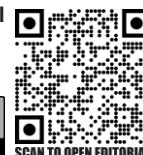


Artificial Intelligence in Ophthalmology: Replacement or Augmentation

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Artificial intelligence (AI) has speedily established itself at the forefront of modern ophthalmology practice. It has proven to be matchless when it comes to analyzing large data with uneasy patterns subsequently giving an insight.¹ But does artificial intelligence performs comparable to or even exceeds the clinician's efficacy in completion of specific tasks? The answer to this question is not an easy one and will raise further questions as to whether artificial intelligence is able to replace ophthalmologists in clinical practice?

Artificial intelligence has demonstrated maximum utility in imaging based ophthalmic specialties. Its learning algorithms have proven to be very accurate in diagnosing and staging diabetic retinopathy, age related macular degeneration and even glaucoma with the aid of optical coherence tomography and fundus photography. However, in simple and clear cut tasks the AI softwares usually excel but when it comes to clinical correlation with a real time scenario AI is not free of limitations. This gap presents a challenge of correctly interpreting heterogeneous data and workflow integration.

Moreover, the spectrum of ophthalmology practice like other specialties extends beyond merely interpreting data and involves patient communication and devising personalized management plan. These are the capabilities which the most advanced AI systems still lack and human oversight is required for patient safety and ethical treatment.³

So the evidence is strongly suggestive of AI-Human collaboration rather than competition. In such a setting AI can help in flagging high risk patients and reducing diagnostic errors. Likewise, workflows can be streamlined thus reducing the burden on clinicians. In under developed countries like Pakistan, AI can act as screening tool at places where human resource is less. However, such integration is not without its challenges of data interpretation quality and bias. Additionally, economic status is a major factor in AI integration. On one hand, AI integration into healthcare may reduce huge amount of healthcare costs in long run but initial startup, training and maintenance is also a significant financial burden.

The impact of AI also depends on how one integrates it with clinical practice for improved patient safety and health promotion. Despite the limitations, AI is predicted to transform and shape the future of clinical ophthalmology by integration and not competition. The future of ophthalmology lies not in choosing between human and artificial intelligence, but in harnessing the synergy between the two.

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