CHARCOT-LEYDEN CRYSTALS IN SPUTUM CYTOLOGY

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Objective:

Eosinophils can release variable sorts of cytotoxic granular proteins, mediators, and growth factors. Charcot-Leyden crystals (CLCs) are Galectin-10 protein crystals. They are bipyramidal hexagonal crystals (~ 100 µm in maximum length) and are a hallmark of eosinophilic inflammation in tissue and body fluid.

To evaluate the number of sputum samples cytology with CLCs in daily routine work and their clinical relevance.

Methods:

We retrospectively collected sputum cytology data from the year 2012-2022. analysed in Division of Pulmonary Cytology, Department of Pathology and Cytology UHC Zagreb. Materials were obtained from the patient immediately on-site or were transported within 2 hours after the patient expelled the sputum into the Petri dish. Particles and/or areas tinged with blood were of interest and were directly smeared onto two glass slides with a disposable inoculation loop and labelled accordingly. After 2 hours of air-dried fixation, slides were stained with May Grünwald Giemsa (MGG) in autostainer. Whenever possible, the microscopic assessment was done by cytotechnologists first and then by cytologists. Cytological sputum samples were separated into two major groups: adequate and inadequate. Sputum samples from the oropharynx, without alveolar macrophages and/or inflammatory cells, were considered inadequate. Samples with macrophages and /or inflammatory cells, and any sputum sample with atypical, suspicious, or malignant cells were considered adequate.

Result:

We evaluated records of 13532 sputum samples through the years, of which 2513 (18,6%) were inadequate. The great majority of adequate samples, 10695/11019 (97,1%) of them were categorized as benign. Out of 11019 (81,4%) adequate sputum samples, 2492 (23,3%) were with eosinophils. We found CLCs in 107/2492 (4,3%) sputum samples with eosinophils. Asthma was the initial diagnosis in 41/107 (38,3%) patients. We did not find an initial diagnosis for 33/107 (30,8%) patients. Of the 41 patients with an initial diagnosis of asthma, 14 (34,1%) had elevated levels of IgE, and 18 (43,9%) had an elevated level of eosinophils in peripheral blood. For 9 (21,9%) and 21 (51,2%) patients, we did not find clinical data on the levels of eosinophils and IgE, respectively.

Conclusion:

Although CLCs' presence in sputum cytology has been known for decades, literature on their development and significance is scant. They are present in a small number of cytology sputum samples with eosinophils, and their presence is, according to literature, often associated with the level of eosinophils in peripheral blood. Prospective studies should be done to evaluate their clinical impact.