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Behavior of nucleated cells in various types of pleural effusion☆

L. Ferreiro[a,b,*], T. Pereiro[a], E. San José[b,c], M.E. Toubes[a], J. Suárez-Antelo[a], J.M. Álvarez Dobaño[a,b], F.J. González Barcala[a,b], N. Rodríguez Núñez[a], A. Lama[a], L. Valdés[a,b]

[a] *Servicios de Neumología, Complejo Hospitalario Universitario de Santiago, Santiago de Compostela, Spain*
[b] *Grupo Interdisciplinar de Investigación en Neumología, Instituto de Investigaciones Sanitarias de Santiago (IDIS), Santiago de Compostela, Spain*
[c] *Servicio de Análisis Clínicos, Complejo Hospitalario Universitario de Santiago de Compostela, Santiago de Compostela, Spain*

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Percentage nucleated cells;
Neutrophilic pleural effusion;
Lymphocytic pleural effusion;
Eosinophilic pleural effusion;
Mesothelial cells

Abstract
Introduction: To know the behavior of cellular components of pleural fluid can help focus the differential diagnosis of a pleural effusion. Our objective was to assess their composition in different types of pleural effusions and assess whether it provides relevant clinical information.
Patients and methods: Observational, cross-sectional and retrospective study in which the cellular components of pleural effusions of different etiology were analyzed. Pleural effusions were classified as neutrophilic, lymphocytic (≥50% of each one of them), eosinophilic (≥10%) or mesothelial (>5%) and were grouped into six diagnostic categories.
Results: 1467 patients were studied (354 heart failure, 59 other transudates, 349 paraneumonic, 133 tuberculous, 397 malignant and 175 other exudates). The predominance cell was lymphocytic in heart failure (44.4%), uncomplicated parapneumonic (29.2%), tuberculosis (88%) and malignant (49.6%); neutrophilic in parapneumonic (57%) and malignant (9.6%); eosinophilic in malignant (6.3%) and mesotelial in tuberculosis (12%). The most frequent etiologies with lymphocyte count ≥80% were tuberculosis (35.1%) and malignant (23.3%). Parameters with higher discriminating accuracy were: leukocytes (transudates: AUC 0.835) and percentage of neutrophils (empyemas: AUC 0.906 and complicated parapneumonic + empyemas: AUC 0.907).
Conclusions: Nucleated cell counts will help focus the etiology of pleural effusions, since each etiology often have a characteristic cell predominance. The percentage of nucleated cells in

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* Corresponding author.
E-mail address: lferfer7@gmail.com (L. Ferreiro).

pleural fluid not ruled out tuberculosis if there is a high count of mesothelial cells, nor a parapneumonic effusion with lymphocytic predominance, or malignancy with ≥80% lymphocytes.

PALABRAS CLAVE
Derrame pleural;
Células nucleadas totales;
Porcentaje células nucleadas;
Derrame pleural neutrofílico;
Derrame pleural linfocítico;
Derrame pleural eosinofílico;
Células mesoteliales

Comportamiento de las células nucleadas en los distintos tipos de derrame pleural

Resumen
Introducción: El conocimiento del comportamiento de los componentes celulares del líquido pleural puede ayudar a enfocar el diagnóstico diferencial de un derrame pleural. El objetivo es evaluar su composición en los distintos tipos de derrames y valorar si proporciona información clínica relevante.
Pacientes y métodos: Estudio observacional, transversal y retrospectivo en el que se analiza el componente celular de derrames pleurales de diversa etiología. Los derrames se clasificaron como neutrofílicos, linfocíticos (≥50% de cada uno de ellos), eosinofílicos (≥10%) o mesoteliales (>5%) y se agruparon en 6 categorías diagnósticas.
Resultados: Se estudiaron 1.467 pacientes (354 insuficiencia cardiaca; 59 otros trasudados; 349 paraneumónicos; 133 tuberculosos; 397 neoplásicos y 175 otros exudados). El predominio celular fue linfocítico en la insuficiencia cardiaca (44,4%), paraneumónicos no complicados (29,2%), tuberculosis (88%) y neoplasias (49,6%); neutrofílico en los paraneumónicos (57%) y neoplásicos (9,6%); eosinofílico en las neoplasias (6,3%) y mesotelial en las tuberculosis (12%). Las etiologías más frecuentes con un recuento linfocitario ≥80% fueron tuberculosis (35,1%) y neoplasias (23,3%). Los parámetros con mayor capacidad discriminante fueron: leucocitos (trasudados: AUC 0,835) y porcentaje de neutrófilos (empiemas: AUC 0,906 y paraneumónicos complicados + empiemas: AUC 0,907).
Conclusiones: Los recuentos de células nucleadas ayudan a enfocar la etiología del derrame pleural, ya que cada etiología suele tener un predominio celular característico. El porcentaje de células nucleadas en el líquido pleural no puede descartar tuberculosis si existe un recuento elevado de células mesoteliales, ni un derrame paraneumónico ante un predominio linfocítico, o malignidad con un recuento de linfocitos ≥80%.

Background

The clinical guidelines for managing pleural effusion (PE) agree on the fact that understanding the cell components of pleural fluid (PF) can help determine its differential diagnosis and indicate which specific examinations are necessary for determining its etiology.[1,2]

Despite the controversy on cellular predominance in certain diseases and its clinical meaning, recent reviews on the contribution of the PF analysis to the diagnosis of PEs are still based on articles published more than 30 years ago, which included a small number of patients.[3–5] Our hypothesis was that the total count and percentage of nucleated cells in PF can help the differential diagnosis of PE. To this end, we assessed their behavior in various types of PEs to understand whether they provided some type of relevant diagnostic clinical information.

Patients and methods

We conducted an observational, cross-sectional retrospective study analyzing the demographic, clinical and analytical characteristics of all adult patients who, between January 2004 and December 2014, underwent a diagnostic thoracentesis at our center due to presenting PE. All data were collected according to the ethical principles of human research, and the study was approved by our hospital's ethics committee (registration 2016/293).

Pleural fluid analysis

The PEs were studied according to our center's standard protocol. The samples for the PF cell counts were collected using DB Vacutainer® vacuum systems with plastic tubes that