

Syncope during spirometry – Protocol

Background

The reflex syncope's are because of a sudden failure of the autonomic nervous system to maintain adequate vascular tone during orthostatic stress, resulting in hypotension with bradycardia resulting in cerebral hypoperfusion and loss of consciousness. Reflex syncope is

- (1) neurocardiogenic (vasovagal) syncope and
- (2) carotid sinus syndrome.

It presents with a prodromal phase (nausea, light-headedness, visual changes or diaphoresis (sweating)) followed by a sudden loss of consciousness.

Recovery is generally rapid and uneventful. The reasons for neurocardiogenic syncope are unclear.

Forceful and repeated blowing while performing spirometry breathing exercises can cause sudden decrease in venous return to the heart and precipitated vasovagal syncope. (1)

Subjects on new hypertensive drugs may have dizzy spells or syncope from the forced manoeuvres of spirometry. Where suspicion of severe hypertension is high, blood pressure should be measured prior to testing.

Severe hypertension is considered a contraindication to spirometry (systolic >200 mm Hg, diastolic >120 mm Hg). (2)

How to recognise syncope

The following are signs that syncope is about to occur

- Colour drains from the face
- Patient appears to convulse slightly; this will then lead to patient losing consciousness and becoming flaccid. Patient will come around and may not be aware of “what just happened.”

Measures to take in the event of syncope

- Spirometry should always be performed in a chair without wheels and with arms to ensure the safety of the patient in the event of syncope
- During spirometry the assessor should always keep an eye on the subject, especially if a history of syncope is noted on the file
- Should signs of syncope arise (see above) the manoeuvre should be stopped, this will most likely lead to a reduced forced vital capacity (FVC). However, a slow vital capacity (SVC) can be performed to give a more accurate measure of VC.
- A relaxed manoeuvre could also be attempted where the subject exhales forcibly for the first 3 seconds and then instructed to relax the exhalation for the remainder of the manoeuvre. This is called the modified expiration technique (3)
- Subsequent blows can be attempted if subject is closely monitored. Give at least a one-minute rest between subsequent manoeuvres.
- Document on the subject's test result:
 - *“Syncope occurred during spirometry, FVC may be underestimated”* or
 - *“Syncope occurred during spirometry; VC taken from an SVC manoeuvre”*

- Ensure to please a not on subjects file, so that futures assessors are aware that the subject may experience syncope upon testing.

Abstract from the ATS recommendations from the Standardisation of spirometry (4)

It is particularly helpful to observe the subject with occasional glances to check for distress, and to observe the tracing or computer display during the test to help ensure maximal effort. If the patient feels “dizzy”, the manoeuvre should be stopped, since syncope could follow due to prolonged interruption of venous return to the thorax. This is more likely to occur in older subjects and those with airflow limitation. Performing a vital capacity (VC) manoeuvre (see VC and IC manoeuvre section), instead of obtaining FVC, may help to avoid syncope in some subjects. Reducing the effort partway through the manoeuvre [13] may give a higher expiratory volume in some subjects, but then is no longer a maximally forced expiration

References

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