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Statnews

The Newsletter of The Society of Teachers of the Alexander Technique

Alexander Technique and Postural Tone

Research shows Alexander Technique changes postural behaviour

A paper entitled Increased dynamic regulation of postural tone through Alexander Technique training has been published in Elsevier's journal *Human Movement Science*. It is the first modern study into how the Alexander Technique works to be published in a reputable journal. Yhe main author was Dr Tim Cacciatore, who completed his teacher training at Victoria Training Course for the Alexander technique last year. He is also a researcher at the Institute of Neurology, University College London.

The research was driven by Tim's interest in how the Technique affects patterns of muscular tension in the body and was part-funded by the Alexander Trust.

The study found that the Alexander Technique changes a fundamental aspect of motor/postural behavior: how muscular anti-gravity support is regulated. This helps establish that the Technique changes behavior, rather than just having clinical effects, like helping back pain. We can now say that scientific findings indicate the Alexander Technique changes how anti-gravity muscle tension is regulated, and that reduces stiffness along the spine and in the hips.

Read the summary of the paper:

Increased dynamic regulation of postural tone through Alexander technique training

Summary of research published in Human Movement Science
Korina Biggs ad Tim Cacciatore

Introduction

This piece of research was driven by an interest in stydying how the Alexander Technique affects patterns of muscular tension in the body. The brain must regulate muscle tension in order to support the body against gravity. This type of long-lasting muscle activity is technically called postural tone, and is particularly important along the body axis to keep the spine from collapsing. Because it seems so basic, it is easy to suppose that postural tone is well studied and scientifically understood. Surprisingly, it is not.
This is primarily because postural tone is difficult to measure. Its slight magnitude, ongoing nature, and broad distribuiton across the musculature make it difficult to quantify.
In contrast, balance (how we keep our body mass above our feet), a very different phenomenon, is well studied and well understood. This is because the frequent forward and back movements that occur with balance are easy to measure, in contrast to the sustained forces that oppose gravity, which are not.

'Twister'

Several years ago, Dr Cacciatore worked in collaboration with Victor Gurfinkel in Portland Oregon to help devise a method for measuring postural tone, referred to as 'Twister'. It is a machine which measures and analyses the force required to very slowly twist the neck, trunk or hips as a person stands upright. (See picture on front page.)

Standing upright requires muscular activity to counteract gravitational forces, and twisting stretches these muscles so that the resistance we measure to twisting reflects the forces (i.e. tension) in these muscles to oppose gravity. Leaning against a support reduces the amount of muscular activity needed and would affect the measurement. Thus Twister is built in a way that twists you, but you can't lean on it, so that the resistance measured reflects a subject's unaided muscular opposition to gravity. This is achieved by Gurfinkel's clever arrangement of hinges and springs.

To ensure the measurement of resistance reflects muscular forces, the twist is small. This is so as to exclude forces from ligaments, which only begin to tighten at around 30 degrees of twisting. So keeping the twist well beloww that angle gives a measurement of postural tone.
Twister can be configured to measure tone in the neck, trunk or hips. Measurement reflect the total integrated activity of all muscles within each region, as opposed to that of a particular muscle.

To date this method has led to six publications that help to shed light on how postural tone is controlled, but this is the first one to involve the Alexander Technique. The subjects of the other papers included Parkinson's disease, and how tactile information affects postural tone.

The first Twister study (Garfinkel et al. 2006) revealed that postural tone differs substantially among individuals.
Stiff people are much stiffer (3-4 times) than less stiff people. These differences in postural tone could be caused by two factors: the amount of muscle tension, or how this tension adapts dynamically to changes in posture or load.
In other words, low stiffness could result from a person having low tension or by changing this dynamically during twisting – by 'letting go' (reducing activity) of those muscles lengthened by twisting and 'taking up slack' (increasing activity) of those shortened. *[Editor's note: Compare the discussion of twisting in Raymond Dart's paper,* The Attainment of Poise *in* Skill and Poise, *STAT Books 1996.]* This first Twister study found that the major difference between subjects was that stiff people tended to have fixed muscle activity, while those who were less stiff adapted tone dynamically.

The objective in the present study was to investigate the effects of the Alexander Technique on postural tone.
While it is clear from subjective experience that such patterns change, it is not clear precisely how. The amount of tension, its distribution throughout the body, and its dynamic adaptability are likely all changed by lessons, in complex interrelated ways. This study began to examine these issues. From a scientific standpoint, the question of general importance was wether a person can make their tone more dynamically responsive through some kind of training.

Methods
This study consisted of two parts. First, the postural tone of Alexander teachers was compared with that of control subjects. Second, the postural tone of people with low back pain was examined over time – before and after Alexander lessons. These two approaches yield complementary information.

Postural tone was measured with Twister in the neck, trunk and hip. Each of these requires separate trials, with body attachments in appropriate places so that the respective region is rotated. In all cases, several ten degree rotations in each direction were used, which takes three minutes as rotation is very slow. In essence, a trial feels similar to having a teacher with very free hands turn your head, shoulders or pelvis very slowly. The device feels unusual because it is extremely stiff towards rotation (required to measure resistance) but extremely compliant for all other motions (so as not to provide postural support).

Study using Alexander teachers
Fourteen pain-free teachers and fifteen pain-free control subjects were recruited to match in age, weight, height, and gender. It was found that the Alexander teachers had much lower resistance to twisting than control subjects.

The average stiffness of Alexander teachers was roughly half that of the controls for all regions (i.e. neck, trunk, and hipps). As described above, the lower stiffness in Alexander teachers could be due to having less tension or more adaptive tension. Three different methods were used to assess how adaptive their tone was: the variability of resistance, the shift in neutral position (also called phase advance), and electrical measurements of muscle activity. In general, adaptive tone is more variable, has a larger shift in neutral position, and muscle activity that changes with twisting.

This study found that all three measures were greater in Alexander teachers than in the controls, indicating that their postural tone was more adaptive. A correlational analysis supported that this increased dynamic adaption did indeed contribute to lower stiffness.

Study using the back pain subjects

Eight subjects with low back pain were used. All subjects were tested over a baseline period, after a placebo-control intervention, and after Alexander lessons. The interventions were both given two sessions per week for ten weeks. Intervention order was also randomised.

It was found that the back pain subjects decreased hip and trunk stiffness significantly (by 29%) following Alexander training but not the control intervention. Neck stiffness was not measured. Before lessons, back pain subjects had more variation in stiffness: some were very stiff while others had extremely low stiffness. The subjects with the highest stiffness had the biggest decrease from the Alexander Technique. There were not enough back pain subjects to determine wheteher their postural tone became more dynamic, however.

Conclusion

This study represents a first step towards understanding the Alexander Technique and postural tone. More research is needed to understand how the amount of muscle tension and its distribution throughout the musculature change with the Technique, in addition to its adaptability. Future studies will examine these issues as well as how postural tone relates to movement co-ordination and pain.

References

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