

Comparison of acoustic and impedance methods with mask capnometry to assess respiration rate in obese patients recovering from general anaesthesia.

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Respiratory depression, a potentially serious complication after general anaesthesia, can be detected promptly by close monitoring of both oxygen saturation and respiratory rate. Obese patients have morphological changes that may impair the reliability of monitoring devices. In this study, respiration rate was simultaneously recorded every second for up to 60 min using a computer in 30 adult obese patients (body mass index $\geq 35 \text{ kg.m}^{-2}$), by three methods: acoustic; thoracic impedance; and capnometry via a facemask (Capnomask, reference method). Of the 99,771 data triplets collected, only 85,520 (86%) were included; 12,021 (84%) were not studied due to failure of capnometry and 2240 (16%) due to failure of the acoustic method. Compared with capnometry, bias was similar using both the acoustic method and impedance (-0.3 bpm vs. -0.6 bpm, respectively, $p = 0.09$), but limits of agreement were narrower for the acoustic method (± 3.5 bpm vs. ± 5.3 bpm, respectively, $p = 0.0008$). The proportion of respiration rate values obtained with the acoustic method and impedance that differed by at least 10% or 20% for more than 15 s were 11% vs. 23% and 2% vs. 6%, respectively ($p = 0.0009$ for both comparisons). The acoustic sensor was well tolerated, while the facemask was pulled off on several occasions by four (13%) agitated patients. In obese patients requiring close monitoring of respiration rate, the acoustic method may be more precise than thoracic impedance and better tolerated than capnometry with a facemask.