

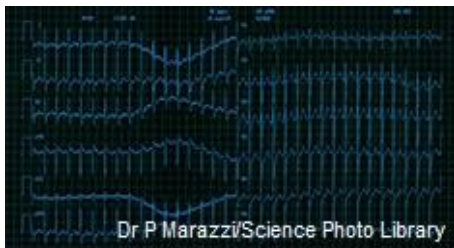


Modified Valsalva manoeuvre for supraventricular tachycardia

A UK randomised controlled trial found that using a modified version of the Valsalva manoeuvre, where the patient was laid flat and raised their legs immediately after the move, was more effective than the standard manoeuvre at restoring normal heart rate in people who presented to emergency departments with an abnormally fast heart rate.

Overview:

- A UK randomised controlled trial assessed approaches to the Valsalva manoeuvre, a technique that involves exhaling forcefully against a closed airway (for example, by keeping the mouth closed and pinching the nose while trying to breathe out).
- Using a modified version of the Valsalva manoeuvre, where the patient was laid flat and raised their legs immediately after the move, was more effective than the standard manoeuvre at restoring normal heart rate in people who presented to emergency departments with supraventricular tachycardia.
- UK emergency departments should consider using the modified Valsalva manoeuvre as an effective, safe and easy-to-administer way to treat supraventricular tachycardia.



Background: Supraventricular tachycardia is a type of heart arrhythmia characterised by an abnormally fast heart rate of over 100 beats a minute ([NHS Choices 2015](#)).

Episodes of supraventricular tachycardia can sometimes be stopped using techniques that stimulate the vagus nerve. One example is the Valsalva manoeuvre, which involves exhaling forcefully against a closed airway; for example, by

keeping the mouth closed and pinching the nose while trying to breathe out.

The Valsalva manoeuvre has been shown to restore normal heart rate in between 5% and 20% of people with supraventricular tachycardia ([Appelboam et al. 2015](#)).

Current advice: Guidance on [peri-arrest arrhythmias](#) from the Resuscitation Council (UK; [NICE accredited](#)) recommends that people with stable regular narrow-complex tachycardia should initially be treated with vagal manoeuvres, such as the Valsalva manoeuvre. A multilead electrocardiogram should be used during each manoeuvre.

In people with unstable regular narrow-complex tachycardia with adverse features caused by the arrhythmia (such as transient loss of consciousness), synchronised electrical cardioversion should be attempted. Vagal manoeuvres should be applied or adenosine administered, or both, while preparations are being made urgently for synchronised cardioversion.

The NICE Clinical Knowledge Summary on [palpitations](#) likewise recommends the Valsalva manoeuvre – for example, asking the person to blow into a syringe for 15 seconds while lying down (face up) – to stop an episode in people with persistent supraventricular tachycardia.

New evidence: [Appelboam et al. \(2015\)](#) undertook a randomised controlled trial to assess whether a modified version of the Valsalva manoeuvre was more effective than the standard Valsalva manoeuvre at restoring normal heart rate in people with supraventricular tachycardia (the REVERT trial).

People with suspected supraventricular tachycardia were recruited from the emergency departments of 10 hospitals in south west England.

Half of the participants were randomly assigned to the standard Valsalva manoeuvre (control group; n=216), which entailed lying semi-recumbent and performing the strain by forced expiration for 15 seconds. Participants assigned to the modified Valsalva manoeuvre (intervention group; n=217) likewise performed the same strain in a semi-recumbent position. This was immediately followed by lying flat and having their legs raised by a member of staff to 45° for 15 seconds. Participants were then returned to the semi-recumbent position for a further 45 seconds.

More people in the modified Valsalva manoeuvre group (43%) than people in the standard manoeuvre group (17%) achieved normal sinus rhythm at 1 minute after the manoeuvre. People in the modified Valsalva manoeuvre group were significantly more likely to achieve sinus rhythm than those in the standard manoeuvre group (odds ratio [OR]=3.7, 95% CI 2.3 to 5.8, p<0.0001).

People in the modified Valsalva manoeuvre group were less likely to need any further emergency treatment for supraventricular tachycardia (including adenosine) than those in the standard Valsalva manoeuvre group (OR=0.33, 95% CI 0.21 to 0.51, p<0.0001). The authors calculated that 3 people needed to undergo the modified Valsalva manoeuvre to avoid 1 case of further treatment.

Strengths of this study include that it recruited people presenting to English emergency departments, so is likely to be highly generalisable to other UK hospitals. In addition, the treating clinicians were existing treating staff who had been trained in the modified manoeuvre. Limitations include that treating doctors could not be masked to participants' treatment allocation.

Commentary by Professor Alasdair Gray, Professor of Emergency Medicine and Director of Emergency Medicine Research Group, Royal Infirmary of Edinburgh and University of Edinburgh:

“Patients with supraventricular tachycardia often present to UK emergency departments. Current guidelines (for example, from the [Resuscitation Council \[UK\]](#) and the [European Society of Cardiology](#)) recommend vagal manoeuvres, including Valsalva techniques, as first-line management for supraventricular tachycardia.

“The standard Valsalva technique has a 5–20% success of reverting supraventricular tachycardia to sinus rhythm. This low success rate means that many patients require adenosine, a short acting atrioventricular blocking agent. Although successful for most, adenosine requires intravenous cannulation and its use results in highly unpleasant although transient side effects.

“The REVERT trial compared a modified Valsalva manoeuvre with the standard Valsalva technique as first-line management for adults with supraventricular tachycardia presenting to UK emergency departments. The results of this robustly designed pragmatic trial are impressive. A total of 43% of people randomised to the modified technique reverted to sinus rhythm, compared with 17% in the standard Valsalva group. This is equivalent to an absolute risk reduction of 26

percentage points and a number needed to treat of 3. More than two thirds (69%) of people in the standard Valsalva arm required intravenous adenosine, compared with half (50%) of people in the modified Valsalva arm. There were no significant complications of the new technique.

“This trial will change practice in the acute management of supraventricular tachycardia. The modified Valsalva manoeuvre is safe, easy to administer after a simple education programme and cost neutral. It has the additional benefit of being simple to teach to patients and straightforward to deliver by prehospital care personnel, reducing the duration of symptoms and potentially preventing the patient’s need to come to hospital.”

Study sponsorship: National Institute for Health Research.

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