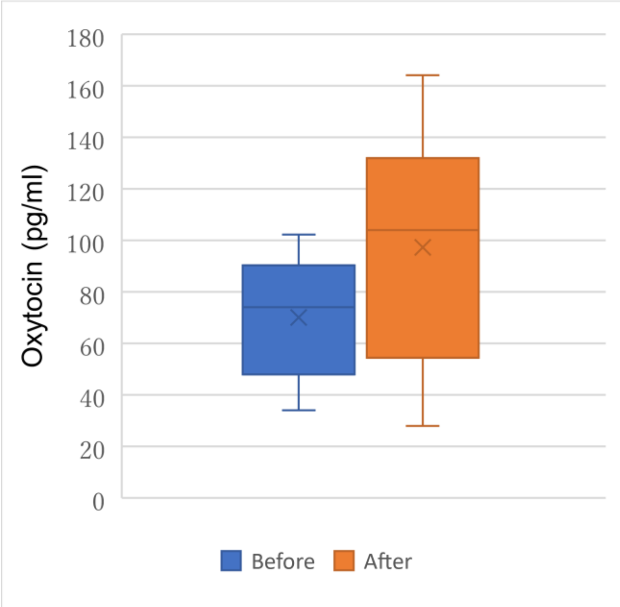

Figure 2. Whisker-plot graph of salivary OT before and after MOZART GST (n=10)

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