Factors influencing albuterol aerosol delivery during continuous positive airway pressure: an in vitro study

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THURSDAY MAY 28
Discussion h 14.00 - 15.30

P1 **Posizionamento della punta distale delle derivazioni ventricolo-atriali con tecnica ecografica-elettrocardiografica**
G. Capozzoli, F. Baldinelli, L. Fabbro, R. Pedrazzoli, V. Pirillo, A. Ria, A. Zandonai, F. Auricchio, A. Schwarz

P2 **Newborn resuscitation (NR): l'importanza di un modello organizzativo in un centro nascita di I Livello**
M.A. Scolari, D. Cristadoro, C. Quaresima, L. De Luca, A. Ndongko

P3 **Effects of Positive End-Expiratory Pressure on the homogeneity of ventilation/perfusion matching**
N. Eronia, T. Mauri, C. Turrini, G. Bellani; G. Grasselli, R. Marcolin, A. Pesenti

P4 **Variability of Pmusc/EAdi Index during a weaning CPAP trial as index of neuromechanical efficiency**
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P5 **Pattern of inspiratory muscles activation during a weaning trial**
V.L. Sala, G. Bellani, M. Pozzi, S. Arrigoni Marocco, G. Villa, S. Stropeni, A. Pesenti

P6 **Energy delivered to the respiratory system and ventilator-induced lung injury**
A. Cammaroto, M. Gotti, C. Chiurazzi, I. Algieri, M. Amini, M. Brioni, D. Massari, C. Montaruli, K. Nikolla, M. Guanziroli, M. Cressoni, L. Gattinoni

P7 **Factors influencing albuterol aerosol delivery during continuous positive airway pressure: an in vitro study**
L. Ball, Y. Sutherasan, A. Insorsi, V. Caratto, E. Arditi, E. Sanguineti, M. Marsili, D. D'Antini, P. Raimondo, M. Ferretti, P. Pelosi

P8 **Spontaneous breathing pattern variability is better restored by Neurally Adjusted Ventilatory Assist (NAVA) than by Pressure Support Ventilation (PSV)**
S. Spadaro, R. Di Mussi, L. Mirabella, G. Bortone, C.A. Volta, M. Dambrosio, G. Cinnella, T. Stripoli, A. Civita, F. Bruno, S. Grasso

P9 **Improving the safety of LMA-assisted tracheostomy**
G. Michelagnoli, L. Zamidei, D. Bettocchi, G. Consales

P10 **Optimizing depth of sedation: our experience with dexmedetomidine**
A. Roasio, A. Bresciani, M.T. Novelli, S. Cardellino

P11 **Analisi retrospettiva della mortalità nei pazienti anziani in terapia intensiva**
S. Biondini, M. Barbagallo, S. Di Gennaro, E. Manferdini, G. Fanelli, F. Tagliaferri

Language: Italian or English, according to the Speaker's preference. No simultaneous translation.
Lingua: Italiano o Inglese, a scelta dello Speaker. Non è fornita traduzione simultanea.

FACTORS INFLUENCING ALBUTEROL AEROSOL DELIVERY DURING CONTINUOUS POSITIVE AIRWAY PRESSURE: AN IN VITRO STUDY

L. Ball°, Y. Sutherasan[*], A. Insorsi[**], V. Caratto[†,#], E. Arditi[**], E. Sanguineti[†,#], M. Marsili°, D. D'Antini°[,§], P. Raimondo°[,§], M. Ferretti[†], P. Pelosi°

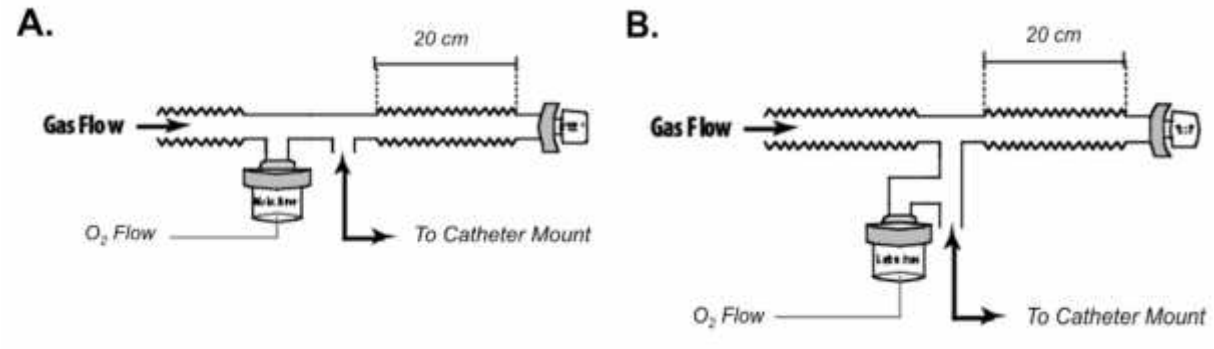
°Dipartimento di Scienze Chirurgiche e Diagnostiche Integrate, Università degli Studi di Genova; [*]Ramathibodi Hospital, Mahidol University, Bangkok, Thailand; [**]U.O. Anestesia e Terapia Intensiva, IRCCS Azienda Ospedaliera Universitaria San Martino IST, Genova; [§]Dipartimento di Anestesia, Rianimazione e Terapia Intensiva, Università degli Studi di Foggia; [†] Dipartimento di Chimica e Chimica Industriale, Università degli Studi di Genova, [#]Dipartimento di Scienze della Terra, Ambiente e Vita, Università degli Studi di Genova.

Introduction: Nebulized bronchodilators are frequently administered to spontaneously breathing patients with continuous positive airway pressure (CPAP), to relief dyspnea and bronchoconstriction. The fraction of the dose of drug actually delivered was shown to depend on many factors in previous studies.

Aim of the study: To investigate the effects of different respiratory nebulizer positions, gas flow and CPAP level during continuous high flow CPAP systems based on Venturi effect**.**

Methods: A pneumatic lung simulator was connected to two different circuits for aerosol delivery: configuration A with nebulizer placed proximal and B distal to the catheter mount. CPAP was generated through a high flow system tested at 30, 60 and 90 L/m supplementary flow and 5, 10, 15 cmH_2O level of CPAP. Albuterol was collected with a filter, and the percent amount delivered was measured by infrared spectrophotometry.

Results: The highest albuterol delivery (13.8 ± 4.4 %) was obtained with the nebulizer placed proximal to the lung simulator (configuration A), independent of flow ($p<0.001$). Increasing CPAP from 5 to 15 cmH_2O increased the aerosol delivery ($p=0.02$). Increasing gas flow decreased albuterol delivery in configuration A ($p<0.001$) but not in configuration B ($p=0.37$).



Conclusion: Based on our in-vitro study, during CPAP delivery with high-flow generator, in order to maximize drug delivery to the airways, the nebulizer should be placed proximal to the patient and lower pressure levels should be avoided.