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Title: Comparison between maximal inspiratory pressures measured by unidirectional valve method and conventional method in healthy subjects without artificial airway

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Body: The most used method to evaluate maximal inspiratory pressure (MIP) is by maintaining maximum negative pressure forced against an occluded airway (MIPsta). To eliminate the need for collaboration, a new technique was developed using a unidirectional expiratory valve (MIPuni) in patients undergoing invasive mechanical ventilation. The aim of this study was to compare these two methods of measurement in patients with spontaneous breathing without artificial airway. We also tested the intra- and inter-observer reproducibility of MIPuni. The study had a crossover design and twelve healthy volunteers performed the evaluation of MIP of each method in a randomized order. A digital manometer was attached to a mouthpiece (MIPsta) or facemask (MIPuni) and the maximal value in each method was considered. The MIPuni was evaluated by two independent observers (A and B), at two different times (1st and 2nd tests) with an interval of at least one week. MIPuni displayed significantly larger values than MIPsta (106.1±29.3 and 98.4±25.8, respectively; p=0.01). The MIPuni obtained by observer A was not different from that obtained by observer B for both the 1st test (105.9±30.4 and 104.3±26.1, respectively; p=0.32) and the 2nd test (105.5±30.1 and 102.6±31.7, respectively; p=0.24). The MIPuni obtained in the 1st and 2nd tests was not different for both observer A (105.9±30.4 and 105.5±30.1, respectively; p=0.13) and observer B (104.3±26.1 and 102.6±31.7, respectively; p=0.21). MIPuni is the better method for measuring MIP in individuals without artificial airway. The inter- and intra-observer measurements were similar.