

Supplementary file

Title: The accuracy of postoperative, noninvasive Air-Test to diagnose atelectasis in healthy patients after surgery – a prospective, diagnostic pilot study.

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Methods

Procedures

We performed a pilot study in ten healthy and non-smoker volunteers in the Hospital Privado de Comunidad, Mar de Plata (Argentina) to establish the mean time from Venturi mask removal with oxygen supplementation to the stabilization of the expiratory fraction of Oxygen (FEO₂) signal. The volunteers were breathing spontaneously through a Venturi mask at 4 L/min with a jet adjusted to a theoretical FiO₂ of 0.5 during 10 min before the Air-Test was performed. Nasal oxygen and carbon dioxide concentrations were measured using a 1 mm ID cannula placed 1 cm inside the right nostril and connected to the side-stream capnograph S5 (GE Healthcare/Datex-Ohmeda, Helsinki, Finland). Time-base oximetry and capnography were recorded with the Datex Collect software (GE Healthcare/Datex-Ohmeda, Helsinki, Finland) and analyzed off-line. We measured mean time needed from mask removal to the stabilization of the FEO₂.

The FAST SpO₂ algorithm derives SpO₂ using the absorption of red and infrared light. But unlike the traditional algorithm, the FAST algorithm examines the strength of the different frequency components that make up the signals. This approach allows to distinguish the physiological signal from the noise artifacts increasing measurement accuracy¹. Nevertheless, the SpO₂ measurement was considered qualitatively optimal only when a plethysmography waveform stable and normal was seen during the average time period of 10 seconds given by the monitor. The conventional finger probe pulse oximetry is an accurate reflection of SaO₂ values measured by the reference standard (CO-oximeter) with a bias of 2% and with a standard deviation (precision) of less than 3%².

Results

Demographic data of the 10 volunteers are described in the were age: 31 (7) years old, weight 71 (9) kg and height: 173 (4) cm. The mean time for the stabilization of the expired O₂ fraction once supplementary oxygen therapy was removed was 56 (7) seconds.

References

1. Baker SJ, "Motion Resistant" pulse oximetry: A comparison of new and old models. *Anesth Analg* 2002; 95: 967-72.
2. Jubran A. Pulse oximetry. *Crit Care* 2015; 19:272.