Integration of Large Language Models as an Adjunct Tool in Healthcare

Letter to the Editor

Himel Mondal

All India Institute of Medical Sciences, Department of Physiology, Jharkhand, India

Dear Editor,

I read with great interest the recent article titled "Evaluating the Performance of ChatGPT, Gemini, and Bing Compared with Resident Surgeons in the Otorhinolaryngology In-service Training Examination" published in your journal (1). The study offers valuable insights into the evolving role of large language model (LLM) in healthcare.

The study's comparative evaluation of Artificial intelligence (AI)-driven language models with resident surgeons is both timely and significant. It highlights the fact that while LLMs, such as ChatGPT and Gemini, exhibit impressive capabilities in answering factual and guideline-based questions. However, they are still far from replacing human expertise (2), especially in highly specialized fields like otorhinolaryngology. The complexity involved in medical decision-making require not only the recall of information but also the ability to apply it in context, an area where general-purpose LLMs like ChatGPT remain limited as it depends on the input (3).

While these tools excel at providing broad and evidence-based responses, they often struggle with the subtleties of case-specific clinical reasoning (4). A summary of potential difference between the LLM and human in various aspect of healthcare is shown in Table 1. Usage of LLMs is an adjunct tool rather than replacements in healthcare education and clinical practice (5). By supporting residents in understanding core concepts, reviewing evidence-based guidelines, or simulating basic diagnostic scenarios, LLMs can serve as a valuable supplementary resource in training environments. However, the integration of AI into medical education and diagnostics must be approached with caution. AI is still some way from being able to reliably make critical healthcare decisions independently. Hence, the use of AI tools should be geared toward enhancing human decision-making rather than substituting it.

ORCID ID of the author:
H. M. 0000-0001-6950-5857

Cite this article as: *Mondal H. Integration of large language models as an adjunct tool in healthcare. Turk Arch Otorhinolaryngol. 2024; 62(3): 174-175*

Corresponding Author:
Himel Mondal;
himelmkcg@gmail.com

Received Date: 25.10.2024
Accepted Date: 26.11.2024
Epub: 27.03.2025
Publication Date: 28.03.2025

DOI: 10.4274/tao.2024.2024-10-11

Table 1. Comparative characteristics and capabilities of large language model and human in healthcare

Capability	Large language models	Humans (healthcare professionals)
Knowledge base	Vast, up-to-date knowledge from various medical sources	Extensive, based on education, experience, and continuous learning
Speed of information retrieval	Instant access to large databases of medical knowledge	Slower, relies on memory and manual searching in guidelines or literature
Pattern recognition	Can quickly identify patterns from large datasets	Relies on experience and intuition, better at recognizing subtle, complex cues
Accuracy of diagnosis	Dependent on data quality and training	Typically, higher in complex or ambiguous cases due to clinical judgment
Contextual understanding	May struggle with nuanced patient context (e.g., social, emotional factors)	Rich understanding of patient context, holistic assessment
Handling uncertainty	May provide probabilistic answers, lacks real-world situational judgment	Can navigate uncertainty with experience and clinical reasoning
Ethical decision making	Follows predefined ethical guidelines, no moral reasoning	Uses professional judgment to make complex ethical decisions
Personalization	Limited ability to tailor advice to individual lifestyles or preferences	Highly personalized care based on individual patient histories, preferences, and values
Continuous learning	Can be updated with new data, faster	Constant learning through practice, research, and professional development, slower
Creativity in problem-solving	Limited to predefined algorithms and data	Can innovate, adapt, and think creatively in complex situations
Communication skills	Provides clear, factual, but impersonal communication	Communicates with empathetic way with patients and colleagues
Legal accountability	No legal responsibility, tools to assist but not autonomous	Legally accountable for decisions and patient outcomes
Handling rare/unseen cases	May provide incorrect or incomplete information due to lack of specific data	Can seek further expertise or explore innovative solutions for rare conditions
Adaptation to new research	Dependent on updates and retraining	Continuous adaptation to new research through clinical practice and guidelines

Footnotes

Financial Disclosure: The author declared that this study received no financial support.

References

1. Mete U. Evaluating the performance of chatgpt, gemini, and bing compared with resident surgeons in the otorhinolaryngology ın-service training examination. Turk Arch Otorhinolaryngol. 2024; 23: 6248-57. [Crossref]
2. Homolak J. Opportunities and risks of ChatGPT in medicine, science, and academic publishing: a modern Promethean dilemma. Croat Med J. 2023; 28: 64:1-3. [Crossref]
3. Yuan M, Bao P, Yuan J, Shen Y, Chen Z, Xie Y, et al. Large language models illuminate a progressive pathway to artificial intelligent healthcare assistant. Medicine Plus 2024; 1: 100020. [Crossref]
4. Meng X, Yan X, Zhang K, Liu D, Cui X, Yang Y, et al. The application of large language models in medicine: A scoping review. iScience 2024; 23: 109713. [Crossref]
5. Ullah E, Parwani A, Baig MM, Singh R. Challenges and barriers of using large language models (LLM) such as ChatGPT for diagnostic medicine with a focus on digital pathology - a recent scoping review. Diagn Pathol. 2024; 27: 19: 43. [Crossref]