

Perfil de riesgo cardiovascular y rendimiento de modelos de inteligencia artificial para la detección de retinopatía diabética e hipertensiva en el Caribe Colombiano: un estudio transversal

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RESUMEN

La prevalencia de diabetes mellitus e hipertensión se encuentra en creciente aumento siendo importante determinar la características y métodos diagnósticos para valoración de los pacientes que presentan retinopatía diabética (RD) e hipertensiva (RH) para prevención de progresión de la enfermedad.

Métodos: Se realizó un estudio transversal descriptivo para identificar las características epidemiológicas y clínicas de pacientes con retinopatía hipertensiva y/o diabética de la consulta de retina de Centros Oftalmológicos del Caribe colombiano durante el periodo comprendido entre octubre del año 2017 y octubre del año 2019. La población quedó constituida por 219 pacientes. Se evaluó el desempeño diagnóstico de dos modelos de inteligencia artificial (IA) calculando certeza diagnóstica, sensibilidad y especificidad, comparándolo contra el patrón de oro (diagnóstico hecho por los Oftalmólogos), para establecer la presencia de retinopatía hipertensiva y/o diabética.

Resultados: En 219 pacientes evaluados, la RD y la RH se diagnosticaron en 72.6% y 63%, respectivamente; la RD proliferativa representó 33.3% y la RH grado II, 28.3%. La mayor frecuencia para ambas se observó en personas de 55–64 años. En la regresión logística, el sexo masculino ($p=0.0072$) y la cardiopatía isquémica ($p=0.0017$) se asociaron de forma independiente con presencia de RD.

El modelo de IA basado en Chat GPT versión 5.1 mostró alta certeza diagnóstica para RD (86.3%), sensibilidad del 90.6% y especificidad del 75%, mientras que su rendimiento para RH fue inferior (65.7%), sensibilidad 81.8% y especificidad 38.2%. El modelo de IA de basado en Gemini versión 2.0 mostró certeza diagnóstica para RD de 71.6%, sensibilidad del 92.4% y especificidad del 16.6%, mientras que su precisión para RH fue 63%, sensibilidad 92% y especificidad 13.5%.

Conclusiones: El tamizaje basado en IA del modelo Chat GPT v5.1 para retinopatía diabética tiene un destacado desempeño y podría mejorar la tasa de derivación de estos pacientes para manejo especializado. Su desempeño para RH es inferior. El modelo de IA Gemini v2.0 es deficiente para diagnosticar ambos tipos de retinopatía.

Palabras clave: Retinopatía diabética, retinopatía hipertensiva, fondo de ojo, inteligencia artificial.

ABSTRACT

The prevalence of diabetes mellitus and hypertension is increasing, making it important to determine the characteristics and diagnostic methods for evaluating patients with diabetic retinopathy (DR) and hypertensive retinopathy (HR) to prevent disease progression.

Methods: A cross-sectional study was conducted to identify the epidemiological and clinical characteristics of patients with hypertensive and/or diabetic retinopathy seen in retina clinics at ophthalmological centers in the Colombian Caribbean between October 2017 and October 2019. The study population consisted of 219 patients. The diagnostic performance of two artificial intelligence (AI) models was evaluated by calculating diagnostic accuracy, sensitivity, and specificity, comparing them against the gold standard (diagnosis by ophthalmologists) to establish the presence of hypertensive and/or diabetic retinopathy.

Results: In 219 patients evaluated, diabetic retinopathy (DR) and hypertensive retinopathy (HR) were diagnosed in 72.6% and 63%, respectively; proliferative DR accounted for 33.3% and grade II HR for 28.3%. The highest frequency for both was observed in individuals aged 55–64 years. In the logistic regression analysis, male sex ($p=0.0072$) and ischemic heart disease ($p=0.0017$) were independently associated with the presence of DR.

The AI model based on Chat GPT v5.1 showed high diagnostic accuracy for DR (86.3%), sensitivity of 90.6%, and specificity of 75%, while its performance for HR was lower (65.7%), sensitivity of 81.8%, and specificity 38.2%.

The AI model based on Gemini v2.0 showed diagnostic accuracy for diabetic retinopathy (DR) of 71.6%, sensitivity of 92.4%, and specificity of 16.6%, while its accuracy for hypertensive retinopathy (HR) was 63%, sensitivity of 92%, and specificity of 13.5%.

Conclusions: The AI-based screening of the Chat GPT v5.1 model for diabetic retinopathy performs well and could improve the referral rate of these patients for specialized management. Its performance for HR is lower. The Gemini v2.0 AI model is inadequate for diagnosing both types of retinopathies.

Keywords: Diabetic retinopathy, hypertensive retinopathy, fundus examination, artificial intelligence.

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