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Title: Impairment of pulmonary gas transfer capacity and pulmonary capillary blood volume in Crohn's disease

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Body: Rationale: Pulmonary diffusing capacity for carbon monoxide (DLCO) has been shown to be reduced in the Crohn's disease (CD). There is few data regarding the changes in DLCO with the severity of the disease, particularly in children. The purpose of this study was to assess DLCO and the relative contribution of its two components- the membrane diffusing capacity Dm and the lung capillary blood volume Vc- in children with CD of different severity. Methods: Pulmonary function was investigated in children with CD attending to the Paediatric Hospital of Bordeaux-France. Spirometry, lung volumes and Raw measurements were made using a SensorMedics 6200 plethysmograph. DLCO and its components- the alveolar membrane diffusing capacity Dm and the pulmonary capillary blood volume Vc-, the alveolar volume VA and KCO (DLCO/VA) were measured by the single breath NO/CO transfer method (Hyp’air system, MEDI-SOFT). The severity of CD was evaluated by the Pediatric Crohn’s Disease Activity Index (PCDAI). Results: twenty five children with CD - median age # 14 years [10- 18] at diagnosis- were investigated: 15 with Inactive CD (PCDAI<20), 17 with Active CD (PCDAI>20). None reported respiratory symptoms. DLCO, Dm, KCO, Vc, Vc/VA were significantly decreased in the Active CD group compared to the Inactive CD group ($p<0.05$), while VA and Dm/VA were not significantly different between groups. In the CD children, DLCO, DmCO and Vc appeared to be significantly inversely correlated with PCDAI ($p<0.05$). Conclusion: Pulmonary diffusing capacity is impaired in children with active CD, mainly due to a decreased pulmonary capillary bed. It appears that this impairment is related to the disease severity.