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CERAMIDES PLAY A CRITICAL ROLE IN SPONTANEOUS NEUTROPHIL APOPTOSIS
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Neutrophils (polymorphonuclear leucocytes) are short-lived terminally differentiated blood cells that play a vital role in inflammatory responses. Circulating neutrophils are physiologically cleared from the circulation by spontaneous apoptosis. A negative modulation in this process contributes to the development of inflammation. Ceramides are newly recognized as potential mediators of apoptosis. In various cell types, generation of ceramides at the cell membrane occurs early during apoptotic processes. The aim of this study was to examine whether ceramides may be involved in spontaneous neutrophil apoptosis. Blood neutrophils spontaneously die within 12-14 hours in culture. During culture, by Annexin-V cytometry analysis, 6 forms of ceramides were detected (C14, C16, C18), C20, C24), among which the C16 and C24 forms were the most abundant. The level of C24 and C24 increased progressively from 60 hours of culture. The death is then preceded by an accumulation of two types of ceramides (C16 and C44). DL-FFMP is a specific inhibitor of glucosylceramide synthetase and 1-deoxy-D-manno-1-octulosonic acid (DOCHOA) a specific inhibitor of sphingomyelin synthetase. Both inhibitors detect the putative resistant / sensitive phenotypes. Dexamethasone / Tumor necrosis factor (TF) or Dexamethasone / MAF (100 μM) enhances the apoptotic rate as % of cells XAnnexin-V/FITC positive less then 6 hours of incubation. It suggest that an accumulation of endogenous ceramide enhances the rate of spontaneous neutrophil apoptosis. GM-CSF (125 μM), an inhibitor of neutrophil apoptosis, reduces the apoptotic rate of blood neutrophils by 50% of the cells were Annexin-V/FITC negative after 24 h of culture. Levels of ceramides C16 and C24 were although highly reduced after 30 minutes incubation. This indicates that 50% of spontaneous neutrophil apoptosis occurs by GM-CSF, is preceded by a decrease of ceramide C16 and C24 levels. In conclusion, these results suggest that ceramides, especially C16 and C24, are key regulators of spontaneous neutrophil apoptosis.

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COMPARISON OF PULMONARY DISFUNCTIONS CAUSED BY SENDAI VIRUS IN BALB/c AND DBA/2 MICE
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The present study aimed at detecting different susceptibilities of infected mouse strains (BALB/c and DBA/2) to Sendai virus infection. Double-summer plethysmography was the technique implanted to detect pulmonary mucopolysaccharide (PPS) were monitored daily for 7 days, and lung lesions were examined by histopathology in groups of five mice of each strain at 5, 6 and 7 days after infection. SBSA presented alterations in PPS on the third day of infection, that reached their peak at the fourth and fifth day and slightly decreased in the seventh day, even though remaining always different compared to baseline. Peak time, minute volume, breathing frequency (Fr) and specific airway resistance have all significantly increased by the third day while tidal volume and inspiratory (Tl) and expiratory time have all decreased. In contrast, BALB/c only presented significant changes in Fr, specific minute volume and Tl. Those alterations were only observed at the fourth and fifth day, and returned to normal in the following days. The alteration in PPS appeared sooner than variation in lung weight and were correlated with the observations of lung lesions by histopathology. The data collected suggest that BALB/c and DBA/2 have different susceptibilities against the Sendai virus, with BALB/c more resistant to infection, and that double-summer plethysmography can be a trustful and sensitive technique to evaluate the severity of respiratory diseases.

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ACTIVATION OF CIRCULATING POLYMORPHONUCLEAR NEUTROPHILS DURING EXERCISE-INDUCED MUSCLE DAMAGE

To address the question of whether exercise-induced activation of circulating polymorphonuclear neutrophils (PMNs) could be assessed by plasma myeloperoxidase (MPO) concentration could be related to exercise-induced muscle damage, five moderately active male subjects underwent two isokinetic exercise sessions in the eccentric mode. Each session consisted of 5 stages of 20 maximal contractions at 60°/s angular velocity (the knee extension and flexion muscle groups of both legs with 1 min rest periods between each stage. These exercise sessions were separated by a period of 3 weeks during which the volunteers were submitted to 5 training periods consisting of 5 stages of 10 submaximal contractions at 75 % peak torque of the knee extensor and flexor muscle groups of both legs according to the above exercise protocol. The first isokinetic session was followed by severe muscle pain (delayed onset muscle soreness); DOMS as assessed by visual analogue scale; in previously active muscles and significant increases in blood levels of MPO (P < 0.05), serum creatine kinase (CK) and angiotensin (Mb) (P < 0.001). After the training period, the mean values of DOMS, CK and Mb were significantly decreased compared to pre-training session values, and remained practically unchanged at 30 min, 48 and 72 h recovery after the isokinetic session. Mean plasma MPO concentrations were also significantly lowered compared to pre-training values at the 30 min, 48 and 72 h recovery time points. From these results, we concluded that training lowered exercise-induced muscle damage, which were at least partly involved in the activation of circulating PMNs.

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