MUSIC: A NEW INTERGRATED MODEL IN PHYSIOTHERAPY

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ABSTRACT: *Thirty subjects with spinal pain at a private practice were randomly selected and interviewed. A shortform McGill Pain Questionnaire was used to measure pain intensity before and after treatment. The experimental group received physiotherapy and slow tempo music, while the control group received only physiotherapy. The study demonstrates the important role of psychology in the treatment of pain and the valuable use of music as part of physiotherapy.*

KEYWORDS: PHYSIOTHERAPY, PAIN, MUSIC, PSYCHOLOGY

INTRODUCTION

Pain is one of the most challenging problems in physiotherapy. It is a challenge to those who seek means to help the patient, and it is a challenge to the patient who is trying to find someone to relieve his or her unpleasant symptoms.

The International Association for the Study of Pain (1968) defined pain as an unpleasant sensory and emotional experience associated with actual or potential tissue damage. It is a personal experience and is composed of both physical and psychological factors. According to Melzack, Weisz and Sprague (1963) the pain experience consists of three major psychological dimensions; sensory-discriminative, motivational-affective and cognitive-evaluative. The gate control mechanism has been proposed to explain the process of pain modulation and is still the most satisfactory theory of the pain mechanism. Pain can be modulated at various levels of the neuraxis including the peripheral, dorsal horn and brain stem. The psychological approaches to modulate pain will take place in the corticolimbic area, by cognitive strategies, behaviour modification and psychotherapy. All these levels are neurophysiologically and neurochemically interrelated. A psychological approach should be a major consideration in the treatment of a painful condition. (Adams, 1997). The gate control theory also provides a conceptual framework for the multiple influences on the transmission (T) cells in the central nervous system (Melzack, Loeser, 1978). Multiple interactions determine the nature of the pattern which is generated by the transmission of cells. In this way it is plausible to postulate that patients receiving physiotherapy would benefit from introducing another sensory input.

Pain reduction is reported by Rider (1985) in a procedure involving music and muscle relaxation. Wolfe (1978) reported that music played during pain rehabilitation sessions appeared to improve the patient's level of physical activity and verbal expression. Studies by Hanser and O'Connell (1983) indicated that mothers in labour emitted fewer pain responses in the presence of a specially designed music program. Good (1995) indicated that the anxiety levels of post-operative patients were significantly lower if music, positive thinking, and relaxation were combined. The relationship between music and medicine has been recognised and in this rapidly developing field has many different components. During the late part of this century, the International Society for Music in Medicine was established and the connection and interplay between the mind, body and social environment of the patient was identified.

Music affects all three psychological dimensions of pain. The motivational-affective dimension, has the potential to change unpleasant emotional aspects like fear and depression. The sensory evaluation component of pain is to re-conceptualize the painful experience. The patient can dissociate him or herself from the pain by concentrating on the music. Largo tempo music, which is of a slow tempo, 60 beats per second, has been successfully used by Meiring (1986) to improve the attention span of hyperactive children. The purpose of this study was to attempt to show that the addition of music to physiotherapy will enhance and support the psychological dimension of pain and that two therapies used simultaneously will be more beneficial than one.

METHOD

Thirty subjects (8 men and 22 women) with spinal pain were randomly selected to participate in this study. Each subject was interviewed and the purpose of the study was explained to them prior to commencement of physiotherapy. A consent form was signed indicating their willingness to participate in the study. The average age was 49 years. Children under twelve were excluded. Random selection was used to allocate the subjects to the experimental and control group. The McGill (short form) Pain Questionnaire - MPQ (Melzack, 1987) was completed before and after treatment on day one and four. Subjects with an initial pain intensity lower than 8, were excluded as well as those who took analgesics before treatment. Those with hearing disorders, signs of senility or a second pathology that could contribute to pain were also excluded. The experimental group was exposed to recorded largo-tempo music while receiving physiotherapy, while the control group only received physiotherapy. Subjects were evaluated and treated by the same physiotherapist on a daily basis, while a second physiotherapist assisted with the MPQ.

MATERIALS

Pain is not a simple sensory modality, but a complex multi-dimensional experience. The McGill Questionnaire which was developed by Melzack and Torgenson (1971) consists of descriptive, motivational - emotional and evaluative dimensions of pain. At the same time it provides a basis for the evaluation of pain. It has been successfully used by Schorr (1993). The MPQ takes about 5 to 10 minutes to complete, which is time consuming in a busy practice. Therefore it was decided to use the short-form MPQ which was developed for use in specific research settings where the period available to obtain information from patients is limited. Reading, Everitt and Sledmere (1982) established the validity and reliability, r = 0,86, which indicates its evaluative potential.

The experimental group was exposed to a recorded version of slow tempo music, average 60 beats per minute in a

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4/4 time, which is largo tempo music. The same music was used every time. Some of the music that was used, was Bach, JS - Concerto No. 4 in G minor BWV, 2nd movement (largo); Chopin, FF Sonata No. 3 in B minor op 58 (largo); Vivaldi, A - Concert in F major RV 286 (largo); and Dvorak, A - Symphony No. 9, New World (largo).

Certain physiotherapeutic modalities like TENS; acupuncture and interferential therapy may have an immediate analgesic effect on pain and were therefore excluded from the treatment regime. Techniques of choice were mobilization according to the Maitland technique, ultrasound, massage and traction. The treatment was aimed at reducing the subject's pain.

RESULTS

Thirty patients were admitted into this study and 15 allocated to either the control or the experimental group.

On admission there were no statistical differences between the two groups. After the treatment on day one the experimental group had significantly less pain than the control group ($p=0.002$). On day four a significant difference was again observed after treatment ($p=0.032$)

In this study a p value of <0.05 was considered to be significant.

The results indicated that music had an immediate effect on pain intensity.

DISCUSSION

The paper describes an evaluative study investigating the effect of music during physiotherapy of a group of patients who experienced spinal pain. The experimental group showed significantly lower pain intensity after the treatment on both days of testing. In contrast the control group also showed a lower pain intensity after treatment, although this was not significant. Physiotherapy modalities do relieve pain, but with the addition of music a more effective form of treatment took place. Many studies of music in pain management have shown an increase in pain tolerance and threshold (Storr, 1997). In this study, the first where music and physiotherapy were combined for pain relief, music appeared to have an enhancing effect when integrated with other methods of treatment. This strengthens the concept that therapeutic procedures in combination are often more effective than the mere additive effects of each. Music as seen in the literature elicits psychological and cognitive responses and causes relaxation (Maslar, 1986). Physiotherapy is mainly a physical treatment, which influences the modulation of pain at the dorsal horn and peripheral levels (ultrasound, manual therapy and manipulation). Acupuncture and TENS are modulated at the brain stem level, but they were not used in this research. The addition of music brought forth a corticolimbic modulation and at the same time a fulfilment of the psychological needs of the subjects. As psychological approaches can be used to reduce pain, it also follows that psychological factors may enhance and maintain pain. Pain has an emotional and sensory component, it is thus important during physiotherapy to take psychological factors into consideration and to pay attention to the past experience, culture and social background of patients. The emotional component of pain is important and cannot be ignored. Pain is a highly personal experience, which patients often find difficult to talk about, but by listening to specific music, a form of catharsis can take place because of the personal involvement with music. The use of specific prescriptive music to rehabilitate psychological and physiological dysfunction has several advantages.

In the political climate of south Africa, injuries and pain are often associated with poor relationships, degrading of human value and fear. The emotional component of pain is normally obvious and music can help not only to reduce fear but also aggressive feelings. It will be advisable on further research to re-test subjects after 10 days of termination of treatment.

Music should play an important component in medical education, students should have the opportunity to experience music of various levels of intervention to assist them in self knowledge. This will lead to a dramatic revolution for subjects with pain and it will also help physiotherapists entering into the interdisciplinary venture as they expand their investigation of music and psychology and physiotherapy. It should lead to a more interdisciplinary research conducted on an international level.

CONCLUSION

In this study music appears to help overcome emotional problems during physiotherapy of painful spinal conditions. The combination of music therapy and physiotherapy appears to be more effective for pain inhibition than physiotherapy alone.

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