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CONFLICTS OF INTEREST

None.

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Middle-aged woman with congestive symptoms: more than just pulmonary arterial hypertension

Mujer de mediana edad con síntomas congestivos, algo más que hipertensión arterial pulmonar

To the Editor,

We present the case of a 46-year-old woman who attended the emergency department with New York Heart Association (NYHA) class II-III dyspnea, dry cough, orthopnea, and generalized edema. Physical examination revealed bibasilar crackles and pitting edema in the lower limbs. Electrocardiography demonstrated sinus rhythm at 95 bpm and incomplete right bundle branch block. Chest radiography showed congestive signs, blood tests detected elevated natriuretic peptide levels, and focused cardiac ultrasound identified right heart dilatation. Computed tomography (CT) angiography of the pulmonary arteries ruled out a pulmonary thromboembolism and the patient was admitted to the cardiology department.

During hospitalization, the patient improved in response to diuretic therapy. A comprehensive echocardiogram showed right heart dilatation and signs of pulmonary arterial hypertension (PAH) (figure 1A). Right heart catheterization revealed a mean pulmonary artery pressure of 25 mmHg. The remaining parameters were normal and a vasoreactivity test was negative. Because pulmonary disease was ruled out using chest CT and spirometry, the PAH was classified as primary idiopathic PAH. The patient was discharged on sildenafil 20 mg/12 h and furosemide 40 mg/8 h.

Two months later, she was admitted with asthenia, anorexia, weight loss of 15 kg, and early satiety; notable findings included hemoglobin of 9 mg/dL, but no gastrointestinal bleeding. No cardiac decompensations had occurred since the previous hospitalization and the patient was free from edema and dyspnea at admission. A neoplastic condition was suspected. Abdominal CT demonstrated an increase in the thickness of the third duodenal portion and multiple mesenteric and retroperitoneal adenopathies, findings suggestive of lymphoma (figure 2A). Upper gastrointestinal endoscopy, colonoscopy, and positron emission tomography (PET)-CT were performed. Endoscopy showed a thickened, edematous, and friable duodenojejunal mucosa, with multiple lymphangiectasias and petechiae and ecchymosis in the biopsied tissue. The PET-CT revealed inflammatory or infectious findings of unclear significance (figure 2B). Intestinal biopsy demonstrated infiltration of the lamina propria by foamy histiocytes, which were stained by periodic acid-Schiff (PAS) stain, a finding compatible with Whipple disease (WD). Fecal polymerase chain reaction (PCR) was positive for *Tropheryma whipplei* (TW). Cerebrospinal fluid (CSF) analysis ruled out a central nervous system infection. Echocardiography performed to rule out cardiac diseases secondary to WD showed mobile vegetation, attached to the septal leaflet of the tricuspid valve, and severe tricuspid regurgitation, not present in the previous analysis, compatible with tricuspid endocarditis due to WD (figure 1B). Treatment was begun with ceftriaxone i.v. 2 g/24 h for 4 weeks and doxycycline 100 mg/12 h and hydroxychloroquine 200 mg/8 h for 1 year; the furosemide dosage was reduced to 40 mg/24 h and sildenafil was maintained at 20 mg/12 h.

Ambulatory care was selected with echocardiographic follow-up every 3 months (figure 1C). The dyspnea resolved and the patient experienced no cardiac decompensations. Her pulmonary pressure normalized, sildenafil was withdrawn, the furosemide was maintained at 40 mg/24 h, and the echocardiographic evidence of PAH abated. Her pro-brain natriuretic peptide (proBNP) level was 261 pg/mL. Echocardiography at 1 year of follow-up showed a tricuspid valve with a small hyperechogenic vegetation on the septal leaflet and persistence of the severe tricuspid regurgitation (figure 1D). The patient is currently asymptomatic and remains under follow-up. The patient's legal guardian signed informed consent for publication of the case.

WD is a rare disease caused by infection with TW that has an estimated prevalence of 0.1 to 1 cases/million.[1] Diagnosis is based on the presence of PAS-positive macrophages in histological samples of duodenal biopsies and on serological tests showing TW DNA in different tissues.[2]

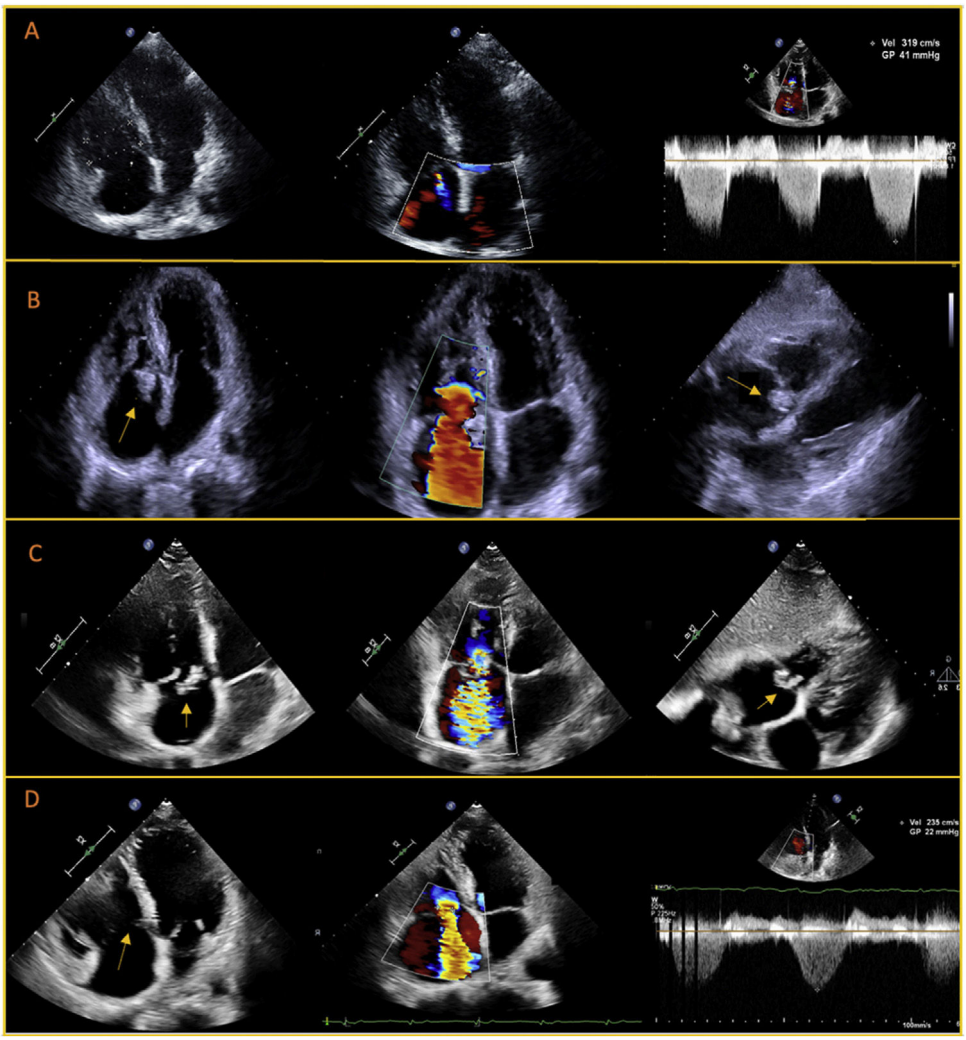

Figure 1. A: initial transthoracic echocardiography (TTE); right heart dilatation, tricuspid valve without vegetation, mild tricuspid regurgitation (TR), and elevated tricuspid regurgitation velocity as an indirect sign of pulmonary arterial hypertension. B: TTE after diagnosis of Whipple disease; vegetation on the septal leaflet of the tricuspid valve (arrows) and severe TR. C: follow-up TTE; reduced vegetation size (arrows). D: 1-year TTE, after treatment completion; retracted septal leaflet (arrow) with severe residual regurgitation and normal regurgitation velocity.

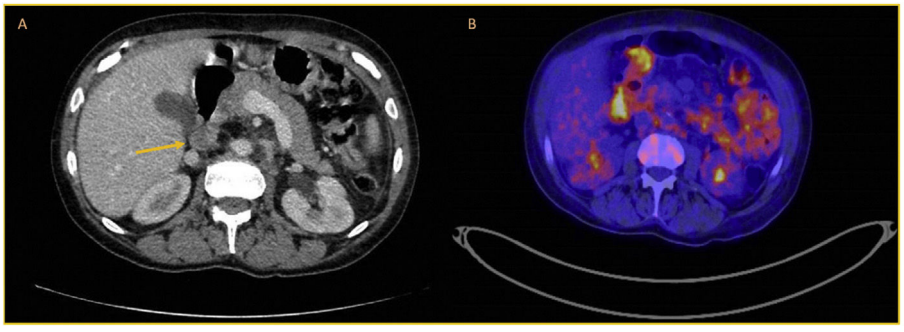

Figure 2. A: abdominal computed tomography; inflammation of the third duodenal portion. B: abdominal positron emission tomography; uptake in the loops of the small intestine.

WD usually presents as a triad of symptoms: fever, diarrhea, and joint pain. It can be accompanied by weight loss, chest pain, cardiac abnormalities, and manifestations affecting the central nervous system or any other organ.[1]

Infectious endocarditis (IE) is the most frequently associated cardiac condition,[1] and TW is isolated in 5% of cases of culture-negative IE.[3] The prevalence of TW-associated IE is low but its actual frequency may be higher, given that cases have been reported based on histological analysis or PCR of cardiac valves in patients not meeting the Duke criteria.[4] The most frequently affected valve is the mitral valve.[3] The etiological diagnosis of IE due to TW is conducted via biopsy or blood PCR.[5] Its treatment is based on antibiotic therapy with doxycycline 200 mg/24 h and hydroxychloroquine 200-600 mg/24 h for at least 18 months.[5]

In the lungs, this condition manifests as chronic cough, dyspnea, and pleuritic pain, similar to interstitial lung disease.[1] WD-associated PAH is an infrequent finding. Its pathophysiology has not been established but a proinflammatory state has been proposed, mediated by cytokines, direct infiltration of TW into the pulmonary vessels, or embolisms of PAS-positive cells.[2] In our patient, PAH was initially classified as group 1,[6] the changes over time in the echocardiographic parameters of the disease after antibiotic therapy led to its reclassification in group 5, as PAH with unclear and/or multifactorial mechanisms. No evidence is available on the management of pulmonary vascular disease caused by WD. However, most published cases of PAH reported resolution of PAH after antibiotic therapy, similar to what occurred in our patient. This observation supports the hypothesis of direct injury to the pulmonary vessels by the microorganism.

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AUTHORS' CONTRIBUTIONS

I. Gallo Fernández is the main author of the article. M. Delgado Ortega supervised the manuscript and the patient diagnosis. J. Perea Armijo and J. Rodríguez Nieto collaborated on the manuscript drafting. D. Pastor Wulf and J. López Baizán collaborated on the echocardiographic follow-up studies and figure preparation.

CONFLICTS OF INTEREST

None.

DECLARATION

The present case was selected for publication in *Revista Española de Cardiología* among those submitted to the 2023 edition of the League of Clinical Cases of the Spanish Society of Cardiology.

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Performance of an artificial intelligence chatbot with web search capability in cardiology-related assistance: a simulation study

Rendimiento de un chatbot de inteligencia artificial con capacidad de búsqueda web en asistencia relacionada con la cardiología: un estudio de simulación

To the Editor,

Cardiovascular disease is the leading cause of mortality worldwide. Early recognition and management of symptoms are crucial for improving outcomes. Approximately 70% of patients seek health information from search engines before consulting medical professionals.[1] Chat generative pretrained transfomer (ChatGPT), a dialogue-based artificial intelligence (AI) language model, was launched in November 2022, attracting widespread attention in the scientific community.[2] Microsoft's Bing-Chat, an AI-based chatbot that provides conversational assistance based on GPT-4, with access to real-time web searches (WSa-GPT), was released on February 8, 2023.[3] WSa-GPT uses natural language and deep learning algorithms to provide responses in the form of natural conversations. Although chatbots like ChatGPT have been shown to provide mostly accurate answers to basic questions related to cardiovascular disease prevention[4] and patient queries, and is also able to write discharge reports,[5] there is a need to assess their safety in aiding patients who consult them. The aim of this simulation study was to qualitatively evaluate the feasibility and accuracy of a WSa-GPT chatbot in providing cardiology-related assistance for common and significant cardiovascular conditions.

This study was conducted during the week of February 13 to 17, shortly after the launch of this WSa-GPT chatbot. We tested various prompts until we found one that effectively served as a health assistant. One cardiologist simulated 14 patients, based on experiences using a freestyle-like conversation that covered common and significant cardiovascular symptoms as well as emergent or banal conditions (table 1). The conversations were recorded, and 2 independent cardiologists assessed (as "appropriate" or "inappropriate") whether the anamnesis was thorough and relevant (matching the symptoms and responses, collecting relevant health history, symptoms, and risk factors in line with clinical guidelines). The 2 independent cardiologists also assessed