Progetti innovativi per le malattie rare

The utility of bronchoscopy to identify phenotypes of post-COVID-19 interstitial lung disease: clinical, radiological, and pathological correlations.

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Abstract

Introduction

Pulmonary sequelae after Sars-Cov-2 infection, range from limited abnormalities to major interstitial lung diseases (ILD). Bronchoalveolar lavage (BAL) and cryobiopsy findings, integrated with the clinical-radiological scenario, may help both clinicians to correctly manage patients, and researchers to better understand the features and pathogenic mechanisms of post-COVID fibrosis.

Aim

Describe different phenotypes and management of post COVID ILD.

Methods

We conducted a prospective multicenter national (Italian) study: PCOILS study – Post-Covid-Interstitial Lung Syndrome). In two centres, Florence and Forlì, subsequent patients seen at 4-18 months after the acute infection underwent transbronchial lung cryobiopsy and BAL if they showed a significant ILD on follow-up HRCT (progressive and/or symptomatic and/or with pulmonary function impairment).

Results

19 patients were biopsied. Patients' characteristics and HRCT features are summarized in Table 1. As shown in Figure 1 we identified three post-COVID phenotypes: 1) prominent vascular changes; 2) post-COVID fibrosis; 3) persistent Sars-CoV-2 infection.

Phenotype 1 (vascular) was detected in two cases that were biopsied early after acute COVID-19 (4 and 5 months respectively). Their HRCT showed pure GGO, the histology showed emangiomatosis-like features (as shown in Figure 1). The patients were followed up without treatment.

Phenotype 2 (post-COVID fibrosis) was detected in seven patients, all with HRCT NSIP/OP features. Histology showed fibrotic or mixed NSIP, fibrotic OP, fibrotic DAD, and bronchiolar damage possibly correlated with ventilation injury in one case (shown in Figure 1). Patients were variably treated with steroids depending on disease extent and symptoms. In the case with post ventilation injury, that didn't show inflammation on biopsy, CSS were stopped.

Phenotype 3 (persistent COVID). The patient was immunosuppressed (Rituximab for NHL) and the HRCT showed Ground glass opacities that worsened between month 6-12. COVID-19 was detected by BAL (Sars-

CoV-2 positivity and CD8+ lymphocytosis - 53% total lymph, CD4/CD8 0.1) and biopsy showed cellular NSIP. He was treated with Casirivimab e Imdevimab with complete resolution.
The remaining 9 patients were reclassified as known ILDs and treated according to current guidelines.

Conclusions

We identified 3 phenotypes of post covid damage with heterogeneous pictures and leading to different treatment choices

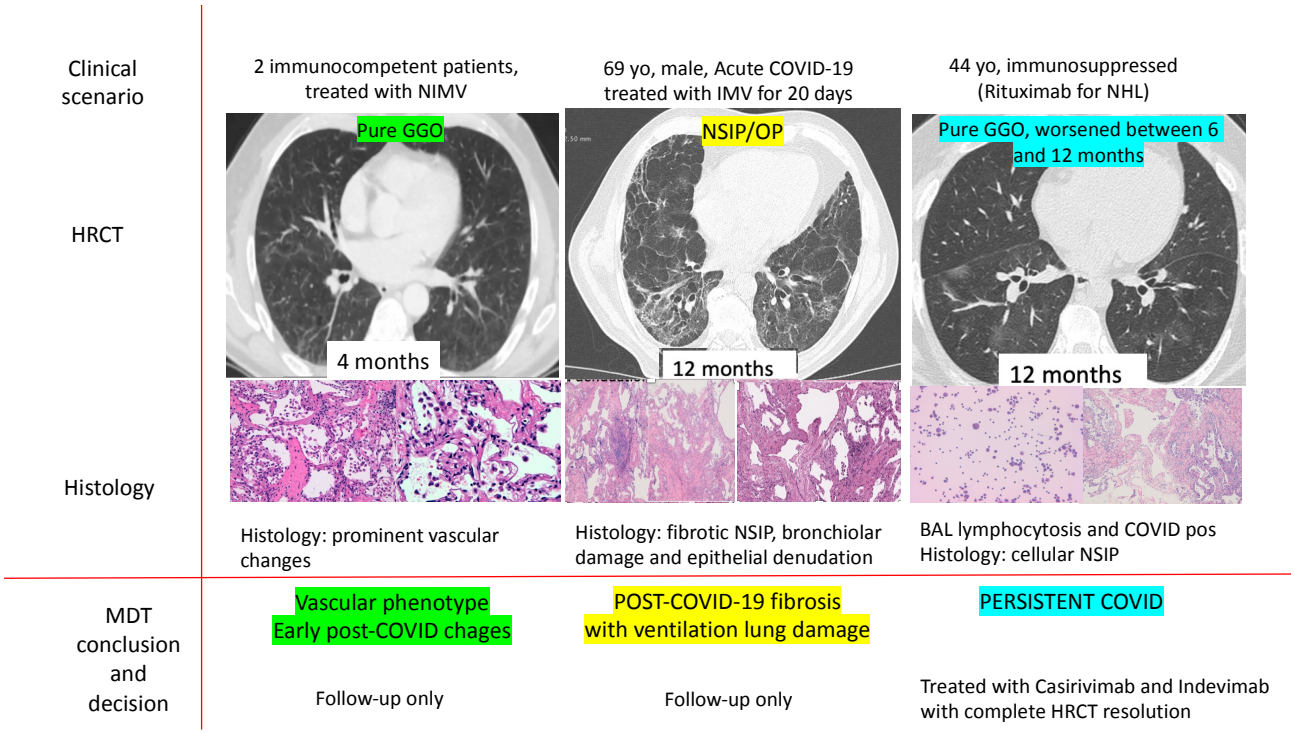

Fig.1

	Total cohort, N=19
Age, median (range)	66 (44-76)
Sex, M/F	18/1
Former/never smokers, n (%)	11 (58%)/8 (42%)
Occupational exposure, n (%)	8 (42%)
Family history for ILD, n (%)	2 (10%)
Bibasal velcro n (%)	9 (53%)
Dyspnea on exertion n (%)	12 (70%)
Immunocompetent n (%)	18/19 (95%)
HRCT extent %, median (range)	40% (10-70)
FVC % median (range)	89 % (53-123)
DLCO median (range)	66% (37-106)
6mwt median (range)	450 m (350-490)

Tab.1