Causes of Pulmonary Granulomas: A Retrospective Study of 500 Cases from Seven Countries

Sanjay Mukhopadhyay1, Carol F Farver2, Laszlo T Vaszar3, Owen J Dempsey4, Helmut H Popper5, Haresh Mani6, Vera L Capelozzi7, Junya Fukuoka8, Keith M Kerr9, E Handan Zeren10,11, Venkateswaran K Iyer12, Tomonori Tanaka8, Ivy Narde7, Angheliki Nomikos9, Derya Gumurdulu10, Sudheer Arava12, Dani S Zander6, Henry D Tazelaar13

Author information

1Department of Pathology, State University of New York Upstate Medical University, Syracuse, New York, USA
2Department of Anatomic Pathology, Cleveland Clinic, Cleveland, Ohio, USA
3Department of Pulmonary Medicine, Mayo Clinic, Scottsdale, Arizona, USA
4Department of Respiratory Medicine, Aberdeen Royal Infirmary, Foresterhill, Aberdeen, Scotland, UK
5Department of Pathology, Medical University of Graz, Graz, Austria
6Department of Pathology, Penn State Milton S Hershey Medical Center, Hershey, Pennsylvania, USA
7Department of Pathology, University of São Paulo, São Paulo, Brazil
8Laboratory of Pathology, Toyama University Hospital, Toyama, Japan
9Department of Pathology, Aberdeen Royal Infirmary and Aberdeen University Medical School, Foresterhill, Aberdeen, Scotland, UK
10Department of Pathology, Çukurova University, Adana, Turkey
11Acibadem Health Group, Istanbul, Turkey
12Department of Pathology, All India Institute of Medical Sciences, New Delhi, India
13Department of Laboratory Medicine and Pathology, Mayo Clinic, Scottsdale, Arizona, USA

Correspondence to

Dr Sanjay Mukhopadhyay, Department of Pathology, State University of New York Upstate Medical University, 750 E Adams Street, Syracuse, NY 13210, USA; mukhopas@upstate.edu

Abstract

Background: The frequencies of various causes of pulmonary granulomas in pathological material are unknown, as is the influence of geographical location on aetiology. The aim of this study was to identify
the causes of pulmonary granulomas in pathological specimens, to define their frequencies, and to
determine whether these causes vary by geographical location.

Methods: 500 lung biopsies and resections containing granulomas were reviewed retrospectively by
expert pulmonary pathologists from 10 institutions in seven countries. Fifty consecutive cases from each
location were assigned a diagnosis based on histological features and available clinical/microbiological
data.

Results: A specific cause was identified in 58% of cases (290/500), most commonly sarcoidosis (136,
27%) and mycobacterial or fungal infections (125, 25%). Mycobacteria were identified in 19% of cases
outside the USA versus 8% within the USA. In contrast, fungi accounted for 19% cases in the USA
versus 4% in other locations. Fungi were mostly detected by histology, whereas most mycobacteria were
identified in cultures. In 42% of cases (210/500) an aetiology could not be determined.

Conclusions: Across several geographical settings, sarcoidosis and infections are the most common
causes of pulmonary granulomas diagnosed in pathological specimens. Fungi are more commonly
identified than mycobacteria in the USA, whereas the reverse is true in other countries. A definite
aetiology cannot be demonstrated in more than a third of all cases of pulmonary granulomas, even after
histological examination. These findings highlight the need to submit material for histology as well as
cultures in all cases in which granulomatous disease enters the differential diagnosis.

Source: http://jcp.bmj.com/content/65/1/51.short