SVT: Valsalva Manoeuvre, Modified

Summery

Modified Valsalva manoeuvre with passive leg elevation and supine positioning at the end of the strain. The Valsalva manoeuvre increases vagal tone, slows conduction through the atrioventricular (AV) node and prolongs the AV nodal refractory period, leading to a reduction in heart rate and reversion of supraventricular tachycardia.

Indication & Benefits

Patients with SVT.
Triggers that may predispose to episodes of SVT include medications (e.g. asthma inhalers, cold remedies), drinking large amounts of caffeine or alcohol, stress or emotional upset, and smoking.

Contraindication and Adverse Effects

Contraindications

Valsalva manoeuvres are contraindicated in patients with SVT associated with:

- acute myocardial infarction
- haemodynamic instability (eg systolic blood pressure <90 mmHg)
- aortic stenosis
- carotid artery stenosis
- glaucoma or retinopathy.

Precautions

Acute myocardial infarction should be considered and excluded, especially in ‘at risk’ patients experiencing their first episode of SVT.

Adverse effects

Interventions that increase vagal tone can result in adverse events, including sinus pauses, AV block and syncope.

Practical Description

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The patient is placed in a semi-recumbent position and instructed to exhale forcefully (strain) into a manometer to generate a pressure of 40 mmHg for 15 seconds. This is followed by supine repositioning and passive leg raising to 45 degrees for 15 seconds. The patient is then returned to the semi-recumbent position for a further 45 seconds before re-assessment of cardiac rhythm. (Also see Training.)

Where a manometer is not available, a 10-mL syringe blown to just move the plunger generates a similar pressure.

Blood pressure, electrocardiogram (ECG) and heart rate should be monitored during the manoeuvre. The expected response has four phases:

- **Phase one**– a transient increase in aortic pressure and a compensatory decrease in heart rate, due to increased intrathoracic pressure generated during forced exhalation against resistance.
- **Phase two**– the end of the transient period, with a decrease in aortic pressure as a consequence of reduced venous return and hence cardiac output, with baroreceptor response leading to increased heart rate.
- **Phase three**– the end of the strain phase of the Valsalva manoeuvre, with further decrease in aortic pressure and compensatory rise in heart rate.
- **Phase four**– increased venous return accentuated by raising legs leading to increasing aortic pressure and compensatory decrease in heart rate, with subsequent return to resting heart rate.

Training

- Video demonstrating the modified Valsalva manoeuvre for the emergency treatment of the supraventricular tachycardia (under 'supplementary video)(Article Here)
- Image of modified Valsalva manoeuvre
- Short video demonstrating the modified Valsalva manoeuvre for the emergency treatment of supraventricular tachycardias (SVT)

Availability

The modified Valsalva can be performed in any location, as long as the patient can safely undertake a Valsalva strain and be repositioned (see Description). Patients with or at risk of recurrent SVT can be taught how to perform the technique for themselves.

Resources

Consumer resources

- Patient.info provides information about supraventricular tachycardia.

Evidence

NHMRC Level II evidence.

References

1. Appelboam A, Reuben A, Mann C, et al. Postural modification to the standard Valsalva manoeuvre for emergency treatment of supraventricular tachycardias (REVERT): A randomised controlled trial. Lancet 2015;386(10005):1747–53.
2. Collins NA, Higgins GL. Reconsidering the effectiveness and safety of carotid sinus massage as a therapeutic intervention in patients with supraventricular tachycardia. Am J Emerg Med 2015;33:807–9.
3. Smith G. Management of supraventricular tachycardia using the Valsalva manoeuvre: A historical review and summary of the published evidence. Eur J Emerg Med 2012;19(6);346–52.