

Practice Trends of Therapeutic Ultrasound Used In Musculoskeletal Physical Therapy in Karachi

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Abstract— The purpose of this study is to check the practicing trends of therapeutic ultrasound used in Musculoskeletal Physical therapy in Karachi. It was a cross sectional study. The setting of study was physical therapy departments and clinics of Karachi. The duration of this study was 6 months from January 2013 to June 2013. A questionnaire based on study conducted in Brazil by Brito Vieira in 2011 was used to collect data. A face to face interview was conducted with the participants to get the questionnaires filled. The questions in the questionnaire, were regarding the practicing trends of the therapeutic ultrasound. The data collected was analyzed using SPSS version 14 and Descriptive statistics of different variables were calculated. Our data revealed that most of the physical therapists of Karachi's hospitals and clinics use the therapeutic ultrasound. Mostly continuous mode and 1MHz was used. Ultrasound is the widely used modality and is being used for treating different disorders related to different body parts.

KEY WORDS: Therapeutic Ultrasound, Musculoskeletal Physical Therapy, Electrotherapy.

1 INTRODUCTION

Therapeutic ultrasound has been used by physical therapists since more than 50 years. It has become a widely used therapeutic modality in the field of physical therapy^[1]. Therapeutic Ultrasound has continuous and pulsed modes. Continuous has thermal effects^{[2], [3]}. It is best absorbed in tendon, ligaments, fascia, Joint capsule and scar tissue. It is used in chronic conditions^[4]. Pulsed has no heating effects. It improves the tissue repair and is used in acute conditions. It produces micro massage action, best absorbed in Muscles, area of edema^{[3], [5]}. Tissues having more protein have the capability to absorb more energy as compared to tissue having fat or water. Keeping this thing in mind one would select 3MHz for treating skin and 1MHz for treating deep muscular injury^[6]. Heating effects can raise the temperature which helps to decrease pain, increase tissue extensibility, improve blood circulation, mild inflammatory response, reduce joint stiffness, and reduce muscle spasm. Non heating effects cause cavitations and acoustic micro streaming^[7].

Therapeutic ultrasound is frequently used method for many of the musculoskeletal problems. In orthopaedic practice the physical therapist used the therapeutic ultrasound in following conditions: To lessen inflammation, to amplify tissue extensibility, to help tissue remodeling, to help in soft tissue healing, to reduce pain and to reduce edema. It also helps to transmit medication for swelling, inflammation and pain^[8].

It is known that mainly T.U.S. effects are divided into thermal & non-thermal effects. But these effects cannot be totally separable as they occur simultaneously^[9]. Therapeutic Ultrasound is frequently used at shoulder, elbow, knee & ankle regions. The main treatment

The aim to conduct this study was to check the current practicing trends of therapeutic ultrasound among the physical therapists working in musculoskeletal disorders.

2 MATERIAL & METHODOLOGY

It was a cross sectional study. The duration was 6 months from January 2013 to June 2013. The data was collected from different physical therapy department and clinics of Karachi. The sample size was 150 physical therapists. Selection of sample was on convenient sampling. Both males and females having at least 1 year of experience were included. A questionnaire was based on a study conducted in Brazil by Brito Vieira in 2011. An interview of each participant was conducted to get the questionnaire filled. The questions in the questionnaire, were regarding the practicing trends of the therapeutic ultrasound. The data collected was analysed using SPSS version 14 and descriptive statistics of different variables were calculated.

3 RESULT

The response rate of this study was 100%. Out of 150 participants 142 were using the modality. 65% were females and 35% were males. 52% participants had experience of 1-5 years, 28.7% had 5.1-10years experience, 12 % of subjects had experience of 10.1-15 years, and 7.3 % participants had more than fifteen years of experience. Results showed that 95% participants used T.U.S.

Table 1: Parameters of Therapeutic Ultrasound used.

	No. of responses	percentage
Mode		
Continuous	56	37.3
Pulsed	49	32.7
Both	37	24.7
Frequency		
1MHz	51	34

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goals for applying T. U.S. were pain & swelling reduction^{[10], [11]}.

3MHz	48	32
Both	43	28.7

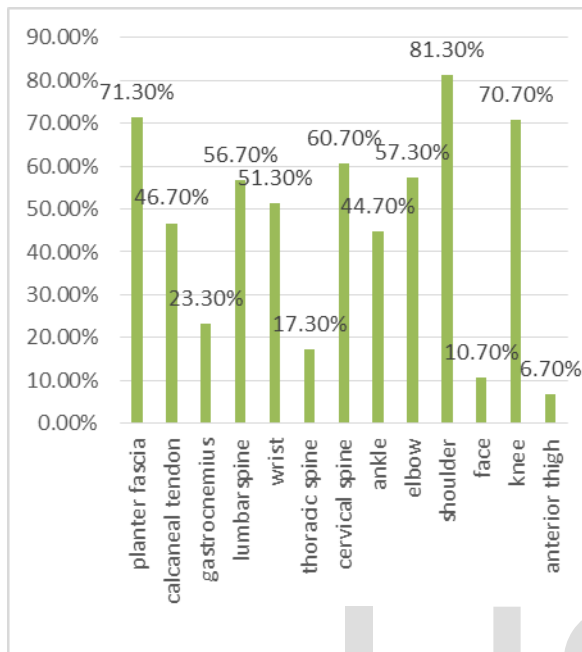


Figure 1: The use of T. U. S. on different body parts.

4 DISCUSSION

In physical therapy the “Therapeutic Ultrasound” is the widely used therapeutic modality [12], [2], [13], [14], [5], [11], [15], [16], [1]. Ultrasound is thought to be a very important modality in the field of physical therapy for musculoskeletal ailments. It is used for soft tissue inflammation, tissue extensibility, scar tissue remodeling, pain management, tissue healing, soft tissue healing [11], Phonophoresis [17], fracture healing [18], and to improve active range of motion [19]. The therapeutic ultrasound is used on different areas of body for these purposes; these areas include shoulder, elbow, knee, ankle, cervical spine, calcaneal tendon, planter fascia, lumbar spine thoracic spin, anterior thigh, gastrocnemius, and face [1].

The therapeutic ultrasound is mostly used for muscles and tendons and when areas of body are concerned shoulder, elbow & knee are mostly treated with ultrasound [10].

Musculoskeletal physiotherapists use ultrasound most frequently on following body parts were included: Planter fascia, calcaneal tendon, Gastrocnemius, Lumbar Spine, wrist, Thoracic Spine, Cervical Spine, Ankle, Elbow, Shoulder, Face, Knee and Anterior Thigh. Studies have shown that ultrasound is widely used by the physical therapists for the treatment of shoulder problems [10], [11], [1]. The studies on its effectiveness have mixed findings e.g. ultrasound being beneficial for calcific tendinitis & not for non-specific complaints of shoulder [20], several studies have proven it to be ineffective [12], [14]. Physical therapists also use it for planter fascia and Zonon et al proved that it is ineffective [21]. Mascasin et al proved it is effective [22].

Draper in his study had proved its effectiveness for regaining normal range of motion of wrist after injury or surgery but this study had a very few number of participants [19]. The use of therapeutic ultrasound is controversial in treating Carpal tunnel Syndrome [23]. After reading so many studies proving ultrasound to be ineffective one would think when it is ineffective then why is it used so widely by almost all of the physical therapist dealing in musculoskeletal ailments? This is because the researchers have used different parameters for different conditions; there is a need to seek out an appropriate parameters guideline to achieve the desired effect. If the ultrasound parameters are used correctly, one would get the positive results [24]. Despite of all these evidences in favour of therapeutic ultrasound being ineffective the most evident fact is that still therapeutic ultrasound is so widely. The therapeutic ultrasound is also used on biological tissues like, Skin, Bone, Menisci, Articular Capsule, Bursa, Tendon, ligament and Muscles. The tissues which have high protein absorb ultrasound energy more rapidly than those with high level of fat or water content [6]. The therapeutic ultrasound is particularly used for tendons, ligaments and bursa [2]. The results of this study show that most of physical therapists use it for muscles. This result corresponds with BritoVieira et al study [1].

5 CONCLUSION & RECOMMENDATION

This study revealed that ultrasound is widely used electrotherapeutic modality in the field of physical therapy. There is wide range of differences in using different parameters of this modality. Some physical therapists have thorough knowledge of different effects these different parameters have and others use the preset parameters for each and every patient without judging or investigating their needs and requirements of their condition. Despite of lack of evidence of T. U. S.’ effectiveness it is widely used and it is a common belief that it produces improvement in the condition but this is controversial as other modalities and medications are also used along with therapeutic ultrasound. Although evidences are lacking to prove T. U. S.’ effectiveness it is being used widely on wide range of body parts.

The sample size of this study was small and only Karachi’s hospitals and clinics were included so we would recommend that same survey should be done at Pakistan level with large sample size. We would also recommend the use of guidelines for using T. U. S. which are present in the electrotherapy text books so that the damage that can be caused by malpractice could be minimized.

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