'Neurocognitive and somatic components of temperature increases during g-tummo meditation: Legend and reality' by Maria Kozhevnikov, James Elliott, Jennifer Shephard & Klaus Gramann PLoS ONE

Maria Kozhevnikov (Psychology) has demonstrated, for the first time, that it is possible for core body temperature to be controlled by the brain.

A team of researchers led by A/P Maria Kozhevnikov found that elevated core body temperature increases can be achieved using certain meditation techniques (g-tummo) which could help in boosting immunity to fight infectious diseases or immunodeficiency. Previous studies conducted by Herbert Benson on g-tummo meditators showed only increases in peripheral body temperature. The study documented reliable core body temperature increases for the first time in Tibetan monks and nuns practising g-tummo meditation.

The g-tummo meditative practice controls “inner energy” and is considered by Tibetan practitioners as one of the most sacred spiritual practices in the region. Monasteries maintaining g-tummo traditions are very rare and are mostly located in the remote areas of eastern Tibet. Maria Kozhevnikov observed the unique ceremony in a remote monastery in Tibet, where nuns were able to raise core body temperature and dry up wet sheets wrapped around their bodies in the cold Himalayan weather (-25 degrees Celsius) while meditating. In the region where the ceremony is held she conducted a study with Tibetan monks and nuns performing g-tummo practice while their core body temperature electroencephalographic (EEG) activity were measured. The team observed increases in core body temperature up to 38.3 degree Celsius. This core body temperature increases correlated significantly with increases in alpha brain activity as measured by EEG recording as well as apnea duration during the specific breathing technique.

A second study was conducted with Western participants who used only a breathing component of g-tummo practice and also were able to increase their core body temperature, within limits. The findings from the study show that specific aspects of meditation techniques can be used by non-meditators to regulate their body temperature through the breathing component of g-tummo meditation. The techniques could potentially allow practitioners to adapt to and function in cold environments, improve resistance to infections, boost cognitive performance by speeding up response time and reduce performance problems associated with decreased body temperature. The two aspects of g-tummo meditation that lead to temperature increases are "vase breath" and concentrative visualisation. "Vase breath" is a specific breathing technique which causes thermogenesis, which is a process of heat production. The other technique, concentrative visualisation, involves focusing on a mental imagery of

flames along the spinal cord in order to prevent heat losses. Both techniques work in conjunction leading to elevated temperatures up to the moderate fever zone. Assoc Prof Kozhevnikov explained, “Practicing vase breathing alone is a safe technique to regulate core body temperature in a normal range. The participants whom I taught this technique to were able to elevate their body temperature, within limits, and reported feeling more energised and focused. With further research, non-Tibetan meditators could use vase breathing to improve their health and regulate cognitive performance.”

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