



## ORIGINAL ARTICLE

# Prevalence of exocrine pancreatic insufficiency in patients with chronic pancreatitis without follow-up. PANCR-EVOL Study<sup>☆</sup>



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### KEYWORDS

Complications;  
Nutritional status;  
Quality of life;  
Chronic pancreatitis;  
Fecal elastase-1;

### Abstract

**Background/objectives:** Exocrine pancreatic insufficiency (EPI) is an important complication of chronic pancreatitis (CP). Guidelines recommend to rule out EPI in CP, to detect those patients who would benefit from pancreatic enzyme replacement therapy. The aim of this study was to evaluate the prevalence of EPI in patients with CP without follow-up in the last 2 years and to describe their nutritional status and quality of life (QoL).

<sup>☆</sup> *Previous presentations:* Preliminary analysis has been successfully presented at the 47th Annual Meeting of the European Pancreatic Club, 24–26th of June 2015 in Toledo, Spain; at the XIV Meeting of the Spanish Pancreatic Club, 26–27th of June in Toledo, Spain, at the United European Gastroenterology Week, 24–28th of October 2015 in Barcelona, Spain. Final analysis has been successfully presented at the Sociedade Portuguesa de Gastroenterologia, 1st to 4th of June 2016, Algarve Portugal; at the LXXV Congress of the National Digestive Society 17–19th of June, 2016, in Santiago, Spain; 48th Annual Meeting of the European Pancreatic Club, 6–8th of June 2015 in Liverpool, United Kingdom and at the United European Gastroenterology Week, 15–19th of October, 2016. Vienna, Austria.

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Exocrine pancreatic insufficiency;  
Follow-up

**Methods:** This was a cross-sectional, multicenter Spanish study. CP patients without follow-up by a gastroenterologist or surgeon in at least 2 years were included. EPI was defined as fecal elastase test <200 mcg/g. For nutritional assessment, laboratory and anthropometric data were obtained. QoL was investigated using the EORTC QLQ-C30 questionnaire.

**Results:** 64 patients (mean age  $58.8 \pm 10.3$  years, 85.9% men) from 10 centers were included. Median time since diagnosis of CP was 58.7 months [37.7–95.4]. Forty-one patients (64.1%) had EPI. Regarding nutritional status, the following differences were observed (EPI vs. Non-EPI): BMI ( $23.9 \pm 3.5$  kg/m<sup>2</sup> vs.  $25.7 \pm 2.5$ ,  $p=0.03$ ); glucose (121 [96–189] mg/dL vs. 98 [90–116],  $p=0.006$ ); HbA1c 6.6% [6.0–8.4] vs. 5.5 [5.3–6.0],  $p=0.0005$ ); Vitamin A (0.44 mg/L [0.35–0.57] vs. 0.53 [0.47–0.63],  $p=0.048$ ) and Vitamin E ( $11.2 \pm 5.0$  µg/ml vs.  $14.4 \pm 4.3$ ,  $p=0.03$ ). EPI group showed a worse EORTC QLQ-C30 score on physical (93.3 [66.7–100] vs. 100 [93.3–100],  $p=0.048$ ) and cognitive function (100 [83.3–100] vs. 100 [100–100],  $p=0.04$ ).

**Conclusions:** Prevalence of EPI is high in patients with CP without follow-up. EPI group had higher levels of glucose, lower levels of vitamins A and E and worse QoL.

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## PALABRAS CLAVE

Complicaciones;  
Estado Nutricional;  
Calidad De Vida;  
Pancreatitis Crónica;  
Elastasa Fecal;  
Insuficiencia  
Pancreática Exocrina;  
Seguimiento

## Prevalencia de insuficiencia pancreática exocrina en pacientes con pancreatitis crónica sin seguimiento. Estudio PANCR-EVOL

### Resumen

**Antecedentes/objetivos:** la insuficiencia pancreática exocrina (IPE) es una importante complicación de la pancreatitis crónica (PC). Las guías recomiendan el seguimiento de la IPE en PC, para identificar a aquellos pacientes que puedan beneficiarse del tratamiento enzimático sustitutivo. El objetivo de este estudio fue evaluar la prevalencia de IPE en pacientes con PC sin seguimiento en los últimos 2 años y describir su estado nutricional y calidad de vida (QoL).

**Métodos:** estudio trasversal, multicéntrico, español. Se incluyeron pacientes con PC sin seguimiento por un gastroenterólogo/cirujano en los últimos 2 años. Se definió IPE como elastasa fecal <200mcg/g. Se recogieron parámetros de laboratorio y datos antropométricos para el análisis nutricional. Para la evaluación de QoL se utilizó el cuestionario EORTC QLQ-C30.

**Resultados:** se incluyeron prospectivamente 64 pacientes ( $58,8 \pm 10,3$  años, media 85,9%) de 10 centros. Tiempo medio desde el diagnóstico de PC: 58,7 meses [37,7-95,4]. 41 pacientes (64,1%) tenían IPE. Estado nutricional: se observaron las siguientes diferencias (IPE vs No-IPE): IMC ( $23,9 \pm 3,5$  kg/m<sup>2</sup> vs.  $25,7 \pm 2,5$ ,  $p=0,03$ ); glucosa 121 [96-189] mg/dL vs. 98 [90-116];  $p=0,006$ ); HbA1c 6,6% [6,0-8,4] vs. 5,5 [5,3-6,0],  $p=0,0005$ ); Vitamina-A (0,44 mg/L [0,35-0,57] vs. 0,53 [0,47-0,63],  $p=0,048$ ), Vitamina-E ( $11,2 \pm 5,0$  µg/ml vs.  $14,4 \pm 4,3$ ,  $p=0,03$ ). El grupo de IPE mostró una peor puntuación en el EORTC QLQ-C30 en las funciones física (93,3 [66,7-100] vs. 100 [93,3-100],  $p=0,048$ ) y cognitiva (100 [83,3-100] vs. 100 [100-100],  $p=0,04$ ).

**Conclusiones:** la prevalencia de IPE en pacientes con PC sin seguimiento es elevada. En el grupo de IPE se observaron niveles elevados de glucosa, bajos de vitaminas A y E y peor calidad de vida.

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## Introduction

Chronic pancreatitis (CP) is a syndrome characterized by inflammation, fibrosis and loss of acinar and pancreatic islet cells.<sup>1</sup> The amount of enzyme-rich fluid secreted by the pancreas is about 10 times the one needed to ensure a normal digestion. Thus, although subtle changes in exocrine function can be detected in patients with early pancreatic disease, overt steatorrhea as a manifestation of exocrine pancreatic insufficiency (EPI) does not occur until approximately 90 percent of glandular function has been lost.<sup>2</sup> According to the recommendations of the Spanish Association of Pancreatology, the term EPI should be only

used for the situation in which the alteration of pancreatic function is associated with the inability of the pancreas to perform a normal digestion process.<sup>3</sup>

Thirty percent of subjects with mild CP and 85% with severe CP will develop EPI 10–15 years after the beginning of the disease.<sup>4</sup> Advanced EPI results in maldigestion of fat and protein leading to steatorrhea and weight loss. Vitamins and minerals deficiencies may also appear due to malabsorption. EPI is associated with a worse quality of life in patients with CP.<sup>5</sup>

There is evidence that incidence of CP and CP-related hospitalizations is increasing.<sup>6</sup> Although the follow-up period for PC patients is not stabilised, the Spanish

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