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Editorial

# The Inevitable Advent of Artificial Intelligence for Aiding the Diagnosis of Eye Disease

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Without any doubt, computer science is nowadays the most rapidly growing field in human development. Today, most ordinary human activities are inconceivable without the help of an electronic device like a cellular phone, an electronic tablet, a laptop computer, or any other gadget. Medicine is not the exception, particularly in ophthalmology, which is a field of images and diagnostic devices from single digital cameras, to most sophisticated multimodal imaging technologies [1,2]. In the almost two decades of the present century, we ophthalmologists have radically changed our way of diagnosing and treat many ocular conditions based on computerized technological advancements. From more accurate and sensitive diagnostic equipment for analyzing the cornea like corneal topography-tomography to multimodal imaging devices that capture thousands of image frames per second of the retina, such as the swept source optical coherence tomography, which is capable of reproducing the retinal layers almost to a histologic level [3]. All these instruments have revolutionized the way we diagnose eye diseases. Moreover, as this technologic field rapidly progress, we are capturing thousands of normal and pathologic images from many different ocular structures which after being analyzed, get stored along with their graphic, diagram patterns, and numerical data in the diagnostic equipment and the patient electronic medical records. Those images and datasets may be fed to computers for machine learning and processing.

We traditionally have used the patient´s medical history, a direct interrogation of symptoms and signs, the physical examination, and auxiliary tools like laboratory tests and imaging analysis to find the cause of present illness. We tie the results from all these conventional methods with specific diagnostic criteria for increasing the sensitivity and specificity of disease diagnosis. Artificial intelligence (AI) has the infinite capacity of assisting us by shortening this process, and at the same time, improving the patient quality of care in clinical practice [4]. AI can diagnose a disease based on complex algorithms using thousands of medical notes from electronic medical records, lab tests, and imaging results recorded from an infinite number of patients, and couple them with established diagnostic criteria. AI may also improve the sensitivity and specificity of disease diagnosis significantly. In the field of ophthalmology, machine learning has already been applied to systematic identification and diagnosis of different ocular pathologies, including diabetic retinopathy, age-related macular degeneration, glaucoma, and keratoconus, among others [5-8].

So, we are in the advent of a radical change in paradigms of diagnosis methodology in all medical fields, including ophthalmology. As clinicians, we can be an active part of the change by contributing to machine learning by providing diagnostic clinical datasets or even further, by getting involved in research development to find out which are the best methods of deep learning and conventional machine learning analysis.

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