

EDITORIAL

Pneumological research in Clinics

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CLINICS covers all medical areas. This editorial highlights the field of pulmonary research. We have selected papers published from 2010-11 concerning the Continuously Variable Rating concept, which we have recently put forward as an alternative and hopefully superior method of evaluating published scientific papers (1).

DIAGNOSTIC

Anciaes et al. (2) induced experimental emphysema in BALB/c mice and found that morphometric parameters were more reliable for detecting its presence than the functional parameters measured with respiratory mechanics. Bosch et al. (3) report that a quick diagnosis unit currently being used in a Spanish public university hospital represents a useful and cost-saving model for diagnosing patients with potentially severe diseases. Boskabady et al. (4) report that carpentry work in the city of Mashhad (northeast Iran) was associated with a high frequency of respiratory symptoms, particularly after occupational exposure to irritating chemicals. Costa et al. (5) report that the pediatric risk of mortality score showed adequate discriminatory capacity and thus constitutes a useful tool for assessing the prognosis of pediatric patients who have been admitted to tertiary pediatric intensive care units. Faria et al. (6) report on using a forced oscillation technique to investigate the mechanical properties of the respiratory system to detect early smoking-induced respiratory involvement when pathological changes are still potentially reversible; their findings support the use of this technique as a versatile clinical diagnostic tool for preventing, diagnosing and treating chronic obstructive lung. Guimaraes et al. (7) report that a CT-guided percutaneous fine needle aspiration biopsy of lung lesions had a lower complication rate in their study, but the lesions that lacked pleural contact had more complications. Pimenta et al. (8) propose the desaturation distance ratio, a new composite index that uses continuous peripheral oxygen saturation (SpO₂) instead of a walked distance (a six minute walk test), as a more reliable tool for performing a functional evaluation of interstitial lung disease. Rocha et al. (9) report that the differences between renal function and the tubular handling of potassium and phosphorus are present during the first week of life in preterm neonates who will develop

bronchopulmonary dysplasia. Higher rates of patent ductus arteriosus and indomethacin enhance these differences. Schachner et al. (10) find that at reoperative levels >502 ng/ml, the N-terminal fragment of pro-brain type natriuretic peptide predicts mid-term mortality after isolated coronary artery bypass grafting and is associated with significantly higher hospital mortality and perioperative complications. By measuring adequate discriminative power and calibration, Vieira et al. (11) developed and validated a predictive score for clinical complications during the intra-hospital transport of infants treated in neonatal units. The authors claim that this predictive score can help identify infants at risk of clinical complications during intra-hospital transports.

ONCOLOGY

Ardengh et al. (12) report that using transesophageal ultrasound-guided fine needle aspiration to investigate mediastinal tumoral lesions is an alternative to surgical procedures in a vast majority of cases. Miziara et al. (13) report that single-photon emission computed tomography/computed tomography with Tc-99m-sestamibi showed very low sensitivity and accuracy for the nodal staging of patients with non-small cell lung cancer, despite its high level of specificity. Parra et al. (14) report a direct link between low amounts of type V collagen and decreased cell apoptosis, which may favor cancer cell growth in the Balb/c mouse lung after chemical carcinogenesis. This result may suggest that the strategies aimed at preventing decreased type V collagen synthesis or local responses to reduced apoptosis may have a greater impact on lung cancer control. Pereira et al. (15) report that even low levels of fine particulate matter (PM_{2.5}) increase the risk of urethane-induced lung tumors in Swiss mice. Sardenberg et al. (16) claim that lung metastasectomy is a safe and potentially curative procedure for patients with treated non-lung primary tumors. A select group of patients can achieve long-term survival after lung resection. Terra et al. (17) report that when performed on an outpatient basis in patients with recurrent malignant pleural effusions and Karnofsky Performance Status scores <70, talc pleurodesis is a safe and efficacious procedure that has a low complication rate and helps avoid hospital admissions. Zhang et al. (18) report that tumor-associated macrophages in lung adenocarcinoma have an M2-polarized subtype and are associated with poor prognoses, perhaps resulting from accelerated lymphangiogenesis and lymph node metastasis.

VENTILATION

Casaroli et al. (19) report that a pneumoperitoneum procedure, both alone and in combination with controlled

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ventilation, did not modify the peritoneal lymphatic bacterial clearance in a rat bacterial peritonitis model. Ferreira et al. (20) note that an elevated lower inflection point and the sigmoidal shape of the pressure-volume curves suggest that respiratory system compliance decreased near the end-expiratory lung volume in idiopathic pulmonary fibrosis patients undergoing general anesthesia and mechanical ventilation. Lopez et al. (21) report that the need for more than two hours of mechanical ventilation predicted bronchopulmonary dysplasia in pre-term infants with a gestational age of >26 weeks. This development could be an early marker for developing bronchopulmonary dysplasia. Nery et al. (22) suggest that daily screening to identify the patients who are able to breathe without support is recommended to reduce the length of mechanical ventilation. These authors also propose noninvasive positive-pressure ventilation as a technique to shorten the time that patients remain on invasive ventilation. They report that this intervention reduced the length of invasive ventilation and total ventilatory support and identify this technique as an independent factor associated with survival. Schifelhain et al. (23) report no differences between the Doppler echocardiographic variables and electrocardiographic and other cardiorespiratory variables during weaning from mechanical ventilation using pressure support ventilation or the T-tube procedure. These authors also report that the cardiac structures were smaller, the isovolumetric relaxation time was longer, and the oxygenation level was greater in successfully weaned patients.

INFECTOLOGY

Arslan et al. (24) report that plasma D-dimer levels, which are directly related to the intra- and extra-vascular coagulation that occurs in acute and chronic lung damage in patients with community-acquired pneumonia, increased even for patients who did not have an accompanying disease that would normally cause such an increase. Capelozzi et al. (25) report a detailed histopathological analysis of the open lung biopsy specimens from five acute respiratory distress syndrome (ARDS) patients with confirmed H1N1 in which viral-like particles were successfully observed (via an ultrastructural examination) in the lung tissue. The bronchioles and epithelium rather than the endothelium are most likely the primary targets of infection. Chung et al. (26) report that after completing tuberculosis treatment, several risk factors predict pulmonary function deterioration and significant respiratory symptoms, and multiple risk factors require pulmonary function tests to monitor functional impairment progression, particularly within the first 18 months after completing treatment. Soeiro et al. (27) report that in autopsies of 4,710 patients with acute respiratory failure, bronchopneumonia and cancer were the two most common diagnoses. The most prevalent pulmonary histopathological pattern was diffuse alveolar damage, which was associated with different inflammatory conditions. Toufen et al. (28) report that despite the marked severity of lung disease at admission, patients with acute respiratory distress syndrome (caused by swine-origin influenza A virus infection) presented with a late but substantial recovery over six months of follow-up.

ALLERGY

Boskabady et al. (29) report the preventive effect of a hydroethanolic extract of *Nigella sativa* on tracheal responsiveness and white blood cell count in the lung lavage fluid of sensitized guinea pigs. Gomieiro et al. (30) report that a respiratory exercise program increased muscle strength and had a positive effect on patient health and quality of life in older asthmatic adults. Therefore, a respiratory training program could be included in the therapeutic approach in older asthmatic adults. Guimaraes et al. (31) report on the pulmonary function and prevalence of atopy in school-aged children who had low birth weights as infants; no significant differences were found in the lung functions of the bronchopulmonary dysplasia patients and patients without bronchopulmonary dysplasia, and no evidence of an association was found between atopy and bronchopulmonary dysplasia.

EXERCISE

Castro et al. (32) compare respiratory responses during progressive cardiopulmonary exercise tests performed on cycle or arm ergometers. Although the exercise type did not influence the breathing frequency, it did influence the time-domain ventilatory variability of young, healthy individuals. Myers et al. (33) find that impaired cardiac output recovery kinetics can identify heart failure patients who have higher disease severity, lower exercise capacity, and inefficient ventilation. Estimating cardiac output in exercise recovery may provide added insight into the cardiovascular status of heart failure patients.

APNEA

Neves et al. (34) evaluate the effects of sildenafil on the autonomic nervous systems of patients with severe obstructive sleep apnea and suggest that in addition to worsening sleep apnea, sildenafil may have immediate cardiac effects. Romano et al. (35) report that flow limitation measurement during wakefulness is a highly sensitive and reliable method for identifying obstructive sleep apnea when the test is positive and that this approach may reliably exclude moderate and severe obstructive sleep apnea when the test is negative.

COPD

Reis et al. (36) report that patients with chronic obstructive pulmonary disease present with impaired sympathetic-vagal balance at rest and that the cardiac autonomic control of heart rate is associated with inspiratory muscle weakness in chronic obstructive pulmonary disease. Silva et al. (37) find that respiratory alterations in severe chronic obstructive pulmonary disease may be identified through increased respiratory system impedance, which is more evident in the expiratory phase. The authors claim that these results confirm the potential of within-breath analysis of respiratory mechanics for assessing respiratory modifications related to chronic obstructive pulmonary disease.

TRAUMA

Dong et al. (38) report that the thoracic trauma crush victims of the Sichuan earthquake exhibited life-threatening conditions, with a high incidence of bony thoracic fractures. Patients' ribs were frequently involved in bilateral and severe fractures, which were accompanied by non-rib fractures, pulmonary parenchymal and pleural injuries. Sincos et al. (39) find that endovascular treatment is a safe method for repairing blunt aortic trauma, with immediate and midterm results that were comparable to the results obtained with operative repair. No stent graft complications were identified during follow-up.

Barbalho-Moulim et al. (40) report that preoperative inspiratory muscle training attenuates the impact of bariatric surgery trauma on respiratory muscle strength but does not alter the lung volumes or diaphragmatic excursions of obese women undergoing open bariatric surgery. Costantini et al. (41) report that combining the hemodynamic and immune benefits of hypertonic saline with the anti-inflammatory effects of pentoxifylline (a phosphodiesterase inhibitor) as a hemorrhagic shock resuscitation strategy reduces lung injury compared with the effects of Ringer's lactate. Dogan et al. (42) report that cigarette smoke caused serious histopathological damage to rat respiratory functions, particularly with concomitant exposure to biomass smoke. Otsuki et al. (43) report that in a porcine model, generic (propylene glycol dissolved) sevoflurane preparations are as safe as the original (water dissolved) sevoflurane in terms of hemodynamic and pulmonary effects. Silva et al. (44) report that when tested in a murine model of mucociliary clearance, mycophenolate sodium (a commonly used immunosuppressive drug in lung transplantation) had no effect on transportability properties but significantly reduced the in situ mucociliary transport velocity.

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