Assessment of noninvasive acoustic respiration rate monitoring in patients admitted to an Emergency Department for drug or alcoholic poisoning.

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To compare respiration rate measurement by an acoustic method and thoracic impedance to capnometry as the reference method, in patients at the Emergency Department after drug or alcoholic poisoning. In this observational study, 30 patients aged 18 or older, hospitalized at the Emergency Department for drug or alcoholic poisoning, without any contraindication to a face mask and/or a cervical acoustic sensor, were included in the study. They benefited from a simultaneous recording of their respiration rate by the acoustic method (RRa(®), Masimo Corp., Irvine, CA, USA), by thoracic impedance (Philips Intellivue(®) MP2, Suresnes, France) and by capnometry (Capnostream(®) 20, Oridion, Jerusalem, Israël) through a face mask (Capnomask(®), Mediplus Ltd, Raleigh, NC, USA) for 40-60 min. Of the 86,578 triplets collected, 77,155 (89.1%) were exploitable. Median (range) respiration rate measured by capnometry was 18 (7-29) bpm. Compared to capnometry, bias and limits of agreement were 0.1 ± 3.8 bpm for the acoustic method and 0.3 ± 5.5 bpm for thoracic impedance. The proportions of RR values collected by acoustic method or by thoracic impedance which differed over 10 or 20% during more than 15 s, compared to capnometry, were 8.3 versus 14.3, and 1.5 versus 3.8%, respectively ($p < 0.0001$). The acoustic sensor had to be repositioned on three patients. For 11 patients, the Capnomask(®) was removed several times. In patients with drug or alcoholic poisoning, the acoustic method seems more accurate than thoracic impedance and better tolerated than face mask capnometry.