

Artificial intelligence in glaucoma

*Megha Nair, Shivraj Tagare, Rengaraj Venkatesh,
Annamalai Odayappan*

Aravind Eye Hospital, Puducherry, India

Abstract

Background: Artificial Intelligence (AI) is an area of computer science that encompasses the creation of intelligent machines that work and react like humans. It deals with the development algorithms that seek to simulate human brain and also mimic cognitive functions typically associated with the human mind such as learning and problem solving. **Purpose:** Do we need artificial intelligence in Glaucoma? Glaucoma is the second most common cause of blindness in the world. Its prevalence was over 60 million in 2010 and over 80 million by 2020. It is so common, yet so easily overlooked. More importantly, about 50% of patients in developed countries and 90% in developing countries are unaware of having glaucoma. Early detection can delay the progression of glaucoma. Hence the time is ripe to advocate glaucoma screening. **Synopsis:** The application of AI in ophthalmology mainly concentrates on the diseases with a high incidence, such as diabetic retinopathy, age-related macular degeneration, glaucoma, retinopathy of prematurity, age-related or congenital cataract etc AI involves mainly 1. machine learning that are algorithms with the ability to learn without being explicitly programmed and 2. deep learning in which

artificial neural networks adapt and learn from vast amounts of data. But there are limitations to screening - such as disparity between ophthalmologist:patient ratio and also the availability of the specialty services. The large amount of data acquired from patients makes it nearly impossible for ophthalmologists to screen them with equal efficacy and consistency. **Highlights:** AI in glaucoma aims at including factors such as clinical data, genomic data, life style behaviors, risk factors, and medical history to predict the risk of developing glaucoma, help customise the most appropriate management protocol for a given patient, and estimate prognosis and surgical success. **Video Link:** <https://youtu.be/IwYS7wDMhkY>

Key words: artificial intelligence, glaucoma, screening, machine learning, deep learning

Correspondence: Megha Nair, Aravind Eye Hospital, Puducherry, India; email: megnair@gmail.com

DOI: 10.4103/ijo.IJO_1015_22 **PMID:** *****