

Neck cooling improves elite sporting performance by tricking brains of athletes, research reveals

July 6 2017

With Wimbledon underway again for another year, University of Hertfordshire research has revealed that cooling the neck of top sportspeople can improve performance, by lowering thermal sensation and tricking their brains into perceiving less fatigue.

The study, which was published in the journal *Sports*, aimed to examine the effect of neck [cooling](#) on national standard table tennis performance - in particular on shot accuracy – however researchers also believe that findings are relevant to other similar skill-based sports, such as tennis.

Performance scores of national table tennis players were significantly greater after neck cooling had taken place, compared with when it hadn't, with a 15% improvement of shots on target observed.

University of Hertfordshire researchers Dr Lindsay Bottoms and Terun Desai believe that this is because the human brain alters exercise intensity with increasing fatigue, allowing exercise to continue, albeit at a slower pace. This has negative implications for skill-based sports such as tennis and table tennis, which require high intensity for peak performance.

The new findings demonstrate that neck cooling could elicit peak performance by reducing this perception of physical exertion, meaning that this is a psychological rather than physiological effect.

Enhanced performance after neck cooling

During the study, eight national level male table tennis players were recruited and attended four testing sessions separated by a week. Session one determined fitness levels, and session two was a familiarisation trial. The final two sessions involved completing table tennis-specific exercises either with or without neck cooling for 1 min before each exercise period (bout: 80–90 shots), which represented an individual game.

Performance was measured by the number of balls hitting two pre-determined targets. Heart rate, ratings of perceived exertion, and thermal sensation were measured.

Overall total performance scores (shots on target) were significantly greater after neck cooling, with a 15% improvement.

Cooling tricks the brain

The researchers, from the University of Hertfordshire, said: "Our research demonstrates how an athlete's brain anticipates fatigue and alters exercise intensity to avoid reaching exhaustion, allowing the athlete to continue exercising at a lower intensity.

"Therefore, cooling the neck during intervals could improve table tennis performance by effectively tricking the brain into thinking that the body is less fatigued than it really is.

"We believe that these findings also apply to tennis, which is a similar [high intensity](#), skill-based sport with intervals. In fact cooling may have a greater impact in tennis because not only will it make the player feel psychologically better, but also physically reduce core temperature, as

[tennis](#) requires greater [physical exertion](#) and players are likely to become hotter.

"Particularly playing in the tournament such as Wimbledon during hot weather, [neck](#) cooling - for example with a cold wet towel - has potential to significantly impact [performance](#) and shot accuracy."

More information: Terun Desai et al. Neck Cooling Improves Table Tennis Performance amongst Young National Level Players, *Sports* (2017). [DOI: 10.3390/sports5010019](#)

Provided by University of Hertfordshire

Citation: Neck cooling improves elite sporting performance by tricking brains of athletes, research reveals (2017, July 6) retrieved 9 April 2024 from <https://medicalxpress.com/news/2017-07-neck-cooling-elite-sporting-brains.html>

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