Pros and Cons of ChatGPT in Medical Oncology - Comprehensive Review of Available Literature

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Abstract

This article explores the prospects and challenges associated with the integration of ChatGPT, an AI-powered language model, in the field of medical oncology. ChatGPT offers numerous advantages, including efficient information retrieval, assistance in diagnosis and treatment planning, 24/7 availability, cost-effectiveness, continual learning, and patient education. However, it also presents limitations such as a limited understanding of context, the risk of inaccurate information, a lack of human touch and empathy, liability and ethical concerns, dependence on technical infrastructure, and the potential for unintended bias. Striking a balance between technology and human expertise is crucial for the successful implementation of ChatGPT in medical oncology, allowing us to harness its benefits while addressing its limitations to advance cancer care and improve patient outcomes.

1. Introduction

In recent years, artificial intelligence (AI) has been rapidly advancing, leading to breakthroughs in various fields, including healthcare. One area where AI is showing great potential is in medical oncology, where the use of AI-powered language models

like ChatGPT can significantly impact patient care and research. ChatGPT is a powerful language model developed by OpenAI, capable of generating human-like text based on the input it receives. In this article, we will explore the pros and cons of using ChatGPT in medical oncology to better understand the benefits and potential challenges associated with its implementation.

2. Pros of Using ChatGPT in Medical Oncology

1. **Enhanced Efficiency in Information Retrieval**: ChatGPT can rapidly process vast amounts of medical literature and research papers, providing healthcare professionals with relevant information at their fingertips. This efficient information retrieval can aid in clinical decision-making, research, and treatment planning, saving precious time for oncologists [1]. It can help surface the most relevant data in terms of the combination of biomarkers that can be utilized for better targeted therapy.

2. **Assistance in Diagnosis and Treatment Planning**: ChatGPT can act as a virtual assistant, providing insights into complex cases and helping oncologists arrive at accurate diagnoses and personalized treatment plans. By analyzing patient data, medical history, and current symptoms, ChatGPT can offer valuable recommendations based on the latest research and clinical guidelines. During tumor boards, oncologists can obtain information in real time to make informed decisions tailored to the clinical case scenario at hand and not just rely on encyclopedic knowledge.

3. **24/7 Availability**: Unlike human professionals, ChatGPT can be accessed at any time of the day or night. This constant availability can be beneficial in emergencies or for patients seeking immediate guidance regarding their condition or treatment options.

4. **Cost-Effectiveness**: Implementing ChatGPT in medical oncology could reduce costs associated with medical consultations and resource allocation. Patients may find it more affordable to interact with AI-powered systems, and healthcare facilities can optimize their staff's time by delegating repetitive tasks to the AI model [2].

5. **Continual Learning and Improvement**: AI models like ChatGPT continuously learn and improve from user interactions and feedback. As more oncologists and researchers use the system, it can adapt to the latest medical advancements and ensure the information it provides remains up-to-date and accurate.

6. **Patient Education and Empowerment**: ChatGPT can be utilized to educate patients about their condition, treatment options, and potential side effects. Informed patients are more likely to actively participate in their treatment journey, leading to better treatment adherence and overall outcomes [3-5]. ChatGPT has been seen to provide recommendations in line with current guidelines when asked about preventive strategies and screening recommendations for various types of cancer, such as breast lung cancer and colorectal cancer [6].

3. Cons of Using ChatGPT in Medical Oncology

1. **Limited Understanding of Context**: While ChatGPT is a sophisticated language model, it lacks a deep understanding of the context and nuances in medical information. Misinterpretations or incomplete responses may occur, potentially leading to incorrect advice or treatment recommendations. ChatGPT's performance has been found lacking in certain studies when it comes to providing up to date cancer treatment recommendations based on NCCN guidelines [7].

2. **Risk of Inaccurate Information**: The accuracy of ChatGPT's responses heavily relies on the quality and accuracy of the data it was trained on. If the model was exposed to biased or outdated information during its training phase, it may provide inaccurate or harmful recommendations [8].

3. **Lack of Human Touch and Empathy**: AI-powered systems lack the human touch and empathy that patients often seek from healthcare professionals. For some patients, discussing sensitive issues or emotionally challenging topics with an AI model may feel impersonal and unsatisfactory.

4. **Liability and Ethical Concerns**: Implementing AI in medical settings raises liability and ethical concerns. In cases of misdiagnosis or improper advice, determining responsibility could be complex. Ensuring patient privacy and data security is also crucial when dealing with sensitive medical information.

5. **Dependence on Technical Infrastructure**: ChatGPT and other AI systems require robust technical infrastructure to operate effectively. If the system experiences downtime or technical issues, it could disrupt medical services and lead to delays in patient care.

6. **Unintended Bias**: AI models, including ChatGPT, can inadvertently perpetuate biases present in the data used to train them. If not carefully monitored and addressed, this could lead to biased treatment recommendations, disproportionately impacting certain patient groups.

4. Conclusion

The integration of ChatGPT in medical oncology presents both promising advantages and potential challenges. By harnessing the power of AI, oncologists can access vast amounts of medical knowledge and receive valuable insights into patient care and treatment. However, it is essential to address the limitations, such as potential inaccuracies, ethical concerns, and lack of human touch. To ensure the successful implementation of ChatGPT and similar AI technologies in medical oncology, continuous improvement, careful monitoring, and collaboration between AI developers, oncologists, and other healthcare professionals are vital. By striking a balance between technology and human expertise, we can leverage the benefits of AI to advance cancer care.

REFERENCES

1. Blum J, Menta AK, Zhao X, et al. Pearls and pitfalls of ChatGPT in medical oncology. Trends Cancer. 2023;9(10):788-90.

2. Khanna NN, Maindarkar MA, Viswanathan V, et al. Economics of Artificial Intelligence in Healthcare: Diagnosis vs. Treatment. Healthcare (Basel). 2022;10(12):2493.

3. Hopkins AM, Logan JM, Kichenadasse G, et al. Artificial intelligence chatbots will revolutionize how cancer patients access information: ChatGPT represents a paradigm-shift. JNCI Cancer Spectr. 2023;7(2):pkad010.

4. Yeo YH, Samaan JS, Ng WH, et al. Assessing the performance of ChatGPT in answering questions regarding cirrhosis and hepatocellular carcinoma. Clin Mol Hepatol. 2023;29(3):721-32.

5. Young JN, Ross O'Hagan, Poplausky D, et al. The utility of ChatGPT in generating patient-facing and clinical responses for melanoma. J Am Acad Dermatol. 2023;89(3):602-04.

6. Kassab J, Nasr L, Gebrael G, et al. AI-based online chat and the future of oncology care: a promising technology or a solution in search of a problem? Front Oncol. 2023;13:1176617.

7. Chen S, Kann BH, Foote MB, et al. Use of Artificial Intelligence Chatbots for Cancer Treatment Information. JAMA Oncol. 2023;9(10):1459-62.

8. Yeo YH, Samaan JS, Ng WH, et al. Assessing the performance of ChatGPT in answering questions regarding cirrhosis and hepatocellular carcinoma. Clin Mol Hepatol. 2023;29(3):721-32.