

Music-Induced analgesia

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Introduction

It is well known that listening to music can make people calm and relax. More and more evidences are suggesting that music can also have pain relieve effect.

Early scientific report from Gardner in 1960 showed that in 1000 dental patients who had music during their dental procedure, one quarter of them did not require additional analgesia.

This article is going to review some of the evidences and mechanisms for music-induced analgesia, as well as the areas that are yet to be explored.

Current Evidences and Mechanism

Music-induced analgesia has been demonstrated in a recent meta-analysis. Patients who are listening to music experience significantly lower pain intensity than patients who are receiving standard care alone. But it is likely that the capacity of analgesia is variable as there are high degree of inconsistency between the studies.

Advantages of music therapy are clear: Safe, non-invasive and low-cost environmental adjustment, comparing to pharmacological treatment with risk of adverse events.

Another systemic review in 2017 investigated Randomized Controlled Trials regarding to music intervention for chronic pain. They found out that music could reduce self-reported chronic pain, anxiety and depressive symptoms.

Several observations were noted about how best to deliver the music intervention:

- Self-chosen music has a significantly higher analgesic effect than researcher-chosen music, which can be related to feeling of familiarity and control
- No significant difference is observed between listening to music (passive) versus performing music (active). More studies are needed.
- Musical genre is probably not important for the analgesic effect

Regarding to the mechanism of music-induced analgesia, the framework suggested by Tracey and Mantyh may give us some clues (Fig 1). It is a framework describing factors including cognition, emotion and neurobiology that can affect the pain perception.

Distraction is one of the most discussed factors for music induced analgesia. Music can act as a competitor for the stimulus to divert patient's attention.

Music also has the power to induce strong emotions and pleasure for the listener. Valence, liking, and arousal are the emotional measures that have been linked with the pain-modulatory capacity of music. Anxiety is shown to be reduced when listening to music which can affect the pain experience.

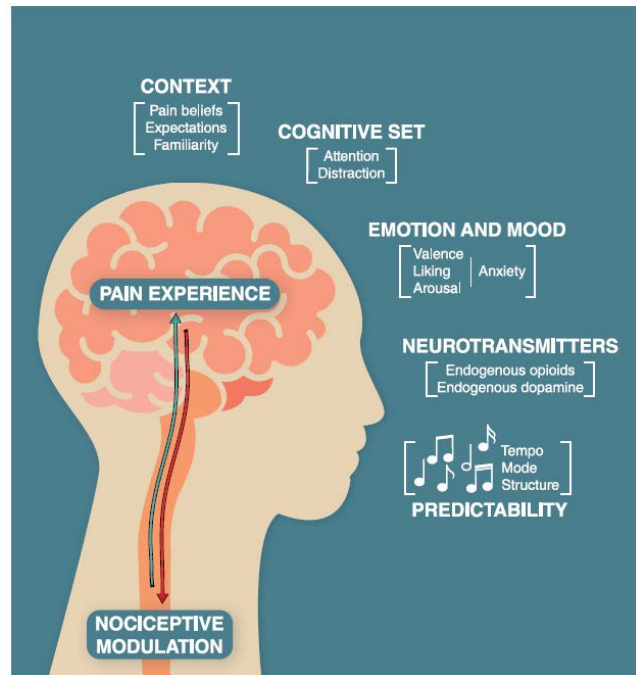


Figure 1

Studies have shown that listening to pleasurable music can induce changes in neural activity among healthy subjects. Limbic system and areas involving in the descending pain-modulatory system have differences in activity when participants are listening to their favorite music compared with no music during painful stimulation, as shown by functional magnetic resonance imaging. Dopamine release is promoted in striatum when participants are listening to pleasurable music.

Future Development

Variability can be observed when using different types of music as intervention. Some studies use classic music, others use Spanish guitar or new-age synthesizer, which give different conclusions regarding to the analgesic effect. Meanwhile, a meta-analysis suggests the effect is not related to the specific type of music. Further studies are needed to clarify the possible effects of different types of music.

Another observation from the studies is that music chosen by patient has been shown to have a greater analgesic effect than music that is chosen by the researcher. The effect is attributed to personal preference and familiarity, which in turn may increase the activity in limbic, paralimbic and reward structures of the brain.

However, when we are doing tasks that are preferred and familiar, can we still have the analgesic effect as in the case of listening to music? In other words, more investigations are needed for the uniqueness of music in analgesia.

Summary

“Where words fail, music speaks.” Apart from consultations, medications and procedures, music can be a great adjuvant for pain relief. It is safe, convenient and universal. Growing evidences are suggesting a role for music-induced analgesia. Studies have shown that the best way to deliver the therapy is letting patient choose their own music. Hopefully, we can help our patient to relieve their suffering with their favorite music.

Reference:

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