

Imported respiratory infections: new challenges and threats

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The term “imported diseases” refers to infectious processes that are acquired in areas where they are more or less common but which are diagnosed and treated in places where they are not found or are extremely rare¹. In clinical practice these diseases appear amongst two very different groups: travelers coming back from underdeveloped countries and immigrants who come from those parts of the world. The difference is an important one as the agents responsible for respiratory diseases tend to be different in each group.

In Spain, the detection of imported diseases has been rare but is becoming more common with the increase in tourism to exotic regions and particularly the rise in immigration.

There are approximately 1 000 000 immigrants from developing countries living in Spain (700 000 legally and 300 000 illegally)². Likewise, between 700 000 and 1 000 000 Spaniards^{3,4} travel to underdeveloped countries where they may be exposed to pathogens. Although imported diseases are rare in individual clinical practices, the growth of both phenomena (immigration and travel) means that in general these diseases will be gradually included in the differential diagnosis of many clinical syndromes.

There are noninfectious agents that are known to affect the lungs more frequently in the tropics⁵ (such as tobacco, rheumatic cardiopathy, pneumoconiosis or illnesses caused by organic dust) and which must not be overlooked. However, the most common imported respiratory diseases are infections and conclusions can be drawn from a basic analysis: *a*) most infections

detected in immigrants and, to a lesser extent, in travelers are caused by the same etiological agents that cause lung disease in the immigrants' countries of origin; *b*) the main imported respiratory problem is tuberculosis, and *c*) some apparently “exotic” infections are already present in Spain, although they are not well known. We will comment briefly on the two last points. Imported tuberculosis occurs mainly amongst immigrants though tuberculous infection is now found increasingly amongst travelers to high endemic countries both during their journeys⁶ and during longer stays⁷. Characteristics of tuberculosis in immigrants, as opposed to tuberculosis in the local Spanish population^{8,9}, can be summarized as follows: *a*) frequency is higher than in the local population (approximately one in ten cases appears in an immigrant); *b*) the disease normally develops two to three years after the immigrant arrives in Spain; *c*) in general the disease is assumed to be an endogenous reactivation rather than an exogenous infection; *d*) extrapulmonary symptoms are more often present than with local forms of the disease; *e*) primary resistance is more common, and *f*) the characteristics of the immigrant population makes compliance with treatment and completion of adequate chemoprophylaxis more difficult.

With regard to “exotic” infections that are present in this country, we will concentrate on three: tularemia, *Hantavirus* infection and strongyloidiasis. Towards the end of the 1990's a serious outbreak of tularemia started in Castilla and Leon and spread to the neighboring autonomous regions¹⁰. Ulceroglandular presentation was the most common but a considerable number of cases had pneumonic symptoms¹¹. With regard to *Hantavirus*, studies of seroprevalence in Soria show that 2.2% of the population has had contact with these microorganisms¹², and case reports have been published¹³. Finally, the high prevalence of *Strongyloides stercoralis* infection on the Mediterranean coast must not be overlooked, as this helminth can cause pulmonary symptoms both during

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primary infection and in immunodepression^{14,15}.

We are going to discuss imported respiratory infections in the following sections. One way of approaching the problem is by using classical business management analysis: the SWOT matrix, for strengths, weaknesses, opportunities and threats. We will start with weaknesses, followed by threats, strengths and finally opportunities.

Weaknesses

The most obvious weakness is the lack of knowledge about many aspects of these diseases so we have outlined some ideas for treating them. First, it is essential to distinguish between acute and subacute or chronic diseases. Acute diseases are characteristic of travelers whereas subacute or chronic diseases are found in immigrants¹⁶. The main acute imported diseases with pulmonary effects are accompanied by fever and can be divided into four main groups: malaria¹⁷, typhoid¹⁸, rickettsiosis¹⁹ and tropical viruses²⁰. Subacute diseases, on the other hand, include tuberculosis, parasite infections and primary mycoses²¹. One disease that clearly shows the dichotomy between acute and chronic symptoms is schistosomiasis^{22,23}. In its acute form, characteristic amongst travelers, the clinical symptoms known as Katayama fever (fever, urticaria, cough and transitory infiltrations) depend on the immune response of the host, whereas in the chronic form found in immigrants, the respiratory manifestations (dyspnea, micronodular patterns and pulmonary hypertension) depend on the embolization of eggs that have not been retained by the hepatic filter. A second aspect of interest is knowledge of the exact geographic distribution of the potential diseases. Thus Chagas' disease, for example, can only be considered in the differential diagnosis of an immigrant coming from America, and Loa loa infection is only found in a certain part of Africa. In the third place, it is important to know the immune status of the patient. This is because of the higher prevalence of human immunodeficiency virus among immigrants, and the possibility, in this context, of the reactivation of latent infections (such as tuberculosis, histoplasmosis or *Penicillium marneffe* infection)²¹. Pulmonary manifestations may also develop when proximal organs are affected and this must be taken into account. Thus, the presence of megaesophagus in a case with Chagas' disease can lead to aspiration pneumonia; restricted myocardopathy associated with filariasis can cause acute cardiogenic pulmonary edema; or the penetration of *Paragonimus* sp. through the diaphragm can cause a large pleural effusion²⁴. Broadening the differential diagnosis is another practical measure that helps the interpretation of imported respiratory diseases. For example, when imported tuberculosis is suspected from

clinical and radiological findings, melioidosis²⁵, primary mycosis²⁶ and paragonimiasis²⁴ should also be considered depending on the country of origin of the patient. When dealing with imported pulmonary infections it is essential to know how and where to carry out specific complementary tests and obtain certain drugs. A correct diagnosis of tropical eosinophilia not only requires confirmation of a prolonged stay in an endemic region and an eosinophil concentration greater than 3000/ μ L but absence of microfilariae must also be demonstrated, antibodies to filariae found, and response to diethylcarbamazine evaluated. Consequently, the microbiologist must have experience in reading a blood smear and carrying out a Knott test (for the detection of microfilaremia)²⁷. However, antibodies to filariae can only be detected in highly specialized centers and diethylcarbamazine is difficult to find (as it is not available through either conventional channels or importers). Finally, in uncertain cases it is better to overtreat than to leave untreated parasitic infections like strongyloidiasis or filariasis because of the subsequent problems they can cause (hyperinfection syndrome or cardiomyopathy, respectively). The low toxicity of antihelminthic drugs makes this decision easier to take.

Threats

Although the possibilities of an outbreak of imported lung disease are theoretically high, in clinical practice both the frequency and the causes of lung infection in immigrant groups are similar to those of the local population²⁸. Furthermore, the biological characteristics (biological cycle, reserves, etc.) of the causal agents of these diseases make it difficult or even impossible for them to be transmitted to the local population, considering present day conditions of hygiene and health care in Spain. For this reason, the biggest threat concerning imported pulmonary diseases, with the exception of tuberculosis, is of them going unrecognized in the groups mentioned above.

Strengths

The health care system in Spain is generally well prepared for the challenge of imported diseases, with respect to both imaging and laboratory techniques and the information sources available. Regarding this last aspect, there are excellent reviews on the subject by authors from Spain²⁹ as well as other countries^{16,30-34}.

Opportunities

The current rate of immigration in Spain (around 2.5%) is well below that of other developed countries, whether in Europe (e.g., approximately 9% in Austria

or Germany) or in other continents (e.g., 17.5% in Canada or 22% in Australia). That means we have time enough to get to know these infections, to gradually incorporate them into the diagnostic differential and to organize adequate treatment.

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