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ORIGINAL ARTICLE

Cystic fibrosis in adult age☆

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KEYWORDS
Cystic fibrosis;
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Abstract
Aim: To know the prevalence of the patients diagnosed of cystic fibrosis (CF) older than 18 years old of five specific Spanish Units and to analyze their clinical, genetic and microbiological characteristics.
Patients and methods: Observational, cross-sectional, descriptive study of patients diagnosed with CF at age or older than 18 years. The variables analyzed were: current age, age at diagnosis, sex, nationality, lung function parameters, pathologies presented at diagnosis, microbiological features and genetic findings.
Results: Eigthy nine patients (14.8% of the total of 600 CF patients followed at the participating units), of which 45 patients were female (50.6%) and 44 were males (49.4%), were included with a mean age at diagnosis of 36.4 years. Eigthy one patients (91%) were Spaniards. The sweat test was diagnostic in 77 (86.5%) of the patients studied. The sweat test was diagnostic in 77 of the 89 patients studied (86.5%). The most frequently detected mutations were F508*del*/other and G542X/other, and the most frequent clinical findings at diagnosis were the presence of bronchiectasis in 33 patients (37.1%) followed by sterility in 12 patients (13.5%). The most common colonizing organisms were meticillin-sensitive *Staphylococcus aureus* (*S. aureus*) (23.6%) and *Pseudomonas aeruginosa* (*P. aeruginosa*) (13.5%). Most patients presented a mild obstructive ventilatory defect and had no pancreatic involvement. The sweat test used to be indeterminate.
Conclusions: CF is also a disease which diagnosis can be in adulthood. CF patients diagnosed in adulthood have a mild lung function and lower incidence of pancreatic involvement, so their prognosis tends to be favorable.

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PALABRAS CLAVE
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Genética

Fibrosis quística diagnosticada en edad adulta

Resumen
Objetivo: Precisar la prevalencia de enfermos con fibrosis quística (FQ) diagnosticados en edades superiores a los 18 años y analizar sus características clínicas, genéticas y microbiológicas.
Pacientes y métodos: Estudio observacional, transversal y descriptivo de todos los pacientes diagnosticados de FQ a edad igual o superior a los 18 años. Las variables analizadas fueron: edad actual, edad al diagnóstico, sexo, nacionalidad, parámetros de función pulmonar, patologías presentes al momento del diagnóstico, características microbiológicas y hallazgos genéticos.
Resultados: Se incluyeron 89 pacientes (14,8%, del total de 600 pacientes en seguimiento en las unidades participantes), 45 mujeres (50,6%) y 44 varones (49,4%), con una edad media al diagnóstico de 36,4 años. Ochenta y un pacientes (91%) eran de nacionalidad española. La prueba del sudor fue diagnóstica en 77 de los 89 estudiados (86,5%). Las mutaciones detectadas con mayor frecuencia fueron la F508del/otra y la G542X/otra y los hallazgos clínicos más frecuentes en el momento del diagnóstico fueron las bronquiectasias en 33 pacientes (37,1%) y la esterilidad en 12 (13,5%). Los microorganismos colonizadores más frecuentes fueron *Staphylococcus aureus* (*S. aureus*) sensible a meticilina (23,6%) y *Pseudomonas aeruginosa* (*P. aeruginosa*) (13,5%). La mayoría de los pacientes presentaban una alteración ventilatoria obstructiva leve y no tenía afectación pancreática. La prueba del sudor con frecuencia ofreció resultados no concluyentes.
Conclusiones: La FQ es también una enfermedad de diagnóstico en la edad adulta. Los pacientes diagnosticados en edad adulta presentan una función pulmonar levemente alterada y una baja incidencia de afectación pancreática, por lo que su pronóstico tiende a ser favorable.

Background

Cystic fibrosis (CF) is the most common multisystem hereditary autosomal recessive disease in white people. CF can affect the digestive system, sweat glands and reproductive system, among other organs and systems. Its greatest morbidity and mortality is the result of the progressive deterioration of the respiratory system. Since the first published report by Andersen in 1938 on patients with CF,[1] at time when less than 50% of patients lived longer than 1 year, survival after diagnosis has clearly been steadily improving. Toward the 1960s, the median survival was 4 years. By 1990, the rate had increased to 28 years and currently exceeds 40 years.[1] The spectacular increase in life expectancy of these patients is the result of multiple factors that are essentially related to the implementation of specialized units and the use of new therapeutic modalities.[2–5] CF has thereby become a disease that is not exclusively pediatric but rather one that also affects adults, who present differential clinical manifestations, such as osteoporosis and diabetes mellitus.[6–11]

Progress in diagnostic techniques, with the inclusion of genetic tests, has led us to other atypical clinical forms of CF, which are frequently monosymptomatic and are present mainly in patients diagnosed in adulthood who frequently have negative or questionable results on sweat tests.[10,12] However, the sweat test can also give negative or uncertain results for adults with typical clinical forms of CF.[8,9,13] The main clinical forms of CF presentation are summarized in Table 1. Understanding the clinical characteristics of these new forms of presentation is important for establishing a diagnosis of suspected CF in adulthood.[8,10,14]

The main objective of this study was to determine the prevalence of patients with CF diagnosed after their 18th birthday. For the secondary objectives, we analyzed the reasons that motivated the referral to specialized CF units, the most common clinical characteristics presented by the patients at that time and the genetic mutations detected.

Patients and methods

Observational, cross-sectional descriptive study of all patients (18 years of age or older) diagnosed with CF, in 5 Spanish specialized units belonging to the hospitals La Paz (Madrid), Ramon y Cajal (Madrid), 12 de Octubre (Madrid), La Princesa (Madrid) and La Fe (Valencia) between March 1 and May 31, 2012. We analyzed all demographic characteristics, clinical manifestations associated with CF, genetic abnormalities, respiratory function and sputum microbiology of every individual at the time of the study. The CF diagnosis was established based on the presence of at least 1 clinical criterion or a family history of CF and the demonstration of abnormal functioning of the cystic fibrosis transmembrane conductance regulator (CFTR) by means of the sweat test results (chloride ion concentration in sweat) or the presence of 2 disease-causing mutations.[3,7] Data were extracted from each patient's medical records. The study followed the ethical research standards of the institutions participating in the study.

All patients underwent a genetic study that included the search for 47 mutations using the Immunogenetics test®, *Innolipa* CF-17, CF-19 and CFTR Deletions+6. In specific cases, when diagnostic questions remained after the initial