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Eosinophilia prevalence and related factors in travel and immigrants of the network +REDIVI[☆]

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ABSTRACT

Population movements during the last few decades have resulted in a progressively increasing interest in certain infectious diseases. Eosinophilia is a common finding in immigrants and travellers. One of the most common causes of eosinophilia is helminth infection, and some intestinal protozoa.

The aim of this paper is to describe the epidemiological characteristics of cases with eosinophilia and its association with the presence of parasites in the REDIVI data network.

This is a multicentre prospective observational study that includes patients diagnosed with eosinophilia registered in the cooperative network for the study of infectious diseases imported by travellers and immigrants (+REDIVI) from January 2009 to December 2012.

A total of 5255 episodes were registered in the network during the study period, and eosinophilia was observed in 8.1–31.3% of cases (depending on the immigration group). Some 60.2% were male, with a median age of 31.0 years, 72.4% were immigrants and 81.2% were asymptomatic. The most commonly identified parasites were *S. stercoralis* (34.4%), *Schistosoma* sp. (11.0%), and hookworm (8.6%). The relationship between eosinophilia and parasite infection was significant for all helminths (except for cutaneous larva *migrans*). The symptoms and duration of the journey did not significantly determine the presence of eosinophilia.

In the case of eosinophilia in a person who has lived in helminth endemic areas, it is advisable to carry out targeted studies to diagnose the infection, regardless of immigration type, length of stay, or the presence of symptoms.

Prevalencia de la eosinofilia y factores relacionados en los viajeros e inmigrantes de la red +REDIVI

RESUMEN

Palabras clave:
Inmigrantes
Medicina de los viajes
Medicina tropical
Red
Eosinofilia

Algunas enfermedades infecciosas han adquirido más relevancia por el aumento de los movimientos poblacionales. La eosinofilia es un hallazgo frecuente en inmigrantes y en viajeros. Una de las causas más frecuentes de eosinofilia es la infección por helmintos y algunos protozoos intestinales.

El objetivo de este trabajo es describir las características epidemiológicas de los casos con eosinofilia y su asociación con la presencia de parásitos en la red de datos REDIVI.

Se trata de un estudio observacional multicéntrico prospectivo, donde se incluyen los casos diagnosticados de eosinofilia registrados en la Red cooperativa para el estudio de las infecciones importadas por viajeros e inmigrantes (+REDIVI) desde enero de 2009 hasta diciembre de 2012.

Se registraron en la red un total de 5.255 episodios durante el periodo de estudio, y la eosinofilia fue un hallazgo en el 8,1 al 31,3% de los casos (dependiendo del tipo migratorio). Fueron hombres el 60,2%, con una mediana de 31,0 años, inmigrantes el 72,4% y asintomáticos el 81,2%. Los parásitos más frecuentemente identificados fueron *S. stercoralis* (34,4%), *Schistosoma* sp. (11,0%) y uncinarias (8,6%). Existía asociación entre eosinofilia y presencia de parásitos para todos los helmintos (excepto para larva *migrans* cutánea). La sintomatología y la duración del viaje no determinaron significativamente la presencia de eosinofilia. Ante una eosinofilia en una persona que ha vivido en zonas endémicas de helmintiasis es aconsejable realizar estudios dirigidos para su diagnóstico, independientemente del tipo migratorio, la duración de la estancia o la presencia de sintomatología.

Introduction/Objectives

In recent years, certain infectious diseases have gained more relevance because of the increase in population movements. According to data from the National Institute of Statistics of Spain, during the first quarter of 2015, there were 2,758,000 trips abroad by Spaniards, with 46% for tourism, 27% for visiting family members and 23% for work or business.[1] In addition, impoverished financial conditions or war in certain countries lead to a global increase in migratory movements towards more fortunate countries. The Spanish national survey on immigration estimated that in 2013 a total of 5,118,112 people living in Spain (11% of the population) were born abroad.[2]

The eosinophil counts that define eosinophilia can vary from one study to another, but are normally $\geq$450–600 eosinophils/mm^3.[3–5] A high eosinophil count is a common finding in immigrants; from 12% to 27% depending on the publication.[5–8] In travellers, the prevalence of eosinophilia is somewhat lower, ranging from 5% to 9%.[9,10] One of the most common causes of eosinophilia, particularly in the immigrant population, is helminth infection and infection from certain intestinal protozoa (*Dientamoeba fragilis* and *Cystoisospora belli*).[4]

Helminths are parasites which are prevalent throughout the world, but they particularly affect the impoverished areas of the planet, especially in the tropics. The most common are the geohelminths: *Ascaris lumbricoides*, *Trichuris trichiura* and hookworms (*Ancylostoma duodenale* and *Necator americanus*). People infected by these helminths often remain asymptomatic. However, in children, infection can affect growth and cognitive development.[11] Strongyloidiasis is another important helminthiasis that can persist for years in the host because of its capacity for autoinfection and multiplication. Although it does not normally cause symptoms, it can become life-threatening in the case of hyperinfestation in immunosuppressed patients.[12] Another serious helminthiasis is schistosomiasis. Untreated, urinary schistosomiasis can lead to the development of squamous cell carcinoma and intestinal schistosomiasis, to hepatosplenomegaly and portal hypertension.[11] Yet another significant helminth infection is filariasis, although its prevalence seems to have decreased since the introduction of mass treatment programmes.[13]

The aim of this paper is to describe the epidemiological characteristics of cases with eosinophilia and its association with the presence of parasites in the REDIVI data network.

Material and methods

This is a multicentre prospective observational study which includes patients diagnosed with eosinophilia registered in the cooperative network for the study of infectious diseases imported by travellers and immigrants (+REDIVI) from January 2009 to December 2012. This network collects data in a number of Spanish centres that enables us to identify and quantify the imported conditions, their geographical origin, the type of patient affected and the temporal patterns involved. These data cannot be linked to an individual because they are coded and each centre can only decrypt the information from the database for its own cases. The network was set up in January 2009 and is coordinated from Hospital Ramón y Cajal. In December 2012, it had 17 participating centres.

The variables to be studied were: gender, date of birth, country of birth, type of migration, country of origin/destination, date of arrival from the migration/travel process, duration of the trip, date of visit, reason for consultation and diagnosis. These data are mandatory for registration in the database, in addition to data on the clinical, epidemiological and disease process, according to a standardised protocol. Four forms of population movement were considered: immigrants; immigrants established in Spain visiting their country of birth (VFR: visiting friends and relatives); travellers; and VFR-travellers (children or spouses of immigrants born in Spain travelling to the country of their parents/partners). The definition of eosinophilia was that used at each of the participating centres to establish the diagnosis. This was because there is no standard definition for eosinophilia, and the range of parameters considered normal may vary from one centre to another. In addition, the reference figures used in Spanish hospitals do not conform to the biological parameters of certain populations (e.g. Sub-Saharan Africans). In general, the most commonly used figures were an absolute eosinophil count greater than 500/mm^3 or, in relative terms, greater than 7%.

The parasites responsible for eosinophilia were considered to be helminths and the protozoa *D. fragilis* and *C. belli*. The most commonly used protocol for the study of eosinophilia is shown in Table 1. Microscopic or serological techniques may vary from one centre to another depending on the available resources and the experience of each laboratory.

The study was approved by the ethics committee (IEC) of the Hospital Vall d'Hebron in Barcelona and was managed according to good clinical practice guidelines.

For the description of the data we used distribution measures, central tendency (mean or median if the standard deviation was >20%) and dispersion (standard deviation and interquartile range). Qualitative variables were compared using the chi-square test or Fisher's exact test for small samples. The risk analysis was calculated with prevalence ratios and their 95% confidence interval. Student's t test was used to compare continuous variables. SPSS version 21.00$^{\circledR}$ software was used to conduct the statistical analysis.